THE NAME OF THE UNIT BEING EVALUATED:
Faculty of Electrical Engineering

FORD: 2. Engineering and Technology

SOCIAL CONTRIBUTION OF THE EVALUATED UNIT

3.1 Introductory information about the unit under evaluation

The evaluated unit will describe its mission and vision and provide a general self-reflection of the societal contribution of R&D&I, along with its long-term goals in the fields it develops. The distribution of research activities by type of research will also be commented on.[1] The evaluated unit will describe its organisational structure and size (staffing, number of students, number of study programmes implemented, etc.) based on the data provided in annex tables 3.1.1 to 3.1.6.

Maximum 1000 words.

This is a non-rated indicator that serves as an introduction to the evaluated unit, providing context for data in indicators 3.2-3.7.

Self-assessment: The Faculty of Electrical Engineering of the CTU in Prague (FEE) is a key educational and scientific research institution in the field of electrical engineering, computer science and robotics and related areas in the Czech Republic. Its **mission** is to prepare top professionals, to develop excellence in scientific knowledge, to apply innovative technologies and support the community and the government in order to contribute to the development of the society and the industry, both at the national and international level.

The **vision** of FEE is to be an internationally-recognised institution of excellence in education and research. FEE **aspires** to be the first choice for students, researchers and industrial partners looking for quality in education and for innovative solutions to the current challenges.

FEE affects the society via **extensive cooperation** with **high-tech companies**, by collaborative projects as well as joint laboratories e.g. with Avast, CRRC, Rohde & Schwarz, and Toyota, which are located on faculty premises. Faculty R&D contributes to **projects** responding to the needs of the **government**, especially **health, security** and **defence institutions**. FEE also participates in space research projects and receives funding from foreign grant agencies, including DARPA. During the monitored period, we completed **international** and **domestic grant-funded projects** in basic and applied research, including European structural fund projects, totalling CZK 1,874 million/EUR 74 million. FEE is a sought-after partner for industry: the **annual income** from **contract research** increased from EUR 2.4 million to EUR 3.8 million in the 2019-2023 period, reaching EUR 14.1 million.

FEE contributes to society by educating **highly skilled professionals** in **Electrical Engineering (EE)**, **Computer Science (CS)** as well as in Software Engineering, Biomedical Engineering and Space and Aeronautical Engineering. In 2022, a survey among FEE graduates found that only one of 348 graduates had been looking for work for more than 8 months, at the time of the survey there was

[1] Basic, applied, contract, artistic research (see Definition of Terms in Methodology HEI2025+).

not a single respondent unemployed. A dominant majority of graduates (87 %) are satisfied with what FEE has provided towards preparing for employment. According to the survey, the average starting salary in the first job was EUR 2,100, which was 1.5 times the national average in 2019, and after getting settled at work, the respondents received an average of EUR 3,200, double the national average in 2023.

The strategic goals are driven by the **FEE key values**:

- People come first.
- Quality in all faculty roles, in all aspects of our activities.
- Collaboration - we compete with the world, not with each other.
- Openness to the world and to new disciplines.
- The strength of FEE is the strength of CTU, the strength of CTU is the strength of FEE.
- We make decisions by consensus and with transparency.
- We always consider the ethical dimension of our actions.
- We respect and promote the principles of sustainable development, societal needs, and the protection of nature and the planet.

The **strategic long-term goals**, listed below, include seven areas. The first four address the roles of a modern university and the other three are seen as supportive without which the quality of the activities of the first four roles cannot be developed. In line with the FEE key values, we strive to achieve high quality in all aspects of our activities by which we support and develop society and the world in which we live, and we must not stumble on any of these four "legs". Area 5 turns inward and concerns the quality management of the faculty and its human resources. Area 6, a comfortable environment for study and work, is both a goal and a means. The final area, 7, is public relations. The impact of faculty that the community knows about often opens up new opportunities and inwardly creates a sense of justified pride in the institution we work in and build.

1. **Ensure excellence in education** - to provide modern and practice-oriented study programmes, to expand cooperation with industry and supporting international mobility of students and academics.

2. **Foster scientific excellence and interdisciplinary collaboration** - to promote cutting-edge research in key areas, to win prestigious grants, and to develop collaborations with research institutions at home and abroad.

3. **Promote innovation and technology transfer** - to strengthen links between academia and industry, to establish spin-off companies and encourage entrepreneurship among students and staff.

4. **Support society, community, government** - to support decision-making of government bodies, activities of secondary schools, third age education, technical education in general.

5. **Quality of faculty management and human resources policy** - to strengthen the quality and efficiency of management activities, to support for human resources development, including gender aspects and reconciliation of professional and personal life

6. **Comfortable environment for study and work** - to support for efficient use of space and improvement of facilities, to create zones for self-study and rest, support for student activities and staff needs

7. **Open and clear public relations** - to communicate a complete, true and comprehensible picture of all roles and activities of the faculty, to promote the importance of technical education, to develop and build relationships with all relevant target groups, both external and internal (prospective students, employees, alumni, lay and professional public, government and private entities) for mutual benefit in the long term

FEE is **one of the most important** research institutions in the Czech Republic. It has been contributing approximately 1/3 to the overall research output of the CTU, measured by the number of quality publications and the number of citations. In particular, predominantly due to FEEs scientific output,

the **QS World Rankings**, in both **Computer Science** and **Electrical Engineering** (CS & EE), have consistently placed CTU within the 151th to 250th range.

FEE supports and develops **basic** and **applied research and development** in the field of **EE and CS** with overlaps into **natural, medical, economic** and **humanities sciences**: Aeronautical and Space, Biomedical, and Power Engineering; Acoustics, Applied physics, Automation Control; Cybernetics; Computer Science; Graphics; History of Science, Management and Energy Economics; Mathematics; Material Science, Microelectronics; Radioengineering; Robotics; and Telecommunication.

FEE **commercialises research** through the sale of patent licences, support for start-up companies and partnerships with leading industrial companies.

FEE **intensively popularizes science and research**. From 2019 to 2023, we registered over **7 700 media appearances** of our academic staff on TV, radio, in the press, and on the Internet.

In 2023, at the end of the reporting period, the FEE had the following **structure** and **size**:

- Departments: The faculty consists of 17 departments with 200+ doctoral advisors
- Staff (FTE, annual report 2023): Approximately 442 academic and research staff members including 51 professors, 73 associated professors, 104 assistant professors, 2 assistants, 36 lecturers, 176 researchers including 22 postdocs, supported by 135 administrative and technical staff.
- Students: 3,251 students, including 1,960 bachelor, 855 master, and 436 doctoral students in present form.
- Study Programs: 9 bachelor and 13 master degree programs. One bachelor's and 6 master's degree programs of the above were taught only in English.

Table 3.1.1 - Staffing per FTE[2]

Academic/ Professional position	Total / Of which women					
	2019	2020	2021	2022	2023	Total
Professor	47.4/2.2	48.2/2	49.2/2	51.7/2	50.7/2	247.4/10.2
Associate Professor	66.8/3	69.2/3	72.1/3	72.6/3	73.3/3	353.9/15
Assistant Professor	114.8/14.1	114.4/13.6	109.6/11.6	106.3/11.6	104.3/11.6	549.3/62.7
Assistant	1.4/0	1.4/0	1.2/0	1.2/0	2/0	7.2/0
R&D Personnel[3]	89.5/13.9	87.1/14.6	80/10	92.5/18	99.1/22.2	448.1/78.7
Researchers in other categories[4]	194.9/16.6	199.6/15.9	216.1/17.1	218.9/22.9	229.6/29.2	1059.2/101.7
Technical and economic staff[5]	141.3/106.9	143.1/105	138/102.3	132/96.9	134.7/103	689.2/514.1

[2] The average number of hours worked is calculated as the ratio of the total number of hours actually worked during the reference period, from 1 January to 31 December, by all staff (including agreement on work activity, excluding agreement on work performance) to the total annual working time pool per full-time employee. The full- time status of the worker in the evaluated unit is always reported. If an employee holds more than one type of full-time job within the evaluated unit, the total sum of the two shall be reported.

[3] The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

[4] The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

[5] Who participates in the management and support of R&D&I in the institution.

Scientific, research and development staff involved in teaching activities	231.4/19.3	234.2/18.6	233.1/16.6	232.8/16.6	231.3/16.6	1162.8/87.9
Early career researchers[6]	113.8/7.3	118.8/7.2	126.3/6.9	129.2/7.9	132.6/9.1	620.7/38.4
post-docs[7]	18.1	23.9	31.7	31.1	21.7	126.5
Total[8]	656.1/156.7	663/154.2	666.2/146.1	675.2/154.4	693.7/171	3354.2/782.3

Note: The categories professor, associate professor, assistant professor, assistant, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

3.1.2 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2019 (numbers of physical employees and personnel)[9]

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Professor	0	0	0	0	12	0	15	0	18	2	15	1
Associate Professor	0	0	10	1	30	1	14	1	14	0	8	0
Assistant Professor	2	0	53	3	48	7	21	4	17	4	0	0
Assistant	0	0	3	0	0	0	0	0	0	0	0	0
R&D Personnel[10]	18	4	34	4	34	6	18	2	13	2	10	1
Researchers in other categories[11]	129	14	135	8	37	2	8	0	4	1	1	0
Technical and economic staff[12]	6	0	11	2	3	1	0	0	0	0	0	0
Scientific, research and development staff involved in teaching activities	2	0	67	4	90	8	50	5	49	6	23	1
Early career researcher[13]	19	0	126	7	9	2	1	1	0	0	0	0
Total[14]	155	18	246	18	164	17	76	7	66	9	34	2

[6] See Definition of Terms in Methodology HEI2025+.
[7] PhD outside CTU, and less than 6 years after PhD
[8] Total is the sum of the categories: professor, associate professor, assistant professor, assistant, R&D personnel, researchers in other categories and technical and economic staff.
[9] The total number of employees/workers as of 31st December of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.
[10] The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).
[11] The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).
[12] Who participates in the management and support of R&D&I in the institution.
[13] See Definition of Terms in Methodology HEI2025+.
[14] Total is the sum of the categories: professor, associate professor, assistant professor, assistant, R&I Personnel, Researchers in other categories and technical and economic staff.

Note: The categories professor, associate professor, assistant professor, assistant, other scientific, R&D Personnel, Researchers in other categories and Technical and economic staff are mutually exclusive, i.e. one staff member is reported in only one category. The categories of scientific, research and development staff involved in teaching activities and early career researchers are reported collectively for all the above-mentioned categories.

3.1.3 Age structure of R&D&I personnel of the evaluated unit and their structure by job title and gender in the year 2023 (numbers of physical employees and personnel)[15]

Academic/ professional position	Under 29 years		30-39 years old		40-49 years old		50-59 years old		60-69 years old		70 years and older	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Professor	0	0	0	0	8	0	14	0	18	1	23	1
Associate Professor	0	0	3	0	38	2	21	1	9	0	11	0
Assistant Professor	0	0	18	0	64	6	20	2	16	6	7	1
Assistant	0	0	2	0	1	0	0	0	0	0	0	0
R&D Personnel[16]	25	11	29	3	24	9	31	6	15	0	9	1
Researchers in other categories[17]	130	18	146	15	64	7	12	1	4	1	1	0
Technical and economic staff[18]	1	0	9	1	1	0	1	0	0	0	0	0
Scientific, research and development staff involved in teaching activities	0	0	23	0	112	8	55	3	43	7	41	2
Early career researcher[19]	13	2	146	9	15	0	1	0	1	0	0	0
Total[20]	156	29	207	19	200	24	99	10	62	8	51	3

Note: The categories professor, associate professor, assistant professor, assistant, other scientific, R&D personnel, researchers in other categories and technical and economic staff are mutually exclusive, i.e. one staff member is reported under one category only. Scientific, research and development staff involved in teaching activities, as well as early career researchers are reported collectively for all the above-mentioned categories.

Table 3.1.4 – Students

Type of study	2019		2020		2021		2022		2023		Total	
	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women	Total	Women
Undergraduate	1729	254	1838	263	1729	235	1723	256	1886	293	8905	1301

[15] The total number of employees/workers as at 31.12. of the calendar year in question is to be entered, irrespective of the level of time worked, but only in an employment relationship (including agreement on work activity, excluding agreement on work performance). Other types of contractual relationships under the Civil Code that involve purchase of services are not included.

[16] The category "R&D Personnel" includes technical and professional personnel who are not directly involved in R&D&I but are indispensable for the research activity (e.g. operators of research facilities).

[17] The category "Researchers in other categories" includes all other staff who cannot be classified under any of the above categories (e.g. independent researcher/scientist).

[18] Who participates in the management and support of R&D&I in the institution.

[19] See Definition of Terms in Methodology HEI2025+.

[20] Total is the sum of the categories: professor, associate professor, assistant professor, assistant, R&I personnel, researchers in other categories and technical and economic staff.

Master's[21]	788	128	748	121	771	110	771	117	833	106	3911	582
Doctoral	301	37	329	42	334	39	315	44	333	48	1612	210
Lifelong Learning Courses	130	85	236	149	161	108	145	95	230	146	902	583
Total	2948	504	3151	575	2995	492	2954	512	3282	593	15330	2676

Table 3.1.5 - Study programmes in Czech/English

Type of study programme	Total[22] / Of which professional study programmes											
	2019		2020		2021		2022		2023		Total	
Undergraduate	14/2	0/0	14/2	0/0	14/1	0/0	14/1	0/0	12/1	0/0	68/7	0/0
Master's	18/8	0/0	17/6	0/0	16/7	0/0	16/6	0/0	13/6	0/0	80/33	0/0
Doctoral	15/6	0/0	20/8	0/0	27/13	0/0	30/11	0/0	31/12	0/0	123/50	0/0
Lifelong Learning courses	10/0	0/0	21/0	0/0	22/0	0/0	17/0	0/0	23/0	3/0	93/0	3/0
Total	47/16	0/0	51/16	0/0	57/21	0/0	60/18	0/0	44/16	3/0		

Note: For each SP type, enter the number of SPs in Czech language in the first cell and insert the number of SPs in English language after the slash in the same cell (e.g. 15/3), enter the number of professional SPs in Czech language in the second cell and insert the number of professional SPs in English language after the slash. Follow a similar procedure in the last column of the table (Total).

3.1.6 – R&D&I capacities

R&D&I field	FORD	FORD share [%]	Predominant type of research	Total share of industry group [%]
1. Natural Sciences	1.1 Mathematics	3,6	Basic Research	48,02
	1.2 Computer and information sciences	34,03	Balanced basic and applied research	
	1.3 Physical sciences	9,11	Balanced basic and applied research	
	1.4 Chemical sciences	0,25	Balanced basic and applied research	
	1.5 Earth and related environmental sciences	0,38	Balanced basic and applied research	
	1.6 Biological sciences	0,65	Balanced basic and applied research	
	1.7 Other natural sciences	0	Balanced basic and applied research	
2. Engineering and Technology	2.1 Civil engineering	0,35	Balanced basic and applied research	46,95
	2.2 Electrical engineering, Electronic engineering, Information engineering	37,63	Balanced basic and applied research	
	2.3 Mechanical engineering	0,28	Balanced basic and applied research	

[21] All master's degree students are listed, regardless of the length of their programme of study.

[22] The total number of study programmes for which admissions have been announced in a given academic year.

	2.4 Chemical engineering	0,03	Balanced basic and applied research	
	2.5 Materials engineering	3,44	Balanced basic and applied research	
	2.6 Medical engineering	2,48	Balanced basic and applied research	
	2.7 Environmental engineering	2,03	Balanced basic and applied research	
	2.8 Environmental biotechnology	0,01	Balanced basic and applied research	
	2.9 Industrial biotechnology	0	Balanced basic and applied research	
	2.10 Nanotechnology	0,21	Balanced basic and applied research	
	2.11 Other engineering and technologies	0,49	Balanced basic and applied research	
3. Medical and Health Sciences	3.1 Basic medicine	0,31	Balanced basic and applied research	1,83
	3.2 Clinical medicine	1,52	Balanced basic and applied research	
	3.3 Health sciences	0	Balanced basic and applied research	
4. Agricultural and veterinary sciences	4.1 Agriculture, Forestry, and Fisheries	0	Balanced basic and applied research	0
	4.2 Animal and Dairy science	0	Balanced basic and applied research	
	4.3 Veterinary science	0	Balanced basic and applied research	
	4.4 Other agricultural sciences	0	Balanced basic and applied research	
5. Social Sciences	5.1 Psychology and cognitive sciences	0,48	Balanced basic and applied research	1,74
	5.2 Economics and Business	0,29	Balanced basic and applied research	
	5.3 Education	0,92	Balanced basic and applied research	
	5.4 Sociology	0	Balanced basic and applied research	
	5.5 Law	0	Balanced basic and applied research	
	5.6 Political science	0,03	Balanced basic and applied research	
	5.7 Social and economic geography	0	Balanced basic and applied research	
	5.8 Media and communications	0,02	Balanced basic and applied research	
	5.9 Other social sciences	0	Balanced basic and applied research	
6. Humanities and the Arts	6.1 History and Archaeology	0,35	Balanced basic and applied research	1,45
	6.2 Languages and Literature	0,33	Balanced basic and applied research	
	6.3 Philosophy, Ethics and Religion	0,77	Balanced basic and applied research	

	6.4 Arts (arts, history of arts, performing arts, music)	0	Balanced basic and applied research	
	6.5 Other Humanities and the Arts	0	Balanced basic and applied research	
	Total	100 %	-	100 %

RECOGNITION BY THE RESEARCH COMMUNITY

3.2 Recognition by the research community

The evaluated unit will briefly comment on its position in the research community. It shall consider individual and other prestigious R&D&I awards, participation of its academic staff in the editorial boards of international scientific journals, elected membership in professional societies, major invited lectures given by the evaluated unit's academic staff abroad or by foreign scientists and other relevant guests at the evaluated unit. Additionally, it will address the involvement of staff in the evaluation of national or European project/programme calls over the period of 2019–2023 based on the data provided in annex tables 3.2.1 to 3.2.5 (max. 10 most relevant items). If necessary, the evaluated unit shall list any additional services to the scientific community that it considers relevant.

Maximum 1000 words.

Self-assessment: The Faculty of Electrical Engineering, Czech Technical University in Prague has long been producing dominant scientific research results and activities connected with them. The faculty employs teachers and researchers whose results reach world-class standards. Employees are invited to participate in various committees of professional societies, world conferences with a high professional level, as evaluators of European projects, but also of projects proposed outside Europe. Leading experts at the faculty are invited to give lectures at important world institutions, universities or companies. Leading world experts from various fields of electrical engineering, communication technologies, cybernetics, and robotics accept invitations to give expert lectures at the faculty. They achieve excellent results in the field of artificial intelligence, as well as in the control of robots or in the development of unmanned or autonomous systems. The activities of the employees of the university system are evaluated by various criteria. In addition to the monitored criteria listed in the tables below, it is necessary to add criteria such as: Member of a professional society, distinguished member (fellow) of a scientific society, visiting professor, award in a competition, award for popularization, member of a professional body, member of the program, organizational or editorial committee of a conference, review of articles in a major foreign journal, membership in the editorial board of a journal, membership in a committee of a scientific society, review of a professional book. The evaluated area "Recognition by the scientific community" is one of many other areas of monitored professional results of faculty staff.

Faculty employees are members of evaluation committees in multinational companies, they act as expert experts in committees at the level of government ministries, they are members of educational committees at the Ministry of Education, Sports and Youth, they are members of the National Accreditation Office for granting accreditation to study programs of Czech universities. Workers are members of professional bodies at the government level, serve on the boards of directors of multinational companies, and have the position of CEO of companies. The workers also prepare professional expert opinions for the Czech judiciary, etc.

The sample of the top 10 results presented includes only a very small portion of the results of the monitored categories listed in Tables 3.2.1 to 3.2.5.

Table 3.2.1 - Prestigious R&D&I awards granted during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the award	Awarding institution
Tomáš Svoboda, Jan Faigl, Karel Zimmermann, Tomáš Krajník, Martin Saska and team	2x 1st place among self-funded teams (3rd overall)	DARPA, event: DARPA SubTerranean Challenge, Tunnel and Urban Circuits https://www.darpa.mil/news-events/2019-08-22, https://www.aic.fel.cvut.cz/news/bronz-from-the-darpa-subterranean-challenge-urban-circuit
Tomáš Svoboda, Martin Saska, Jan Faigl, Karel Zimmermann and team	2nd place in DARPA SubT Challenges - Final Event Virtual Competition 2021	DARPA SubTerranean Challenge, Final Event Virtual Competition https://www.darpa.mil/news-events/2021-09-24a
Martin Saska, Tomáš Krajník and team	1st place in Robotic MBZIRC Grand Challenge 2020	Khalifa University in Abu Dhabi https://mrs.fel.cvut.cz/competitions/mbzirc2020-compe
Zdeněk Hurák, doc. Ing. Ph.D. Ing. Jekatěrina Jaroslavceva and her supervisor prof. Ondřej Chum and also to dr. Vojtěch Spurný and his supervisor doc. Martin Saska	Prize Werner von Siemens 2022 Prize Werner von Siemens 2023	Werner von Siemens Prize, https://www.cenasiemens.cz/minule-rocniky/vitezove-2022/#prumysl-40 https://cyber.felk.cvut.cz/news/werner-von-siemense-awards-2023/
Miloslav Čapek, prof. Ing. Ph.D.	IEEE Antennas and Propagation Edward E. Altshuler Prize Paper Award 2023	IEEE AP-S Awards 2023, https://ieeeaps.org/awards/winners-of-2023-ap-s-awards-announced
Alan Lukezic (University of Ljubljana), Žiga Trojer (University of Ljubljana), Jiri Matas (Czech Technical University, Prague), Matej Kristan (University of Ljubljana)	Best paper award BMCV2022	The British Machine Vision Association and Society for Pattern Recognition. https://bmvc2022.org/programme/paper-awards/
Jan Hlavnička, Ing. Ph.D.	Joseph Fourier Prize: second place in computer science, 2020	Joseph Fourier Prize, http://sami.fel.cvut.cz/CenaJF.pdf
Zuzana Kúkelová, RNDr. Ph.D.	Neuron Prize 2023	Winner of the Neuron Award 2023 for Young Promising Scientists in the field of Computer Science, one of the most prestigious Czech national scientific prizes (Award 20 000 EUR) https://www.nadaceneuron.cz/person/computer-science
Petr Pošík, Ing. Ph.D.	SIGEVO Impact Award	This award recognizes up to three papers a year that were published in the GECCO conference 10 years earlier and which are both highly cited and essential for the field. https://dl.acm.org/doi/10.1145/1830761.1830790
Dominika Burešová, Bc.	The Global Undergraduate Awards -Mathematics & Physics	Winner in the Highly Commended, Mathematics and Physics category of The Global Undergraduate Awards 2023, often referred to as the "Junior Nobel Prize." https://cyber.felk.cvut.cz/cs/news/dominika-buresovas-achievement-in-the-global-undegraduate-awards/

Note: Provide up to 10 examples.

Table 3.2.2 Participation of academic staff of the evaluated unit in editorial boards of international scientific journals during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of scientific journal, ISSN
Chum Ondřej, prof. Mgr., Ph.D.	International Journal of Computer Vision, ISSN 0920-5691, (IF 11.6, D1), https://www.springer.com/journal/11263
Matas Jiří, prof. Ing. Ph.D.	International Journal of Computer Vision, ISSN 1556-6013, (IF 11.6 D1), http://www.ijcv.org/ (Editor-in-Chief)
Pevný Tomáš, doc. Ing. Ph.D.	IEEE Transactions on Information Forensics and Security, ISSN 1556-6013, (IF 6.3 Q1), http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=10206
Faigl Jan, prof. Ing. Ph.D.	IEEE Transactions on Automation Science and Engineering, ISSN 1545-5955, (IF 5.9 Q1), https://www.ieee-ras.org/publications/t-ase/editorial-board
Havlena Vladimír, prof. Ing. CSc.	Control Engineering Practice, ISSN 0967-0661, (IF 5.4 D1), https://www.sciencedirect.com/journal/control-engineering-practice
Haasz Vladimír, prof. Ing. CSc.	Measurement, ISSN 0263-2241, (IF 5.2 Q1), https://www.journals.elsevier.com/measurement
García Sebastián, Ing. Ph.D.	Computers & Security, ISSN 0167-4048, (IF 4.8 Q1), https://www.journals.elsevier.com/computers-and-security
Jakub Mareček, Mgr. Ph.D.	IEEE Open Journal of Intelligent Transportation Systems, ISSN 2687-7813, (IF 4.6), https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=8784355
Pošík Petr, Ing. Ph.D.	Evolutionary Computation, ISSN 1063-6560, (IF 4.6 Q1 Q2), http://www.mitpressjournals.org/loi/evco
Železný Filip, prof. Ing. Ph.D.	Machine Learning, ISSN 0885-6125, (IF 4.32 Q2), https://link.springer.com/journal/10994

Note: Please provide up to 10 examples of academic staff participation in editorial boards of international scientific journals (e.g. editor, editorial board member, etc.).

Table 3.2.3 The most important invited lectures delivered by the academic staff of the evaluated unit at foreign institutions during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Invited lecture title	Name of host institution, or name of conference or event	Year
Jiri Matas, prof. Ing. Ph.D.	Robust Fitting of Multiple Models in Computer Vision	14th International Conference on Computer Graphics Theory and Applications VISIGRAPP2019	2019
Michal Janošek, Ing. Ph.D.	Geomagnetic data sampling and acquisition – requirements and effects to avoid artifacts	SANSA Space Science, Hermanus, Pretoria	2022
Miloslav Čapek, prof. Ing. Ph.D.	Characteristic Modes for Antenna Analysis and Synthesis	EurAAP Organization board, Düsseldorf, https://www.eucap2021.org/conference/invited-and-keynote-speakers_new	2021
Zvánovec Stanislav, prof. Ing. Ph.D.	Transmission of millimeter wave signals over free space optical networks	IEEE Future Networks, Montreal , https://ieee-wf-5g.org/optical-wireless-communication-owc/	2021
Václav Knap, MSc. Ph.D.	Lithium-ion batteries in CubeSats	Lancaster University	2021

Tomáš Krajník, doc. Ing. Ph.D.	Chronorobotics: Cyclic Spatio-Temporal Models for Long-term Mobile Robot Autonomy	Autonomus Systems Lab., ETH Zurich	2019
Matěj Hoffmann, doc. Mgr. Ph.D.	Whole-body awareness for safe and natural interaction: from brains to collaborative robots	Laboratory of Molecular Biology, Cambridge, https://www3.mrc-lmb.cam.ac.uk/sites/gsasymposium/	2019
Martin Saska, ass. prof. Dr. rer. nat.	Deployment of closely cooperating aerial robots in demanding real-world environment	20th IEEE Latin American Robotics Symposium - LARS 2023	2023
Jan Sýkora, prof. Ing. CSc.	Cooperative coding and processing in radio networks	Universidad Distrital Francisco José de Caldas, Bogota https://comunidad.udistrital.edu.co/ciect14/programacion/	2019
Tomáš Krajník, doc. Ing. Ph.D.	Chronorobotics: Modeling Time for Service Robots	Queen Mary University in London	2019

Note: Provide up to 10 examples.

Table 3.2.4 - The most important lectures by foreign scientists and other guests relevant to R&D&I at the evaluated unit during the evaluation period

Name, surname and title(s) of the lecturer	Lecturer's employer at the time of the lecture	Invited lecture title	Year
Pietro Michiardi, prof.	EURECOM, Sophia Antipolis, France	Generative Diffusion Models: Key Ideas, Current Practice and Research Challenges	2023
Prof. John Collomosse	Adobe Research	Content Provenance: To Authenticity and Beyond!	2023
Julia Frankenstein, Dr.	TU Darmstadt, Germany	Symmetry and Human Perception	2022
Amita Shrestha, Dr.	German Aerospace Center, Germany	FSO Satellite to ground links	2022
Richard Sutton (PIS)	University of Alberta, Canada	The Alberta Plan for AI Research	2022
Werner Magnes	Space Research Institute (IWF) of the Austrian Academy of Sciences - vice director, Austria	Spaceborne Magnetic Field Measurements	2020
dr. Calvanese Strinati	CEA-Leti, Grenoble, Francie	Green Communications as an enabler for Future 5G Mobile Networks	2020
Sajeev John, prof.	University of Toronto, Canada	Photonic Crystal Light Trapping: The Key to Breaking Photovoltaic Efficiency Barriers,	2019
Zabih Ghassemlooy, Prof.	Northumbria University, Newcastle upon Tyne, Great Britain	Visible Light Communications	2019
Bogdan Savchynskyy, Dr.	University of Heidelberg, Germany	Overview of first-order optimization methods for the LP relaxation of discrete energy minimization	2019

Note: Provide up to 10 examples.

Table 3.2.5 - Involvement in the evaluation of national/European research project/programme calls relevant to the R&D&I area at the unit during the evaluation period

Name, surname and title(s) of the evaluated unit's staff member	Name of the research project/programme call	Name of the contracting authority/guarantor of the project/programme call	Year
Jiří Matas, prof. PhD. Ing.	ERC Synergy Panel	European Research Council	2019-2022
Daniel Novak, doc. Ing. Ph.D.	EU Horizont, SME Phase I, II, now Accelerator	European Research Council	2019-2023
Pavel Ripka, prof. Ing. CSc.	MINT	Swiss National Science Foundation	2023
Pavel Ripka prof. Ing. CSc.	VV 2021 for basic research	APVV (Slovak Research Agency)	2021, 2022
Roman Čmejla, prof. Ing. CSc.	Evaluation panel of Czech Health Research Council (AZV ČR)	Czech Ministry of Health	2020-2022
Pavel Hazdra, prof. Ing. CSc.	CSF Standard, Bilateral, and Lead Agency projects, Panel 102	Czech Science Foundation	2019,2021 -2023
Jan Kybic, prof. Dr. Ing.	CSF (GAČR), panel 202	Czech Science Foundation	2013-2021
Jiří Matas, prof. PhD. Ing.	CSF (GAČR), panel 103	Czech Science Foundation	2013-2021
Pavel Ripka, prof. Ing. CSc.	CSF (GAČR), panel 202	Czech Science Foundation	2020-2023

Note: Provide up to 10 examples.

RESEARCH PROJECTS

3.3 Research projects

The evaluated unit shall list at most 10 (considered most significant by the evaluated unit) research projects/activities (regardless of whether they are supported by public funds or based on contract research[23]) that it has implemented or participated in during the period of 2019–2023[24]. This should be done from the full list in annex tables (Table 3.3.1-3.3.2)[25], regarding particularly the results achieved or the application potential of the projects. The unit should also describe how the research projects contributed to the mission and purpose of the evaluated unit. If the evaluated unit has been a participant in a listed project, it shall indicate which other entities were involved and describe its contribution to the project. The interdisciplinary aspects of the projects will also be commented on, along with any collaboration with other units of the evaluated HEI.

Maximum 300 words per project.

Self-assessment:

In the reporting period, a total of 414 applied research projects were started (230 with FEE CTU as the main coordinator). 303 were supported by national sources, 91 from within the EU, and the rest received support from the USA, Canada, Taiwan and other developed countries.

More than 450 commercial contracts were signed with large corporations and with small or medium-size enterprises (SME). The income from the contracted research totals approx. EUR 14.1M. The revenues from these activities represent a significant part of the faculty budget, and they have been growing in recent years; revenues in the reporting period: EUR 2.4M (2019), EUR 2.3M (2020), EUR 2.1M (2021), EUR 3.4M (2022), EUR 3.8M (2023).

[23] For the definition of contract research for the purposes of evaluation in the HE segments, see Article 2.2.1 of the Community Framework for State Aid for Research, Development and Innovation 2014/C 198/01.

[24] Regardless of whether the projects are completed or still ongoing, provided that at least part of the project was implemented during the evaluation period.

[25] The evaluated unit shall only fill tables that are relevant to it.

National funded projects

Research Center for Informatics (RCI) - funded by the Operational Programme Research, Development and Education under the call for Excellent Research with a total budget of CZK 610M/ EUR 24.2M during the period 2018-2023. The RCI facilitated and supported collaboration between experts from three faculties on a range of areas of informatics (computer vision, graphics, AI and CS theory, cybersecurity, high-performance computing, bioinformatics, robotics). Given the wide span of AI, Informatics and CS, it had an interdisciplinary feel. A significant part of the funding was spent on building the RCI computational cluster worth CZK 41.6M/EUR 1.65M. The goals of the Center in the first five years included were specified as a certain number of new researchers to be hired, a number of quality papers published and, last but not least, a requirement on the number of patents filed. All the milestones were met. Besides increasing both the HR and computational capacities of CTU in the area of AI and CS, it integrated the distributed research and allowed best practices to be shared. It allows certain high-profile researchers, like Jakub Marecek, to get established at CTU.

Centre of Advanced Photovoltaic (CEP), faculty www - funded by the Ministry of Education, Youth and Sports with a total budget of CZK 151M/ EUR 6M during the period 2016-2023. FEE was principal investigator. The main objective of the project was to create a Centre for advanced photovoltaics under the auspices of the Czech Technical University in Prague, which unified previously fragmented activities in the field of photovoltaics. The new center, on the one hand, involved academics, technologists, system engineers, architects, etc., and on the other hand it provided a single technical support on a sufficiently large scale. CAP brought together top experts in the field of photovoltaics from the CTU in Prague and abroad. The unique connection between experts from the material engineering and architectural concepts brought many new opportunities to utilize photovoltaics.

Future Electronics for Industry 4.0 and Medical 4.0 (FEIM) - funded by Technology Agency of the Czech Republic under the call National Centres of Competence. The total funding is CZK 461M/EUR 18.3M. The project started in 2023, bringing together four largest technical universities in Czechia, and 22 industrial partners. FEE is the main coordinator. Main objective of the project is to create a synergic interdisciplinary cooperation between research and commercial companies. The goal is to realize intelligent structures, components, sensors, modules and systems and connectivity with reduced production costs, high reliability and competition in global markets to meet the trend of Industry 4.0, Medical 4.0. Sub-objectives include the development of smart technologies for structural electronics, sensors, embedded systems including interfaces for data transmission and processing, all common to support the development of industrial and medical systems. The results will be used for modern industrial, transport, defence and security systems, for increasing the safety of production processes and for improving the quality of life of people in society.

Human-Compatible Artificial Intelligence with Guarantees – funded by the European Commission under the Horizon Europe programme, with the Czech Technical University (CTU) as coordinator and the Faculty of Electrical Engineering (FEE) allocated a budget of EUR 2.5 million in the evaluated period – is a major initiative focused on the ethical development of artificial intelligence (AI). Within this framework, the project addresses fairness in AI by designing explainable and transparent algorithms to enhance both their functionality and user understanding.

The project integrates expertise from computer and data sciences, control theory, optimization, ethics, and law to develop AI systems that are not only technically robust but also aligned with ethical standards. To validate its methodologies, the project includes three key case studies:

1. Fair Evaluation in Recruitment – Developing AI tools that eliminate biases in hiring processes.
2. Gender Equality in Advertising – Ensuring AI-driven marketing strategies do not reinforce gender bias.
3. Fairness in Financial Services – Preventing discrimination in banking and credit assessments.

The project consortium consists of eight organizations across five countries, including Imperial College London, Technion, Athena Research Center, and the National and Kapodistrian University of Athens, and industry partners (IBM Research, Workable and Date.io) that contribute practical

insights and data. Led by Jakub Mareček from FEE CTU, the project aims to set new standards for fairness in AI, ensuring trust, transparency, and ethical alignment in its applications.

Research Infrastructure for Doctoral Programmes at CTU FEE - funded by the Operational Programme Research, Development and Education under the call Research infrastructures for educational purposes - development or modernisation with a total budget of CZK 199M/EUR 7,9M. The project was focused on the significant development and modernisation of infrastructure (i.e. mainly instrumentation and laboratory equipment) that will be used for the newly formed doctoral study programmes at the FEL. The modernisation of instrumentation enables doctoral students to work on topics related to the requirements of the knowledge economy and other future challenges in particular industries and in the approach to solving scientific research problems. Upon graduation, they will be prepared to work in international companies and at excellent scientific research institutes. Practical acquaintance and mastery of modern technologies at the top level will provide them with a competitive advantage when entering the labour market in the Czech Republic and abroad. That will also increase the interest of foreign students and excellent academic and scientific staff in working at CTU FEL, which will support the necessary internationalization of the environment at the faculty. In such an environment, international scientific teams with results comparable to scientific teams from abroad will be created.

Novel nanostructures for engineering applications (NANO) - funded by the Ministry of Education, Youth and Sports from OP - EU Operational Programme resources in the total amount of CZK 100M/ EUR 4M during the period of 2018-2023. Two commercial companies were involved. The project exploited the potential of new plasma-based deposition methods supported by atomistic and large-scale simulations to design, prepare and test new classes of thin films and 2D materials, and laser treatment of surfaces. It initiated new intra (Departments of Control Engineering, Physics, Economics/Humanities) and inter (with the Faculty of Mechanical Engineering and Faculty of Nuclear Sciences) faculty collaborations, and stimulated international collaboration resulting in more than 30 joint papers with leading UK, US and Chinese universities. The project supported 7 successful PhD students and 14 BSc/MSc these (half co-supervised by industrial experts) and resulted in more than 50 papers in leading journals, including Nature Materials 2022 (led by our junior researcher and co-authored by our PhD student, >160 citations) or Nature Comm 2020 (>200 citations). Three postdoctoral researchers hired for the project were promoted to tenure track assistant professor positions, and one was later promoted to associate professor. Newly established Thin film laboratory with industrial size magnetron deposition and analytics (project investment of €1.2m) opened pathway for direct industrial collaborations in the Czech Republic (3 industrial TACR projects) and abroad (coordination of mERA-Net project Lubricoat with Fraunhofer and 4 companies, €2m). Project produced two ES/EU patents; another notable result is novel coating reducing friction now applied in actuators of fighter jet L-39NG. One part of project activities, development of protective coating, is now being commercialized through CTU spin-off AdvaMat Coatings.

Contracted projects

TOYOTA: Computer vision and AI - Among FEE industrial contracts, the collaboration with Toyota Motor Europe headed by prof. J. Matas stands out within the company-funded research in many ways. First, it is very long term, starting in 2003. Since 2016, i.e. in the last 10 years, the project's total income has been above EUR 5M (EUR 3.5M in the evaluated period), almost all covering personnel costs. The focus of the collaboration has changed overtime, from computer vision research related to assistive driving to general AI and machine learning research motivated by a wide range of current and future Toyota activities, including robotics, smart cities and autonomous vehicles. Mostly, the activities fall in the basic research rubric; the typical outcome of a TME-supported activity is a paper at a major conference or a patent, typically both. The patents are co-owned by Toyota and CTU FEE. The contract allows funding of PhDs, usually 2-3. The project guarantees that FEE research stays relevant for the industry. The participating academics get familiar with various aspects of Toyota's way of achieving reliability and general technical excellence, which

are partially transferable to the academic domain. The institutions collaborating with Toyota are organised in the so-called TRACE Lab, https://www.trace-lab.com/, and include, besides CTU, prestigious organisations - the University of Cambridge, ETH Zurich, Max-Planck Inst. for Informatics, and KU Leuven.

DARPA Subterranean Challenge

The Subterranean (SubT) Challenge was three year-long (2018-2021) a Defense Advanced Research Projects Agency (DARPA) program to develop innovative technologies that can augment underground operations. The SubT Challenge program explored new approaches to rapidly map, navigate, search, and exploit complex underground environments such as human-made tunnel systems, urban underground, and natural cave networks. These difficult settings present challenges for military and civilian first responders; hazards vary drastically across terrain that can change over time, making it too risky for personnel to enter. CTU team started as a self-funded team and scored very well in tunnel (2019) and urban (2020) circuits winning 200 thousand and 500 thousand USD respectively. Based on these excellent results, the joint team CTU and Uni Lavalgot additional 1.5 mil USD funding (1.2 mil for CTU). In the final round (2021) the team won additional 500 thousand USD in the virtual challenge totaling the DARPA support 2.7 mil USD (~67 mil CZK), most of it went to our faculty for covering personal cost and new robots and other robotic equipment. The DARPA project supported many PhD and undergraduate students, topping in around 20 members' team in the final round. This challenge proved faculty's excellent world-top competence in autonomous robotics. The robotic team included wheeled, walking, tracked and flying robots. The competence in flying robots has been also demonstrated within project TII Abu Dhabi - funded by Technology Innovation Institute in total amount of CZK 19.4M/EUR 769k in the evaluated period. The project aimed to develop a system for precise localization, mapping and navigation in the cluttered environment of a multi-floor office building. In addition to that, the flying robots, supported by some ground ones, also won the MBZIRC Challenge in 2020.

VRUT system development (Virtual Reality Universal Toolkit) - funded by Škoda Auto, a.s. in the total amount of CZK 32.2M/EUR 1.3M in the evaluated period. A long-term cooperation with the leading car manufacturer in the Czechia (Škoda Auto) led to the creation of a complex software package VRUT. This software is designed for interactive and photorealistic rendering of large 3D data in the design phase of new cars. It uses the latest scientific knowledge in the field (coming from our researchers) and it is constantly being improved (in collaboration between programmers from our university, Škoda company, and several third parties). In Škoda Auto, it replaced previous commercial software solutions. The key person from the Faculty of Electrical Engineering of the CTU responsible for the further development of VRUT is Prof. Jiri Bittner from the Department of Computer Graphics and Interaction.

Avast AI and Cybersecurity Laboratory at FEE CTU (AAICL) – established in 2019 and funded by AVAST [LSE: AVST] in the total amount of CZK 18.4M/EUR 731k in the evaluated period – was a joint research lab dedicated to advancing artificial intelligence (AI) and machine learning (ML) in the field of cybersecurity. This collaboration between Avast, a global leader in digital security, and the Faculty of Electrical Engineering at the Czech Technical University in Prague (FEE CTU) aimed to address the growing sophistication of cyber threats.

By integrating Avast's extensive threat data, collected from over 400 million devices globally, with CTU's expertise in analysing complex and evasive threats, the laboratory strived to anticipate and counteract emerging cybercriminal tactics that exploit new technologies, including AI, to orchestrate sophisticated cyberattacks. The laboratory's objectives encompassed publishing research and enhancing Avast's malware detection engine, particularly its AI-based detection algorithms.

The five-year funding has facilitated scientific research in AI and ML, helping CTU expand its talent pool and establish itself as a leading academic institution in AI and cybersecurity. AAICL employed

three full-time senior researchers and up to ten PhD students from CTU FEE, fostering collaboration between industry and academia. This partnership addressed significant cybersecurity challenges, including detecting evolving malware, securing IoT devices, and analysing fake news.

Table 3.3.1 Projects supported by public funds

In the role of beneficiary						
Provider[26]	Project name	Support (in thousands CZK/EUR)[27]				
		2019	2020	2021	2022	2023
GA CR	Advanced structures and characterization methods of nonlinear backscattering for identification and sensing (2023–2025)					1376/54280
GA CR	Novel ionic crystals and their surfaces as the key to future photovoltaic materials (NicePV) (2023–2025)					1930/76134
GA CR	Agile swarms of aerial robots with reliable multimodal sensing and state-estimation capabilities (2023–2025)					3562/140513
GA CR	Intelligent Radio Resource and Mobility Management based on Federated Learning (2023–2025)					1954/77081
GA CR	Superlubricity: sliding of 2D materials (2023–2025)					2771/109310
GA CR	Learning Models of Quantum Systems as a Non-Commutative Polynomial Optimization Problem (2023–2025)					2662/105010
GA CR	The study of z-pinch physics with novel diagnostic methods using fast ions (2023–2025)					2187/86272

[26] If the provider is from abroad, please indicate the provider's country of origin in brackets. For the determination of the country of origin of the provider, the place of residence of the provider is decisive.

[27] Indicate the total amount expressed in thousands of CZK and the conversion of the total amount into Euro.

GA CR	Statistical Relational Learning in Dynamic Domains (2023–2025)					2343/92426
GA CR	Advanced methods of sound and elastic wave field control: acoustic black holes, metamaterials and functionally graded materials (2022–2024)				973/38383	1435/56607
GA CR	Sampling-based motion planning in scenarios with narrow passages (2022–2024)				1191/46982	1612/63590
GA CR	Advanced microwave photonics techniques based on hollow-core optical fibers (2022–2024)				1693/66785	1777/70099
GA CR	Unsupervised learning from heterogeneous structured data (2022–2024)				3642/ 143669	3522/139
GA CR	Multi-Goal Task-Motion Planning (2022–2024)				3650/ 143984	3410/134517
GA CR	Algorithms for Playing Massive Imperfect-Information Games (2022–2024)				2906/ 114635	2906/114635
GA CR	Towards Optimal Solution of Robotic Routing Problems (2022–2024)				1939/76489	2008/79211
GA CR	Persistent problems of repetitive control (2021–2023)			2092/82525	2208/87101	2203/86903
GA CR	Autonomous time-critical exploration of communication and perception constrained environment by team of robots (2020–2023)		3893/153570	3992/ 157475	4207/ 165957	
GA CR	End-to-end learning of optimal portfolios (2020–2022)		2240/88363	2032/80158	2298/90651	185/7298
GA CR	To the origin of the fluxgate noise (2020–2022)		3058/120631	2925/ 115385	3345/ 131953	

GA CR	Reliable sensing-driven compact groups of micro aerial robots with adaptive shapes (2020–2022)		2273/89665	2280/89941	2280/89941	
GA CR	NanoFluxGate (2020–2022)		2372/93570	2516/99250	2516/99250	
GA CR	Essential Elements of Diamond Power Electronics (2020–2022)		1505/59369	1505/59369	1505/59369	
GA CR	Antenna Arrays with Quantized Controlling (2020–2022)		1005/39645	1165/45957	1159/45720	
GA CR	Population standard of acoustic-phonetic characteristics in children's speech (2019–2021)	804/31716	817/32229	817/32229		
GA CR	Distributed Control of Vehicle Formations and Networked Systems (2019–2021)	2695/106312	2781/109704	2797/ 110335		
GA CR	Fundamental bounds on electromagnetic radiation and scattering phenomena and associated realizable subforms (2019–2021)	1985/78304	1897/7832	1863/73491		
GA CR	Multi-Robot Persistent Monitoring of Dynamic Environments (2019–2021)	1561/61578	2211/87219	2524/99567	1012/40	
GA CR	Aerodynamic bodies with actively controlled morphing (2019–2021)	2375/93688	2509/98974	2199/86746	203/8	
GA CR	Current disruption and magnetic energy dissipation during acceleration of electrons and ions in z-pinch plasmas (2019–2021)	1639/64655	1644/64852	1685/66469		
GA CR	Generalized Image Retrieval and Relation Discovery (2019–2021)	1465/57791	1542/60828			
GA CR	Compositional Architectures for	2240/88363	2126/83866	2641/ 104181	120/4734	

	Pattern Recognition (2019–2021)					
GA CR	Complex prediction models and their learning from weakly annotated data (2019–2021)	1204/47495	1392/54911	1323/52189	133/5247	
GA CR	On-Demand Fleet Management with Quality of Service Guarantees (2018–2020)	775/30572				
GA CR	Robotic Lifelong Learning of Multi-legged Robot Locomotion Control in Autonomous Data Collection Missions (2018–2020)	1883/74280	1864/73531			
GA CR	Communication in Self-optimizing Mobile Networks with Drones (2018–2021)	1730/68245	2058/81183	103/4063		
GA CR	Hierarchical models for detection and description of anomalies (2018–2020)	1679/66233	1620/63905	147/5799		
GA CR	Interactive Rendering with Distributed Illumination Computations (2018–2020)	2062/81341	2105/830375			
GA CR	Incorporation of Prior Knowledge for Identification of Nonlinear Systems (2018–2020)	1662/65562	1703/67179			
GA CR	Propagation of acoustic waves through phononic materials and structures (2018–2020)	1044/41183	1127/44458			
GA CR	Learnable Models for Dense Image Matching (2018–2020)	1048/41341				
GA CR	Transaction costs of energy efficiency programmes: the effect of learning (2018–2019)	667/26312				

GA CR	Multicriteria Optimization of Shift-Variant Imaging System Models (2017–2019)	1159/45720				
GA CR	Deep relational learning (2017–2019)	1715/67653				
GA CR	Combined Radio Frequency and Visible Light Bands for Device-to-Device communication (2017–2019)	2404/94832				
GA CR	New methods for the measurement of electric currents (2017–2019)	1661/65523				
GA CR	Complex Artificial Electromagnetic Structures and Nanostructures (2017–2019)	970/38264				
GA CR	Radiation damage tolerant nanomaterials: design of interfaces with self-healing properties (2017–2019)	3411/134556				
GA CR	Learning local concepts from global training data for biomedical image segmentation and classification (2017–2019)	936/36923				
GA CR	Robust motion planning and control on rough unstructured terrain (2017–2019)	1262/49783				
GA CR	Localized Electronic Effects of Antibody Binding on NanoComposite Materials (LEEFAB) (2017–2019)	1619/63866				
GA CR	Wireless Sensing of Physical Quantities in Complex Environment (2017–2019)	1288/50809				
GA CR	Otoacoustic emissions in normal cochlea and cochlea with					1106/43629

	endolymphatic hydrops: modeling and experiments (2023–2025)					
GA CR	Learning Complex Motion Planning Policies (2021–2023)			1128/44497	1958/77239	2203/86903
GA CR	Towards long-term autonomy through introduction of the temporal domain into spatial representations used in robotics (2020–2021)		1230/48521	1485/58580		
GA CR	Non-invasive temperature estimation inside of human body based on physical aspects of ultra-wideband microwave channel (2017–2019)	1463/57712				
GA CR	Reducing speech-related side-effects of deep brain stimulation in Parkinson's Disease via automated speech analysis (2021–2023)			2352/92781	2415/95266	2415/95266
GA CR	Game Over Eva(sion): Securing Deep Learning with Game Theory (2019–2021)	411/16213	767/30256	1430/56410	589/23234	
GA CR	Koopman operator framework for control of complex nonlinear dynamical systems (2020–2022)		1596/62959	1823/71913	2051/80907	
GA CR	Generative Relational Models (2020–2022)		2306/90966	2229/87929	2547/ 100473	
GA CR	Sampling-based planning of actions and motions using approximate solutions (2019–2021)	1377/54320	1523/60079	1476/58225		
GA CR	Computing Equilibrium Strategies in Dynamic Games (2019–2021)	1672/65927	1475/58185	1682/66351	399/15740	
GA CR	Online Solution Methods for Imperfect-Information Games (2018–2020)	1488/58698	1591/ 62761	46/1815		

GA CR	Privacy Preserving Multi-agent Planning (2018–2020)	1480/58383	1484/58			
GA CR	Spatio-temporal representations for life-long mobile robot navigation (2017–2019)	1967/77594				
GA CR	Nanoscale Strategies for Transition Metal Dichalcogenides Exfoliation (2017–2019)	1875/73 964				
GA CR	Robot self-calibration and safe physical human-robot interaction inspired by body representations in primate brains (2017–2019)	2330/91913				
GA CR	Stabilization and control of teams of relatively-localized micro aerial vehicles in high obstacle density areas (2017–2019)	1229/48481				
GA CR	TOPFLIGHT: Trajectory and Mission Planning for Agile Flight of Aerial Robots in Cluttered (2023–2027)					4524/178462
GA CR	Strong electromagnetic pulses: their generation, characterization and control (2023–2027)					3747/147811
GA CR	New generation of camera geometry solvers (2022–2027)					2408/94990
GA CR	Learning Universal Visual Representation with Limited Supervision (2021–2025)			2327/91795	3992/ 157475	5233/206430
GA CR	Optimal Electromagnetic Design Based on Exact Reanalysis (2021–2025)			2319/91479	3777/ 148994	3882/153136
GA CR	Whole-body awareness for safe and		2911/114832	4992/ 196923	4480/ 176726	4420/174

	natural interaction: from brains to collaborative robots (2020–2024)					
(other CZ provider)	Pilotní implementace schématu QKD založeného na provázaných fotonech v bezdrátovém optickém spoji (2022–2023)				56/2209	297/11716
(other CZ provider)	FEEL: FEderatEd Learning for network security (2021–2022)			82/3235	471/18580	
(other CZ provider)	An Improved IDS for IoT Threats Detection using Federated AI Learning and P2P cooperation (2020–2021)		266/10493	34/1341		
(other CZ provider)	Spreading innovative results from European University Alliances to other higher education institutions (2023–2023)					18/1
(other CZ provider)	Posilování kapacit Národní technické univerzity Ukrajiny „Kyjevský polytechnický institut Igora Sikorského“ v oblasti kvality a inkluze vzdělávacího procesu, internacionalizace a podpory spolupráce (2020–2021)		204/8473			
Min Cult CR	A Century of Information: The World of Informatics and Electrical Engineering – The Computer World Inside Us (2018–2021)	880/34714	887/34990	899/35463		
Min Cult CR	Safe scanning of historical objects by unmanned helicopters - assistive technologies, methodics and exploitation in heritage protection (2018–2022)	2491/98264	2446/96489	2446/96489	2367/93372	

Min Def CR	COE - Rezognize whether the analyzed data stream is compressed or encrypted (2018–2020)	974/38422	412/16252			
Min Ind Trade CR	Systém pro sociální zdrženlivost založený na prediktivních prostoročasových modelech (2020–2021)		356/14043	2079/82011		
Min Edu Youth Sports CR	Generalized Image Retrieval and Relation Discovery (2020–2022)		7686/303195	7226/ 285049	2162/85286	
Min Edu Youth Sports CR	Support of Sustainability for the Development and Implementation Laboratories of the Czech Technical University in Prague (2015–2020)	3600/142012	1600/63116			
Min Edu Youth Sports CR	Cell electromagnetic structures with higher symmetries (2020–2023)		605/23866	1132/44655	1185/46746	965/38067
Min Edu Youth Sports CR	Cooperation with International Research Centre in Area of Digital Communication Systems (2020–2024)		2669/105286	3766/ 148560	4016/ 158422	4016/158422
Min Edu Youth Sports CR	Miniature Antenna Development for Communication between Airborne Drones in Swarm (2020–2023)		442/17436	442/17436	598/23590	
Min Edu Youth Sports CR	Towards Optimal Curvature-Constrained Tours in Robotic Applications (2019–2022)	423/16686	1272/50178	1098/43314	932/36765	
Min Edu Youth Sports CR	Transmission of Millimeter Waves over Fiber and Free-space Optical Infrastructures (TraFFIc) (2018–2021)	1233/48639	1233/48639	991/39093		
Min Edu Youth Sports CR	Cooperation with the International Research Centre in Area of Communication Systems (2018–2019)	3099/122249				

Min Edu Youth Sports CR	Cooperative Coding and Processing in Dense Radio Cloud Communication Networks (2017–2020)	962/37949	375/14793			
Min Edu Youth Sports CR	High-energy processes in plasmas generated by pulsed-power devices (2017–2020)	562/22170	563/22209			
Min Edu Youth Sports CR	Reserch in frame International Center for Dense Magnetized Plasmas (2018–2021)	2223/87692	2223/87692	1510/59566		
Min Edu Youth Sports CR	Key technologies for Time-Of-Flight sensor data processing and visualization (2017–2019)	2356/92939				
Min Edu Youth Sports CR	Study on Power Electronics Based Energy Router and Its Control Strategy (2017–2019)	463/18264				
Min Edu Youth Sports CR	Predictive allocation of edge computing resources for autonomous driving (2022–2025)				539/21262	1015/40039
Min Edu Youth Sports CR	Robosoutěž 2022 (–)				248/9783	
Min Edu Youth Sports CR	ROBOSOUTĚŽ (2020–2021)		88/3471			
Min Edu Youth Sports CR	Lifelong learning of dynamic objects detection and tracking in adverse conditions for autonomous vehicles (2018–2019)	54/2130				
Min Edu Youth Sports CR	Life-long learning of environmental dynamics for socially-aware navigation of autonomous robots (2023–2024)					78/3077
Min Edu Youth Sports CR	Engineers and managers in Europe in (re)construction from the 19th to the 21st century. Technicians, organizers and managers in Czech lands/Czechoslovakia					78/3077

	and in France. (2023–2024)					
Min Edu Youth Sports CR	MHD instabilities and anisotropy of neutrons emission in Plasma Focus devices (2019–2020)	90/3550		96/3787		
Min Edu Youth Sports CR	Identifying Undoable Actions and Events in Automated Planning by Means of Answer Set Programming (2019–2020)	92/3629	52/2051	52/2051		
Min Edu Youth Sports CR	Digitization of Historical Astronomical Photographic Records (2018–2019)	22/868				
Min Edu Youth Sports CR	Polymer Composites as Functional Materials for Embedded Sensors and Optical Waveguides (2018–2019)	57/2249				
Min Edu Youth Sports CR	Exploration of nonlinear predictive control approaches for vehicle dynamics applications (2020–2022)		40/1578	104/4103	104/4103	
Min Int CR	Improvement of the region's resistance to risk of blackout using new technologies and crisis management procedures (2019–2022)	2217/87456	4464/176095	4467/ 176213	2219/87535	
Min Int CR	Strategic infrastructure protective system detecting illegal acts intentionally affecting GNSS signals (2017–2021)	6013/237199				
Min Int CR	Unique versatile security camera based on nanotechnologies (2015–2019)	1438/56726				
Min Health CR	Automatic detection and objective parametrization of hypometabolism in					1640/64694

	PET brain imaging (2023–2026)					
Min Health CR	Video analysis of hypomimia in Parkinson's disease and other synucleinopathies (2023–2026)					610/24063
Min Health CR	Hippocampal involvement in neocortical epilepsy networks: Implications for surgical planning (2021–2024)			644/25404	937/36963	977/38540
Min Health CR	Smart Speech Biomarkers for Parkinson's Disease and Other Synucleinopathies (2020–2024)		2366/93333	3210/ 126627	3554/ 140197	3129/123432
TA CR	Evaluating the behaviour of automated vehicles in terms of compliance with ethical and legal principles in mixed traffic (2023–2025)					4008/158107
TA CR	GNSS signal interference detector for integrated safety means in road transport (2021–2024)			4751/ 187416	4217/ 166351	4464/176095
TA CR	Electrochemical system for recycling industrial copper cable waste (2020–2023)		1649/65049	1981/78146	2020/79684	995/39250
TA CR	Advanced sensors and sensor data processing methods (2014–2019)	6000/236686				
TA CR	Integrated Satellite and Terrestrial Navigation Technologies Centre (2012–2019)	5143/202880				
TA CR	AI-enabled Multimodal Semantic Communications and Computing (2023–2026)					252/9941
TA CR	Superhard solid lubricant coatings (2021–2024)			1794/70769	3113/ 122801	3174/125207

TA CR	Interactive Perception-Action-Learning for Modelling Objects (2019–2022)	645/25444	1109/43748	1005/39654	257/10138	
TA CR	Optical planar channel polymer waveguides for high-capacity and high-speed data transmission (2019–2021)	2113/83353	2053/80986	2053/80986		
TA CR	Technology for competencies assessment using virtual reality and eye tracking (2018–2020)	1068/42130	1681/66312			
TA CR	Ludus: Machine Learning and Game Theory to Collaboratively Defend Against Internet Threats (2016–2019)	3023/119250				
TA CR	Design of Large Master-Key Systems through Artificial Intelligence (CyberCalc) (2016–2019)	2120/83629				
TA CR	Quality Assurance System for Internet of Things Technology (2017–2020)	2887/113886	3013/118856			
TA CR	Development of a Probe for Preventive Protection of IoT Devices against Takeover Attempts (2017–2019)	1063/41933				
TA CR	Evaluation of energy efficiency policy instruments (2018–2019)	702/27692				
TA CR	Development of optical cables for use in special applications and in extreme conditions (2023–2025)					2045/806706
TA CR	Optimization of AMM deployment based on pilot projects and testing of value-added communication (2022–2024)				2200/86785	2200/86785

TA CR	Models and procedures for the optimal mix of support and regulatory tools for the development of clean mobility (2022–2023)				1212/47811	1582/62406
TA CR	Methodological tools for impact assessment of the introduction of smart metering to consumers (2019–2020)	1114/43945	957/37751			
TA CR	Methodological Framework for the Future Energy Market Design of the Czech Republic (2019–2020)	954/37633	1745/68836			
TA CR	Climate-energy plan for heating branch in the Czech Republic (2018–2019)	529/20868				
TA CR	Future Electronics for Industry 4.0 and Medical 4.0 (FEIM) (2023–2028)					13072/ 515660
EC	Cybersecurity for the Future (2023–2026)					2816/111085
EC	Techniques, Heritage, Territories of Industry (TPTI) (2022–2027)				149/5878	72/2840
EC	Digital Technologies for Lecturing and Learning (2021–2023)			2205/86982	2349/92663	2629/103708
EC	Modernisation of VET through Collaboration with the Industry (2017–2020)	2460/97041	1086/42840	419/16529		
EC	Optical and Wireless Sensors Networks for 6G Scenarios (2023–2027)					26287/ 1036966
EC	2nd training school COST project CA19111 (2022–2022)				49/1935	
EC	Human-Compatible Artificial Intelligence with Guarantees (2022–2026)				52477/ 2070108	11859/468

EC	Convergence of Electronics and Photonics Technologies for Enabling Terahertz Applications (2016–2020)	1537/60631	779/30730			
EC	CA19111 - European Network on Future Generation Optical Wireless Communication Technologies (2022–2022)				45/1765	
ESF through Prague Municip	CTU FEE - Smart solutions for Prague (2019–2021)	8079/318698	9929/391677	5027/ 198304		
ESF through Prague Municip	CTU - Information for Prague (2019–2021)	5280/208284	5581/220158	2892/ 114083		
ESF through Prague Municip	Preparation of commercialization of new education methods for the needs of the economy digitalization and industry 4.0 (2017–2019)	4275/168639				
ESF through Prague Municip	ČVUT FEL - ICT for Prague (2018–2020)	11882/ 468718	6041/238304			
ESF through Prague Municip	CTU FEL - Knowledge for Prague (2017–2020)	9820/387377	619/24418			
ESF through Min Edu Youth Sports CR	International Mobility of Researchers MSCA-IF II in CTU in Prague (2018–2021)	13636/ 537909	8099/319487			
ESF through Min Edu Youth Sports CR	Novel nanostructures for engineering applications enabled by emerging techniques supported by advanced simulations (2018–2022)	36229/ 1429152	16427/ 648008	17320/ 683235	5094/ 200947	
ESF through Min Edu Youth Sports CR	Advanced Testing of Automotive Radars (2018–2020)	4268/168363	3925/154832			
ESF through Min Edu	Development of capacity for strategic	10000/ 394477	3000/118343	4000/ 157791	4000/ 157791	

Youth Sports CR	research management at CTU in Prague (2018–2022)					
ESF through Min Edu Youth Sports CR	Research Center for Informatics (2017–2023)		120282/ 4744852	172805/ 6816765	85140/ 3358580	
ESF through Min Edu Youth Sports CR	Development and Transformation of the Doctoral Degree Study at FEE CTU (2016–2022)	1600/63116	357/14083	616/24300	1/39448	
ESF through Min Edu Youth Sports CR	Research Infrastructure for Doctoral Programmes at CTU FEE (2016–2022)	49902/ 1968521	14796/ 583669	37938/ 1496568	14899/ 587732	
ESF through Min Edu Youth Sports CR	Centre of Advanced Photovoltaics (2017–2023)	20860/ 822880	34278/ 1352189	10211/ 402801	20905/ 824655	
Intl Visegrad Fund	Reconstruction of dynamic visual stimuli from fMRI data (2023–2024)					7/276
Intl Visegrad Fund	Mental state classification and prediction using fMRI and EEG (2021–2022)				35/1381	
Intl Visegrad Fund	Visegrad Scholarship Program - Dmytrii Lekhovitskyi (2020–2021)			39/1538		
Intl Visegrad Fund	V4 Seminars for young scientists on publishing techniques in the field of engineering science (2018–2019)	16/631				
(other foreign provider)	Expert assistance to economic and regulatory questions arising from the district heating sector transformation in Czechia (2022–2023)					347/13676
(other foreign provider)	Surface and Waveguide Enhancement Raman Spectroscopy (SERS and WERS) for					150/5917

	detecting trace cortisol in saliva (2022–2023)					
(other foreign provider)	Realization of silicon nanophotonic active optical waveguide and circuits with rare earth ion implantation (2022–2023)					150/5917
(other foreign provider)	Policy, regulatory, economic and technology framework for low-carbon transformation of the Czech district heating sector (2021–2022)				360/14185	
(other foreign provider)	Uplink OFDMA Random Access (UORA) in Next Generation WiFi Networks (2021–2022)				160/6312	
(other foreign provider)	Digital Fluxgate Design with Temperature Compensation (2021–2022)				155/6114	
(other foreign provider)	Construction and autonomous verification of an indoor radio environment map using deep learning and robot based-on LoRaWAN (2021–2022)				140/5523	
(other foreign provider)	Utilizing flexible substrates for enhanced SERS (surface-enhanced Raman scattering) detection (2021–2022)				140/5523	
(other foreign provider)	DARPA SUBTERRANEAN CHALLENGE - PHASE 3 (2020–2021)			19384/ 764655		
(other foreign provider)	Game Theory for Adversarial Machine Learning (2020–2021)		717/28284	1150/45365		
(other foreign provider)	Using deep reinforcement learning to simulate security analyst (2018–2021)	303/11953	414/16331	1297/51164	1449/57160	

(other foreign provider)	Automatic acoustic speech analysis and REM sleep behaviour disorder for detecting subjects at high risk for Parkinson's disease and other alpha-synucleinopathies (2017–2019)	2018/79606	549/21,657	499/19684		
Total		**249108/ 9826746**	**327960/ 12937278**	**375559/ 14814951**	**260243/ 10265996**	**156713/ 6181972**
In the role of another participant						
Provider[28]	Project name	Support (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
GA CR	Interplay of algebraic, metric, geometric and topological structures on Banach spaces (2023–2025)					1119/44142
GA CR	Structural changes induced by light soaking in mixed-halide perovskites (2023–2025)					1282/50572
GA CR	Printed heterogeneous gas sensor arrays with enhanced sensitivity and selectivity (2022–2024)				1411/55661	1453/57318
GA CR	Enriched categories and their applications (2022–2024)				654/25799	654/25799
GA CR	Network modelling of complex systems: from correlation graphs to information hypergraphs (2021–2024)			415/16371	912/35976	524/20671
GA CR	Investigation of atmospheric pressure plasma slit jet with complex electromagnetic excitation and plasma chemistry (2020–2022)		363/14320	505/19921	505/19921	
GA CR	Meteor clusters: An evidence for fragmentation of meteoroids in		663/26154	698/27535	641/25286	57/2249

[28] Ibid.

	interplanetary space (2020–2022)					
GA CR	New algorithms for accurate, efficient and robust analysis of large-scale systems (2020–2023)		920/36292	968/38185	968/38185	
GA CR	Circular RNAs and their relation to the RNA splicing in the pathogenesis of myelodysplastic syndromes (2020–2022)		270/10651	556/21933	618/24379	
GA CR	Towards AbloCAM: fundamental approaches to automated ablation-desorption imprinting of focused X-ray laser beams (2020–2023)		658/25957	505/19921	678/26746	296/11677
GA CR	Injectivity and Monads in Algebra and Topology (2019–2021)	1036/40868	685/27022	614/24221		
GA CR	New approaches to modeling and statistics of random sets (2019–2022)	547/21578	546/21538	547/21578		
GA CR	MoRePlan: Modeling and Reformulating Planning Problems (2018–2020)	967/38146	846/33373			
GA CR	Solving inverse problems for the analysis of fast moving objects (2018–2021)	1054/41578	1037/40907	122/4813		
GA CR	Manipulating properties of transition metal oxides interfaces (2018–2020)	832/32821	859/33886			
GA CR	Topological and geometrical properties of Banach spaces and operator algebras II (2017–2019)	553/21815				
GA CR	Methods of Identification and Visualization of Tunnels for Flexible Ligands in Dynamic Proteins (2017–2019)	482/19014				

GA CR	Charge transfer and microbiological interactions of hybrid metal oxide nanostructures (2019–2021)	1030/40631	1042/41105	1078/42525		
GA CR	The many facets of orthomodularity (2020–2022)		926/36529	1057/41696	1355/53452	
GA CR	Diffusion control reducing friction of nanocomposite materials (2019–2021)	2642/104221	2970/117160	2756/ 108718		
Min Cult CR	3D digital objects presentation and preservation in museum collections (2020–2022)		1393/54951	1882/74241	1401/55266	
Min Cult CR	Laterna magika. Past and present, documentation, preservation and acces (2016–2019)	897/35385				
Min Cult CR	Complex care for cultural heritage in the field of gaming applications (2023–2027)					1356/53491
Min Ind Trade CR	Intelligent control of processes depending on the noise intensity (2019–2022)	556/21933	1598/63037	1650/65089	588/23195	
Min Ind Trade CR	High-speed optical source modules for data centers (2019–2022)	1620/63905	1620/63905	1620/63905	1620/63905	
Min Ind Trade CR	Radio-optical transmission terminal for 5G networks (2018–2020)	1684/66430	1684/66430			
Min Ind Trade CR	Mobile radio with digital signal processing (2018–2021)	1705/67258	885/34911	522/20592		
Min Ind Trade CR	NANOTROTEX - Composite nanostructured electrode materials with textile matrix (2018–2021)	2620/103353	2600/102564	1285/50690		

Min Ind Trade CR	High-precision fiber collimator arrays (2018–2020)	1687/66548	1717/67732			
Min Ind Trade CR	Control Platform for High-Accuracy Microelectronics Assembly (2017–2021)	3120/123077	3198/126154	1639/64655		
Min Ind Trade CR	Real time video detection of persons in tunnels (2017–2019)	1349/53215				
Min Ind Trade CR	Automated system for spatial noise monitoring (2016–2019)	531/20947				
Min Ind Trade CR	Unit for large-scale plasma-based modification of materials surface properties (2016–2019)	278/10966				
Min Ind Trade CR	Analyzer of modal structure in optical components (2016–2019)	1880/74162				
Min Ind Trade CR	Support for increasing the impact, innovation and sustainability of CEDMO in the Czech Republic (2022–2025)				293/11565	503/19826
Min Edu Youth Sports CR	Research Infrastructure for Diachronic Czech Studies (2016–2019)	2611/102998				
Min Edu Youth Sports CR	Auto-ID technology and the Internet of Things to enhance the quality of health services (2017–2020)	1235/48718	770/30375			
Min Edu Youth Sports CR	National institute for Neurological Research (2022–2025)				619/24418	1291/50927
Min Edu Youth Sports CR	SACON - Smart Access Control for Smart Buildings (2019–2022)	1007/39724	1200/47337	1192/47022	200/7890	
Min Int CR	Detection of a carry improvised explosive devices (2017–2019)	663/26154				
Min Int CR	Comprehensive fiber optic sensor security of critical	1380/54438	271/10690			

	infrastructures and objects using modern information systems (2015–2020)					
Min Int CR	A set of forensic analytic tools for image and video processing for the criminal police and investigation service (2022–2025)				2272/89625	2272/89625
Min Int CR	Artificial Intelligence based SEarch Environment for photo/video (2022–2025)				1554/61302	1529/60316
Min Int CR	Monitoring the position of IRS members even during an intervention in large buildings using elements of artificial intelligence (2022–2025)				5707/225128	6165/243195
Min Int CR	AiDojo: Game-based testbed for rapid development of AI-driven cybersecurity (2022–2025)				2261/89191	2261/89191
Min Int CR	Automated system for critical infrastructure protection using cyber-physical technologies (2023–2025)					1901/74990
Min Health CR	Role of transposable elements and PIWI-interacting RNAs in myelodysplastic syndromes and their potential clinical applications (2020–2024)		262/10335	539/21262	643/25365	556/21933
Min Health CR	Operational tolerance in kidney transplantation (2019–2022)	236/9310	502/19803	502/19803	502/19803	
Min Health CR	Clinical, Imaging and Biological predictors of effects associated with deep brain stimulation in Parkinson's disease (2019–2023)	215/8481	349/13767	358/14122	287/11321	71/2801

Min Health CR	Evaluation of atherosclerotic plaque stability in carotids using digital image analysis of ultrasound images (2019–2023)	939/37041	1477/58264	1356/53491	1069/42170	544/21460
Min Health CR	Objective investigation of distinct speech phenotypes in newly diagnosed Parkinson's disease including effects of pharmacotherapy (2019–2022)	799/31519	1055/41617	981/38698	1129/44536	
Min Health CR	Integrative analysis of high-throughput genomics and multiparameter flow cytometry to improve diagnosis and monitoring of childhood acute leukemia (2018–2021)	252/9941	228/8994	289/11400		
Min Health CR	Functional and structural reorganization of brain networks after stroke: implications for diagnosis and therapy of associated comorbidities. (2017–2020)	985/38856	985/38856			
Min Health CR	System for Continuous Early Postoperative Monitoring of Kidney Graft Blood Perfusion (2016–2019)	721/28442				
Min Health CR	Long non-coding RNAs in myelodysplastic syndromes: clinical relevance and implication in the pathogenesis (2017–2021)	428/16884	422/16647			
TA CR	Advanced methods for on-board data processing in V2X systems (2022–2024)				2329/91874	2329/91874
TA CR	Digital twin for increased reliability and sustainability of concrete bridges (2022–2024)				2225/87771	2319/91479

TA CR	Automatic workplace for magnetic particle inspection of parts (2023–2026)					765/30178
TA CR	Development of measurement system for voice services quality provided by 5G+ networks (2023–2025)					1972/77791
TA CR	Research and development of self-cleaning technology for application to glass in architecture and interior decorative objects (2023–2025)					1829/72150
TA CR	Development of innovative biocompatible coatings preventing cold-welding effect (2023–2025)					977/38540
TA CR	Advanced technologies of microwave-photonics modules (2023–2025)					2001/78935
TA CR	Multichannel interconnection of photonic chips for high-speed optical networks 5G + (2023–2025)					1803/71124
TA CR	Communication optical module for microwave systems (2023–2025)					1350/53254
TA CR	Development of 5G + networks test system with multi-gigabit throughput and millimeter waves support (2023–2025)					2916/115030
TA CR	Fiber optic elements with new standards for optical connectors for safety-intensive applications (2023–2025)					1500/59172
TA CR	Advanced nano-optical elements on rigid planar and curved substrates for next-					1500/59172

	generation lighting systems (2023–2025)					
TA CR	Pre-charging unit for HCB or SSCB circuit breakers (2023–2024)					2260/89152
TA CR	Guidance and Localization upgrade creating Autonomous Mobile Robots (2021–2023)			2248/88679	2248/88679	2248/88679
TA CR	Monitoring of parameters of rocks disintegration of small and large in scale by fiber-optic sensors (2021–2023)			1500/59172	1500/59172	1500/59172
TA CR	Metrology and quality control of optical infrastructure of 5G and VHCN networks (2021–2023)			1255/49507	1332/52544	1288/50809
TA CR	Fiber optic resonator structures for sensoric systems (2021–2024)			1617/63787	1733/68363	1613/63629
TA CR	The Choice of Profession Orientation Based on Virtual Reality and Eye-tracking (2021–2024)			1689/66627	1811/71440	1725/68047
TA CR	Platform for reliable operation, provisioning and management of massive distributed IIoT structures (2021–2023)			2482/97909	2600/ 102564	2642/104221
TA CR	High Sensitive and Scalable Microbolometer Thermal Imaging Module with AI processing and High Resolution Sensor (2021–2023)			2459/97002	2341/92347	2318/91440
TA CR	Transferability of AI-based fraud-detection models to support expansion on foreign markets (2020–2022)		37/1460	1387/54714	228/8994	
TA CR	LED module technology for fiber		1762/69507	1849/72939	1938/76450	913/36016

	optic lighting (2020–2023)					
TA CR	Localization of sources of ionizing radiation using a group of small unmanned aircrafts with Compton camera detectors (2020–2022)		1435/56607	1507/59448	1420/56016	
TA CR	Precise positioning for autonomous train operation with secure communications on new 5G + network standards (2020–2022)		1639/64655	2667/ 105207	2711/ 106943	
TA CR	Detection of the Arc Fault in DC Applications (2020–2022)		1242/48994	1180/46548	1180/46548	
TA CR	Detection, identification and monitoring of animals by advanced computer vision methods. (2022–2024)				970/38264	970/38264
TA CR	Air quality Research, Assessment and Monitoring Integrated System (2020–2026)		113/4458	341/13452	1025/40434	1238/48836
TA CR	Center for Intelligent Drives and Advanced Machine Control (CIDAM) (2014–2019)	2188/86312				
TA CR	Centre for Advanced Nuclear Technologies (CANUT) (2012–2019)	3651/144024				
TA CR	V3C - Visual Computing Competence Center (2012–2019)	6600/260355				
TA CR	System for Situational Awareness Improvement and UAS Operation Management (2019–2021)	170/6706	413/16292	301/11874		
TA CR	Automated magnetizer for testing parts of complex shape by means of magnetic particle testing (2019–2021)	487/19211	487/19211	421/16607		

TA CR	System for implementing the concept of Mobility as a service into practice (2019–2021)	590/23274	725/28600	725/28600		
TA CR	Agroforestry systems for protection and restoration of landscape functions endangered by the effects of the climate change and human activity (2019–2022)	500/19724	500/19724	500/19724	500/19724	
TA CR	Apparatus for non-invasive automatic analysis of hemodynamic parameters (2019–2021)	822/32426	835/32939	953/37594		
TA CR	Virtual Prototyping and Validation of Electromagnetic Systems (2018–2021)	1597/62998	1248/49231	1204/47495		
TA CR	Micro and nanostructured waveguides for controlled distribution of light (2019–2021)	1199/47298	1188/46864	1121/44221		
TA CR	System for early prediction of failure modes of electro-mechanical actuators for aerospace (2019–2022)	2304/90888	2631/103787	1530/60355	1009/39803	
TA CR	Development of a cybernetic assistant for small arms for the increased probability and safety of hitting a target. (2018–2021)	954/37633	828/32663	81/3195		
TA CR	Intelligent public transport using V2X (2018–2020)	1100/43393	1100/43393			
TA CR	TRIOX | Advanced oxidation technology for water, disinfectants and environmental applications (2018–2020)	840/33136	840/33136			
TA CR	Absolute and relative positioning within 4th industrial revolution	519/20473	1275/50296	2391/94320		

	environment (2018–2021)					
TA CR	Integration the services for route planning and navigation system for the disabled with the city management systems and open data of cities (2018–2020)	1125/44379	1125/44379			
TA CR	MEMS ESO - MEMS sensors with optical scanning (2018–2021)	1608/63432	1719/67811	1908/75266		
TA CR	Hybrid navigation system for autonomous vehicles in environment with denied GNSS services (2018–2020)	839/33097	795/31361			
TA CR	The compact diagnostic system for operating high voltage condition monitoring of electrical machines using DC and low-frequency AC test voltage (2017–2019)	1161/45799				
TA CR	The Multichannel Communication Platform for the Internet of Things (IoT) (2017–2019)	1069/42170				
TA CR	Development of the methodology of estimation of interior heat parameters by the wood residental constructions, reduction of the energy intensity and environmental factors related of the reducing of the greenhouses gases (2017–2019)	1794/70769				
TA CR	New advanced integrated fiber optic connectors for demanding applications (2023–2025)					1904/75108
TA CR	Comprehensive environment for the development of energy communities -				995/39250	995/39250

	proposal of legislative, organizational and motivational measures to remove barriers to development (2022–2023)					
TA CR	Comprehensive solutions of local and regional energy systems as part of GreenDeal's measures to achieve sustainable agricultural and forestry management (2022–2024)				897/35385	1296/51124
TA CR	Energetic cable with added sensors to measure working parameters along the cable length on IoT principle to optimize transferred power and energetic loses (2020–2022)		713/28126	1538/60671	1538/60671	
TA CR	A comprehensive evaluation of potentials of the bioenergy development in relation to the landscape functions (2018–2021)	1136/44813	1029/40592	563/22209		
TA CR	Virtual digital wardrobe (2021–2023)			462/18225	908/35819	970/38264
TA CR	Artificial intelligence and human rights: risks, opportunities and regulation (2021–2023)			340/13412	525/20710	380/14990
TA CR	The Signal and the Noise in the Era of Journalism 5.0 - A Comparative Perspective of Journalistic Genres of Automated Content (2021–2023)			553/21815	1140/44970	1290/50888
TA CR	Arts and design as solution of traffic changes connected to ascent of autonomous driving (2020–2023)		93/3669	155/6114	155/6114	155/6114
TA CR	Transformation of Journalisms Ethics in	749/29546	1555/61341	1241/48955		

	the Advent of Artificial Intelligence (2019–2021)					
TA CR	Historylab: using technology to foster historical literacy (2018–2021)	1229/48481	1229/48481	205/8087		
TA CR	Development of autonomous driving smart air cleaner and safety control services platform for improving indoor air quality(IAQ) in industrial and public sites (2023–2025)					2375/93688
TA CR	Risk-Aware Trajectory Planning and Optical Image Recognition Assisted Landing System for Fixed-Wing UAVs (2022–2024)				408/16095	995/39250
TA CR	Development of correlative AFM and SEM/AirSEM microscope (2022–2025)				1675/66075	3118/122998
TA CR	Biorefining and circular economy for sustainability (2023–2028)					3107/122564
TA CR	Center for advanced machines and manufacturing technology (2023–2028)					1700/67061
TA CR	Biorefining as circulation technology (2019–2022)	2034/80237	2120/83629	2119/83590	1442/56884	
TA CR	Newsroom AI: public service in the era of automated journalism (2023–2026)					73/2880
EC	Central European Digital Media Observatory (2021–2024)			504/19882	2100/82840	2307/91006
EC	Novel energy and propulsion systems for air dominance (2023–2025)					1093/43111

EC	Digital Transformations for Supporting Next-Generation Labour (2023–2026)					65/2564
EC	New Rules for Assessing Mathematical Competencies (2017–2020)	334/13176	114/4497	169/6667		
EC	Trustworthy Planning and Scheduling with Learning and Explanations (2023–2026)					1732/68315
EC	COMBATTING DIET RELATED NON-COMMUNICABLE DISEASE THROUGH ENHANCED SURVEILLANCE (2022–2026)				3/133	3469/136858
EC	Acoustic and Thermal Retrofit of Office Building Stock in EU (2022–2026)				25/976	205/8074
EC	Development of an efficient steganalysis framework for uncovering hidden data in digital media (2021–2024)			600/23669	1433/56529	885/34911
EC	RoboRoyale: ROBOtic Replicants for Optimizing the Yield by Augmenting Living Ecosystems (2021–2026)			98/3866	1123/44300	3300/130178
EC	MSCA-RISE-2020 - Research and Innovation Staff Exchange (2021–2025)				464/18317	19/768
EC	GaN for Advanced Power Applications (2021–2023)				1026/40473	990/39053
EC	New metrological methods for biofuel materials analysis (2020–2023)		404/15937	324/12781	385/15187	185/7298
EC	AERIAL COgnitive integrated multi-task Robotic system with		2488/98146	4271/ 168481	4416/ 174201	1780/70211

	Extended operation range and safety (2020–2023)					
EC	Integrated Activities for the High Energy Astrophysics Domain (2020–2024)		533/21019	580/22893	704/27765	920/36304
EC	European Training Network on Visible light based Interoperability and Networking (2017–2021)	3746/147771	3724/146903	565/22288		
EC	Unlocking Large-Scale Access to Combined Mobility through a European MaaS Network (2017–2019)	2797/110320				
EC	Wide band gap Innovative SiC for Advanced Power (2017–2020)	955/37654				
EC	Controller Tools and Team Organisation for the Provision of Separation in Air Traffic Management (2016–2019)	765/30187				
EC	SOLUTION - Solid lubrication for emerging engineering applications (2017–2021)	2889/113964	2476/97673	85/3353		
EC	Enabling seamless electromobility through smart vehicle-grid integration (2016–2019)	1444/56963				
EC	Energy for Smart Objects (2016–2019)	5872/231649				
EC	European initiative to enable validation for highly automated safe and secure systems (2016–2019)	945/37274				
EC	Integrated Activities for the High Energy Astrophysics Domain (2015–2019)	152/5996	162/6391			

EC	Certification of clean energy SMEs (2022–2025)				78/3095	1796/70862
EC	DNS4EU and European DNS Shield (2023–2025)					1553/61279
EC	Support to the preparation of territorial Just Transition Plans in Czech Republic (2020–2021)		112/4418	575/22682		
ESF through Min Ind Trade CR	RESEARCH OF THE INFLUENCE OF USED COMPONENTS ON THE LED CHIP IN THE FRAMEWORK OF THE DEVELOPMENT OF A NEW LED MODULE, INTENDED FOR DEMANDING APPLICATIONS IN THE CHEMICAL INDUSTRY (–)				3558/ 140355	
ESF through Min Ind Trade CR	Univerzální bezpečnostní platforma pro budovy, infrastrukturu a průmysl (2020–2022)		595/23471	1572/62012	1487/58659	
ESF through Min Ind Trade CR	Safety analysis of collaborative robots applications (2020–2022)		20/789	781/30809	960/37870	
ESF through Min Ind Trade CR	Innovative charging station with GaN transistors (2019–2022)			1326/52308	1435/56607	2292/90414
ESF through Min Edu Youth Sports CR	Langweilův model jako školní historický pramen (2019–)		582/22959	1652/65168	1900/74951	
ESF through Min Edu Youth Sports CR	Podpora učitelům (2018–2021)	1216/47968	1189/46903	498/19645		
ESF through Min Edu Youth Sports CR	Inovace VOV_zdravotnická oblast (2018–2021)	1638/64615	1551/61183	917/36174		
ESF through Min Edu	VOV - ekonomická sekce (2018–2021)	1512/59645	1712/67535	603/23787		

Youth Sports CR						
ESF through Min Edu Youth Sports CR	Inovace VOV_pedagogická oblast (2018–2021)	903/35621	781/30809	282/11124		
ESF through Min Edu Youth Sports CR	Inovace VOV_technická oblast (2018–2021)	3200/126233	3343/131874	3065/ 120907		
ESF through Min Edu Youth Sports CR	Research Center of Cosmic Rays and Radiation Events in the Atmosphere (2016–2023)			25087/ 989625		
ESA	IR Polarization Camera and Acousto-Optic Tuneable Filter for Hyperspectral Imaging Development for LWIR Applications - Phase 1 (2023–2025)					257/10148
ESA	Development and Verification of Earth-Space Statistical Clutter Loss Model (2021–2021)		106/4181	792/31243	519/20473	
(other foreign provider)	Towards a true 8-digit digitiser (2023–2026)					126/4959
(other foreign provider)	Ekologické transformátorové oleje - alternativní izolační kapaliny (2017–2020)	390/15365	126/4967			
(other foreign provider)	Remote Control of Robot in Inter-connected 5G Testbeds in Prague and Munich (2022–2023)					341/13442
(other foreign provider)	Connection of the two 5G testbeds in Prague and Munich (2022–2022)				186/7320	
(other foreign provider)	Flexible and Resilient Autonomus Systems (2018–2023)	1497/59042	1771/69842	2238/88272	4728/ 186492	3253/128305
(other foreign provider)	Climate investment capacity (CIC): climate finance dynamics&structure	588/23207	1316/51904	420/16551		

	for financing the 2030 targets (2018–2021)					
(other foreign provider)	Defeating the Dark Triad in Cyber Security Using Game Theory (2016–2019)	337/13290	115/4554	1726/68087	870/34308	434/17126
Total		**105986/ 4180907**	**85364/ 3367416**	**112278/ 4429112**	**92902/ 3664773**	**108231/ 4269467**

Table 3.3.2 - Contract research activities

Client[29]	Activity name	Revenue (in thousands CZK/EUR)				
		2019	2020	2021	2022	2023
ABB, Semiconductors	Charakterizace výkonových diod	112/4430				
ABB, Semiconductors	CV analýza křemíkových desek	80/3160				
Eurosecur s.r.o.	Eurosecur: Vývoj modulárního dronu	2230/87968				
ATE Cheb	ATE Cheb	105/4157				
AVAST Software s.r.o.	Aposemat project	1143/45088				
AVAST Software s.r.o.	Avast AI and Cybersecurity Laboratory at FEE CTU - AAICL	781/30792				
AŽD Praha	Modelování a analýza neohraničených kolejových obvodů	104/4102				
AŽD Praha	Ověření kybernetické bezpečnosti	636/25081				
AŽD Praha	Konzultační činnost a technická asistence	100/3940				
	Mobile Edge Computing and Functional Splitting for Scheduling of Radio Resources	2543/100307				
BREMA, spol. s r.o.	Expertiza a měření pohonů eskalátorů metra	290/11440				
BRISK Tábor a.s.	Diagnostika příčiny iontové migrace	150/5917				
Brownline Nizozemi	Fine alignment as a part of the North seeking	128/5038				

[29] If the client is from abroad, indicate in brackets the country of origin of the client.

CESNET z.s.p.o.	CESNET: Systém a metodologie snímání historických objektů bezpilotními helikoptérami a přenos nasnímaných velkých objemů dat pro jejich odborné zpracování	117/4603				
CETIN - Česká telekomunikační infrastruktura a.s.	Analýza operačních rizik na telekomunikační infrastruktuře	1270/50081				
CETIN - Česká telekomunikační infrastruktura a.s.	Zhotovení software	2370/93491				
CZ Biom Praha	Studie ekonomiky bioplynových stanic	200/7890				
Český svaz kanoistů, z.s.	Shotclock	295/11637				
Český metrologický institut	Návrh a realizace elektronických obvodů aktivních koaxiálních tlumivek včetně nabíjecího managementu	78/3077				
Ředitelství vodních cest ČR	RIS COMEX -Napájecí systém pro elektronické vybavení říční bóje charakteru ATON	300/11834				
Český telekomunikační úřad	Technický audit cenové kalkulačky	91/3570				
DELTA ADVISORY a.s.	Zpracování metodik tvorby nástrojů pro implementaci Národní strategie elektronického zdravotnictví	370/14596				
dis5 Praha	Technicko-ekonomická analýza zabezpečení dat	98/3866				
Dopravní podnik hl. města Prahy	Metodika testů systému určování polohy	398/15711				
ENISA - Finance Unit	Stratosphere Proposal for Study on Encrpted Traffic Analysis for ENISA	377/14853				
Grant Thornton Advisory s.r.o.	Konzultace pro projekt NGA	83/3254				
KOMIX s.r.o.	Podpora a úpravy AIS SE	371/14623				
KOPR Praha	Měření mg. pole při svařování Bosal	65/2564				

Faurecia Emission Technologies GmbH	Magnetic field measurement at Jasza plant	133/5238				
Faurecia Emission Technologies GmbH	Magnetic field measurement at Augsburg plant	121/4787				
Faurecia Emission Technologies GmbH	Measurement of magnetic field during welding process at Faurecia Plant/Heilbronn.	167/6598				
Mapradix s.r.o.	Multi-resolution Processor	431/17003				
Markify AB	Consultation services on the topic of "discovery of similar trademarks"	77/3031				
Medicton Polička	Analýza očních pohybů	220/8679				
Mendelova univerzita v Brně / Lesnická a dřevařská fakulta	Práce dle harmonogramu projektu č. FVF40031“Viceúčelový modulární systém těžby pařezů a dalších komodit (Zdroj: 2503 SPP prvek: OV4190021)	93/3651				
Misterine s.r.o.	Projekt V.I.P.E.R.	203/8027				
MPO Praha	Posouzení a vyhodnocení přiměřenosti poskytování provozní podpory elektřiny u výroben uvedených do provozu v roce 2009 podle závazků v rozhodnutí Evropské komise o slučitelnosti podpory s vnitřním trhem EU - 1. etapa	250/9862				
Khalifa University of Science and Technology	MBZIRC: MOHAMMED BIN ZAYED INTERNATIONALL ROBOTICS CHALLENGE 2020	505/19939				
Masarykova univerzita / Ústav výpočetní techniky	Analýza, návrh řešení simulací v laboratoři pro AMM/SG technologie instalované v distribuční soustavě	492/19391				
PREdistribuce, a.s.	Vyhodnocení datové komunikace v pilotních projektech AMM	180/7101				
PREdistribuce, a.s.	Analýza provozu bezdrátových komunikací	122/4828				

PREdistribuce, a.s.	Vyhodnocení datové komunikace v pilotních projektech AMM	109/4292				
PREdistribuce, a.s.	Návrh koncepce pro hl. m. Prahu	295/11637				
Facesoft Ltd	Consultation services on the topic of "efficient nearest neighbour search in high dimensional spaces""	72/2828				
Software Competence Center Hagenberg	SCCH Rakousko FExFE	663/26150				
Schaeffler Technologies A.G. & Co. KG	Evaluation of material transfer (coverage, thickness, volume) on both parts of sliding couple	112/4403				
SEVEN Energy s.r.o.	Mapování potenciálu biomasy pro Olomoucký kraj - 1. etapa	200/7890				
Synergy Logistics Limited of Synergy House	Implemetnation of a vision-based navigation system, capable of learning a set of paths via tele-operation and report its position with accuracy	402/15864				
dpstar Thermo Control Electric	Testování integrovaných obvodů	423/16695				
UNIS, spol. s r.o.	Simulace manuálního měření frekvenční charakteristiky řízeného systému	50/1972				
UNIS, spol. s r.o.	Simulace manuálního měření frekveční charakteristiky řízeného systému, část II.	50/1972				
UNIS, spol. s r.o.	Citlivostní a frekveční analýza, analýza pracovních oblastí motoru	50/1972				
ÚNMZ - Úřad pro technickou normalizaci, metrologii a státní zkušebnictví	Vývoj vn měřicích metod pro ÚNMZ	165/6520				
Ústav teoretické a aplikované mechaniky Akademie v	Ontologický model formulářů pro sběr dat šablony CONSEH20	57/2233				

Ředitelství vodních cest ČR	Analýza přesné satelitní navigace malých plovoucích objektů na říčních úsecích vodních cest - RIS COMEX	136/5365				
Whalebone Brno	Výzkum a vývoj algoritmů pro detekci a blokaci závadného DNS provozu	206/8137				
WTtech.CZ s.r.o.	Robotický manipulátor	130/5128				
Mendelova univerzita v Brně / Lesnická a dřevařská fakulta	Práce dle harmonogramu projektu pro GS LESY ČR č. 4: Metody likvidace kůrovce založené na účinku elektrického proudu. (Zdroj: 9510 SPP prvek: SV4190021)	208/8216				
CNR (Czech) Science and Technology Development Corporation Limited s.r.o	130028C000 K13114 CNR (CZECH) sp.lab.JC	1728/68166				
ATE Cheb	ATE Cheb		90/3532			
AVAST Software s.r.o.	Avast AI and Cybersecurity Laboratory at FEE CTU - AAICL		3807/150195			
Aveco s.r.o.	Vývoj zařízení pro Aveco Praha		219/8634			
Avekon Praha	Měření činitele směrové difuze a zvukové pohltivosti		50/1980			
BeiT s.r.o.	Vývoj zařízení pro BEIT Praha		211/8314			
BeiT s.r.o.	Vývoj zařízení pro BEIT Praha		469/18498			
CESNET z.s.p.o.	CESNET: Systém a metodologie snímání historických objektů bezpilotními helikoptérami a přenos nasnímaných velkých objemů dat pro jejich odborné zpracování		146/5772			
CETIN - Česká telekomunikační infrastruktura a.s.	Zhotovení software		3298/130099			
Czech CRRC Science and Technology Devel.s.r.o.	8302006C000 CRRC osobní		1407/55515			

Czech CRRC Science and Technology Devel.s.r.o.	8302007C000 CRRC sp. lab. JC		1728/68166			
Český metrologický institut	Vývoj a výroba magnetického kompenzačního systému		61/2406			
Český telekomunikační úřad	Sestava 3 ks zařízení F-Tester včetně příslušenství a HW a SW úpravy		199/7861			
Český telekomunikační úřad	SW modul pro skenování WiFi		66/2604			
Elektrotechnika, a.s.	Tokamak Compass U - model		284/11203			
Elektrotechnika, a.s.	Tokamak Compass U - výpočty		284/11195			
Energetický regulační úřad	Zajištění činností projektového managementu v rámci projektu „Majetek včetně odpisů a WACC“		295/11637			
Euroenergy, spol. s r.o.	Analýzy vstupních parametrů dle Zásad cenové regulace a zajištění simulačních výpočtů regulovaných cen v elektroenergetice pro rok 2021		950/37475			
Faurecia Emission Technologies GmbH	Magnetic field analysis and measurement at Faurecia Bezdecin		80/3138			
Funny Fish, s.r.o.	Vývoj zařízení pro Funny Fish Praha		499/19684			
HUAWEI TECHNOLOGIES OY(FINLAND) CO. LTD	RESEARCH & DEVELOPMENT AGREEMENT		395/15579			
Logiline Einkauf GmbH	Magnetic field measurement at Faurecia plant		137/5393			
Faurecia Emission Technologies GmbH	Magnetic field measurement at Faurecia Bakov plant		78/3094			
Markify AB	Consultation services on the topic of “discovery of similar trademarks"		131/5178			

Mendelova univerzita v Brně / Lesnická a dřevařská fakulta	Smluvní výzkum pro Menedelovu univerzitu		169/6651			
MPO Praha	Posouzení a vyhodnocení přiměřenosti poskytování provozní podpory elektřiny u výroben uvedených do provozu v roce 2009 podle závazků v rozhodnutí Evropské komise o slučitelnosti podpory s vnitřním trhem EU - 1. etapa		210/8284			
Khalifa University of Science and Technology	MBZIRC: MOHAMMED BIN ZAYED INTERNATIONALL ROBOTICS CHALLENGE 2020		3535/139440			
MŽP Praha	Smluvní výzkum pro MŽP		160/6311			
PREdistribuce, a.s.	Vyhodnocení datové komunikace v pilotních projektech AMM		51/2020			
PREdistribuce, a.s.	Hodnocení pilotních projektů AMM - SEGW		192/7574			
PREdistribuce, a.s.	Metodika ukončování vláken optických kabelů		240/9467			
PROFiber Networking CZ, s.r.o.	Zařízení F-tester		114/4485			
Software Competence Center Hagenberg	SCCH Rakousko FExFE		259/10211			
Sensority, s.r.o.	Vývoj zařízení pro Sensority Praha		499/19696			
Sensority, s.r.o.	Vývoj zařízení pro Sensority Praha		50/1972			
SEVEN Energy s.r.o.	Mapování potenciálu biomasy pro Olomoucký kraj - 1. etapa		130/5128			
Státní fond životního prostředí	Model FV systému		50/1972			
Technology Innovation Institute	TII Abu Dhabi I		79/3124			
ÚNMZ - Úřad pro technickou	Smluvní výzkum pro UNMZ		215/8476			

normalizaci, metrologii a státní zkušebnictví						
Ústav teoretické a aplikované mechaniky Akademie v	Ontologický model formulářů pro sběr dat šablony CONSEH20		58/2304			
Vitesco Technologies Czech Republic s.r.o.	Elektrochemická migrace na DPS		100/3945			
Funny Fish, s.r.o.	Vývoj zařízení pro Funny Fish Praha		500/19721			
Sensority, s.r.o.	Vývoj zařízení pro Sensority Praha		498/19659			
Akustika Praha, s.r.o.	Analýza možnosti úniku akustických informací šířených konstrukcemi budov			113/4446		
ATE, a.s.	Vývoj a výroba vzorků			250/9862		
BeiT s.r.o.	Vývoj zařízení pro BEIT Praha			289/11386		
CETIN - Česká telekomunikační infrastruktura a.s.	Zhotovení software			2802/110517		
CLIMCOM Berlin–Climate & Company Advisory Services	Financing the European Green Recovery – Addressing barriers and opportunities of the new EU financial framework			364/14373		
Colsys s.r.o.	Analýzy dodaných podkladů a konzultace v problematice UHF RFID			150/5917		
CoolTherm, s.r.o.	Analýza sériové komunikace			50/1972		
Czech CRRC Science and Technology Devel.s.r.o.	8302006C000 CRRC osobní			854/33672		
Czech CRRC Science and Technology Devel.s.r.o.	8302007C000 CRRC sp. lab. JC			1728/68166		
Český telekomunikační úřad	Smlouva o zpracování znaleckých posudků na ocenění rádiových kmitočtů			546/21538		

	v pásmech 1920–1980 / 2110–2170 MHz, 28,2205–28,4445 GHz a 29,2285–29,4525 GHz					
CZ Biom – České sdružení pro biomasu, z.s.	Studie ekonomiky bioenergetiky			300/11834		
Český metrologický institut	Vývoj a výroba magnetického kompenzačního systému			149/5878		
Deloitte Advisory s.r.o.	VR Space Escape Room Experience			735/29001		
Ernst & Young, s.r.o.	Konzultace k Výsledkové tematické evaluaci Dohody o partnerství pro programové období 2014-2020			58/2268		
Euroenergy, spol. s r.o.	Zpracování typových diagramů dodávek plynu pro rok 2022.			730/28797		
Euroenergy, spol. s r.o.	Zajištění subdodávky projektového managementu			200/7890		
Euroenergy, spol. s r.o.	Analýzy vstupních parametrů dle Zásad cenové regulace a zajištění simulačních výpočtů regulovaných cen v elektroenergetice pro rok 2021			740/29191		
CETIN - Česká telekomunikační infrastruktura a.s.	F-Tester 4drive-box 5G			472/18619		
Český telekomunikační úřad	Dodávka analyzátorů kvalitativních parametrů v mobilních sítích			877/34593		
HUAWEI TECHNOLOGIES OY(FINLAND) CO. LTD	RESEARCH & DEVELOPMENT AGREEMENT			523/20649		
Kolibrik.net, s.r.o.	Návrh a vývoj čtyřkanálového digitalizátoru využívacící sigma-delta převodníky se frekvencí vzorkování 2,5 MSPS			280/11045		
Ministerstvo průmyslu a obchodu ČR	Posouzení a vyhodnocení přiměřenosti poskytování provozní podpory elektřiny			130/5128		

	u výroben uvedených do provozu v roce 2009 podle závazků v rozhodnutí Evropské komise o slučitelnosti podpory s vnitřním trhem EU - doplnění					
Nave France	Visual Representation learning and matching for object and action recognition			696/27458		
PRO - ZETA, a.s.	Osazování a výroba vzorků			55/2180		
Univerzita Karlova v Praze / Přírodovědecká fakulta	Vývoj a dodání páru tříosého fluxgate magnetometru pro měření na UAV			149/5868		
Software Competence Center Hagenberg	SCCH Rakousko FExFE			254/10037		
SCILIF s.r.o.	Nové řídicí jednotky pro výrobky firmy Scilif			410/16174		
Sorbenta NT	Analýza a experimentální měření vlivu kompozitových materiálů na omezení průniku RF signálu			2509/98970		
Stellenbosch University	Development and manufacturing of a low noise magnetic variometer			129/5098		
Technology Innovation Institute	TII Abu Dhabi I			1645/64888		
Technology Innovation Institute	TII Abu Dhabi II - Catamarans (TII-CTU - UAV-USV)			386/15237		
Ústav teoretické a aplikované mechaniky Akademie v	Ontologický model formulářů pro sběr dat šablony CENSEH20			96/3787		
Vysoká škola báňská - Technická univerzita Ostrava / Fakulta elektrotechniky a informatiky	Studie proveditelnosti vlastní sítě LTE			120/4734		
Akustika Praha, s.r.o.	Analýza možnosti úniku akustických informací				128/5037	

	šířených konstrukcemi budov – II. etapa					
ALIS Tech s.r.o.	Metody UWB pro určování polohy objektů				349/13758	
ATE Cheb	Vývojové práce pro ATE Cheb				250/9862	
Aveco s.r.o.	Vývojové práce pro společnost AVECO				112/4433	
Aveco s.r.o.	Zakázka AVECO Praha				237/9331	
AVETON s.r.o.	Měření činitele směrové difuze a zvukové pohltivosti				89/3511	
BeiT s.r.o.	Zakázka pro BeiT s.r.o.				300/11815	
CETIN - Česká telekomunikační infrastruktura a.s.	Zhotovení software				3862/152363	
Com - Pakt Energy, a.s.	Studie Kabelové vedení V205/206 400 kV				60/2367	
Czech CRRC Science and Technology Devel.s.r.o.	8302006C000 CRRC osobní				939/37045	
Czech CRRC Science and Technology Devel.s.r.o.	8302007C000 CRRC sp. lab. JC				1728/68166	
CZ Biom – České sdružení pro biomasu, z.s.	Studie ekonomiky bioenergetiky				300/11834	
ČEPS, a.s.	Posouzení metodiky vyhodnocení přínosů snížení rizik				140/5523	
ČEPS, a.s.	Studie proveditelnosti - Monitoring optických spojkových krabic				230/9073	
ČEPS, a.s.	Studie Stanovení ceny v prostředí trhu se SVR				200/7890	
Český rozhlas	Vývoj a realizace SW pro digitalizaci archivních fotomateriálů				120/4734	
Decci servis s.r.o.	Konzultace v oblasti fotovoltaiky				420/16568	
Dekonta, a.s.	Diagnostika baterií				62/2456	

Deloitte Advisory s.r.o.	VR Space Escape Room Experience				223/8789	
ECORETAN s.r.o.	Konfigurace mikrovlnného reaktoru pro ohřev směsi etykenglykolů				72/2840	
Enginn Effect	Vývojové práce na 3D grafickém jádře softwaru VRUT				922/36364	
Energetický regulační úřad	Analýza technicko - ekonomických parametrů pro stanovení výše podpory v cenovém rozhodnutí				100/3945	
Euroenergy, spol. s r.o.	Subdodávky činností projektového managementu v rámci projektu ERÚ - nová tarifní soustava				200/7890	
Euroenergy, spol. s r.o.	Potenciál vývoje bioplynových zdrojů do roku 2050				80/3156	
Euroenergy, spol. s r.o.	Analýza vstupních parametrů dle Zásad cenové regulace a zajištění simulačních výpočtů regulovaných cen v elektroenergetice pro rok 2023				490/19329	
Euroenergy, spol. s r.o.	Odhad vývoje biometanu do roku 2040				110/4339	
Euroenergy, spol. s r.o.	Zpracování typových diagramů dodávek plynu pro jednotlivé kalendářní roky 2022–2023				730/28797	
Euroenergy, spol. s r.o.	Studie „ZMĚNA CENOTVORBY NA NAPĚŤOVÝCH HLADINÁCH VVN A VN“				180/7101	
Český telekomunikační úřad	Dodávka analyzátorů kvalitativních parametrů v mobilních sítích				3344/131916	
itSound, s.r.o.	Analýza vibrací povrchu reproduktorové soustavy				170/6706	
itSound, s.r.o.	Změření amplitudové a fázové frekvenční charakteristiky soustavy				70/2761	
Ministerstvo průmyslu a obchodu ČR	Posouzení a vyhodnocení sektorového šetření přiměřenosti provozní podpory elektřiny u				345/13609	

	výroben uvedených do provozu v roce 2010 podle zákona č. 165/2012 Sb., o podporovaných zdrojích energie					
Ministerstvo průmyslu a obchodu ČR	Oponentní posudek k nastavení výše podpory pro aktivitu "Modernizaci distribuce tepla v rámci soustav zásobování teplem"				120/4734	
Ministerstvo průmyslu a obchodu ČR	Zpracování posouzení a vyhodnocení sektorového šetření přiměřenosti provozní podpory elektřiny u výroben uvedených do provozu v letech 2011 - 2015 podle zákona č. 165/2012 Sb., o podporovaných zdrojích energie rozhodnutí				230/9073	
Nave France	Visual Representation learning and matching for object and action recognition				942/37140	
PiKRON, s.r.o.	Návrh měřicí aparatury pro plně automatizované testy a provedení statických a dynamických testů předložených A/D převodníků -				56/2219	
Realistic a.s.	Dohoda o podmínkách spolupráce při realizaci projektu vývoje mikrovlnné tunelové sušárny a výzkumu nastavení mikrovlnného záření na různé druhy keramických a stavebních materiálů				200/7890	
REMA PV Systém, a.s.	Studie znovuvyužití PV modulů				138/5444	
RFspin, s.r.o.	Near Field to Far Field Transformation for Near-Field Scanning System				80/3156	
	Technology Development and Licence Agreement s Rio Algom Exploration Inc.				655/25841	
Rohde&Schwarz Vimperk s.r.o.	Testování pájitelnosti povrchů desek plošných spojů				80/3156	
Software Competence	SCCH Rakousko FExFE				243/9580	

Center Hagenberg						
Sorbenta NT	Analýza a experimentální měření vlivu kompozitových materiálů na omezení průniku RF signálu				2347/92592	
STRATOSYST s.r.o.	Vývoj funkčního vzorku systému zajišťující telekomunikační úlohy				1500/59172	
Státní fond životního prostředí České republiky	Podmínky a výpočetní nástroj NZÚ				98/3850	
Testia Consult	Životnostní zkoušky vzorků vinutí				106/4181	
Technology Innovation Institute	TII Abu Dhabi I				1342/52958	
Technology Innovation Institute	TII Abu Dhabi II - Catamarans (TII-CTU - UAV-USV)				783/30886	
PROFiber Networking CZ, s.r.o.	Vývoj a dodání F-Tester 5G				74/2910	
Aveco s.r.o.	Zakázka AVECO Praha					255/10072
EPSA Market Place Romania S.R.L	EPSTOP Project – Consultancy services					184/7275
CETIN - Česká telekomunikační infrastruktura a.s.	Zhotovení software					3031/119565
CRRC Čína	Electric Drive Diagnostics					2100/82840
CZ Biom – České sdružení pro biomasu, z.s.	Studie ekonomiky bioenergetiky					360/14201
Decci servis Praha	Expertní a poradenská činnost v oblasti diagnostiky řízení a provozu velkých fotovoltaických systémů					420/16568
Ernst & Young, s.r.o.	Konzultace k Výsledkové tematické evaluaci Dohody o partnerství pro programové období 2014-2020					52/2041

Euroenergy, spol. s r.o.	Subdodávky činností projektového managementu v rámci projektu Energetického regulačního úřadu ohledně propojení nového designu trhu v elektroenergetice s požadavky na změny v regulovaných cenách a tarifech					110/4339
EZÚ Praha	Zkoušky dle ČSN EN 62561-1 ed.2:2017					230/9067
Frankfurt School	REFORM/SC2022/116 - "Support to the Implementation of the Just Transition in the Czech Republic"					522/20605
Fyzikální ústav AV ČR, v. v. i.	Příprava elektricky vodivých senzorových nanovrstev					62/2462
Garrett Motion	Spolupráce a případné konzultace na vývoji					60/2367
INOX Technology	Magnetická měření a konzultace BOSAL / IINOX technology					80/3156
IOZ	Tvorba výukových materiálů pro kurz "Elektromontér fotovoltaických systémů" (26-014-H)					65/2564
MAN	Off-line LiDAR and Camera System Calibration Software					415/16351
Mapradix s.r.o.	Enhanced Spatiotemporal Land Change Monitoring Based on Sentinel-2 Time Series and VHR Images					625/24664
Markify AB	Consultation services on the topic of “discovery of similar trademarks”					178/7028
Ministerstvo průmyslu a obchodu ČR	Zpracování posouzení a vyhodnocení sektorového šetření přiměřenosti provozní podpory elektřiny u výroben uvedených do provozu v letech 2011 - 2015 podle zákona č. 165/2012 Sb., o podporovaných zdrojích energie rozhodnutí					230/9073
Naver France	Visual Representation learning and matching for					774/30550

	object and action recognition					
TERMS	Terms a.s. - Roboton					820/32347
Povodí Ohře, státní podnik	Studie stavebně-technologického řešení					100/3945
PREdistribuce, a.s.	Demonstrátor HAN					240/9467
Realistic a.s.	Dohoda o podmínkách spolupráce při realizaci projektu vývoje mikrovlnné tunelové sušárny a výzkumu nastavení mikrovlnného záření na různé druhy keramických a stavebních materiálů					200/7890
Software Competence Center Hagenberg	SCCH Rakousko FExFE					397/15672
Sensority, s.r.o.	Realizace vzorků					300/11842
Sorbenta NT	Analýza a experimentální měření vlivu kompozitových materiálů na omezení průniku RF signálu					1834/72357
STRATOSYST s.r.o.	Vývoj funkčního vzorku systému zajišťující telekomunikační úlohy					3000/118343
Technology Innovation Institute	TII Abu Dhabi I					16104/635267
Technology Innovation Institute	TII Abu Dhabi II - Catamarans (TII-CTU - UAV-USV)					14068/554966
URC Systems, spol. s r.o.	Vývoj a dodávka F-Tester 5G					75/2943
Sensority, s.r.o.	Realizace vzorků pro firmu Sensority					72/2838
AXIS	Testování použití kamer Axis na robotických platformách					75/2959
Czech Hydro s.r.o.	Posouzení důvodnosti zachování podpory pro špičkové MVE v režimu vysokého a nízkého tarifu					100/3945
Siemens, s.r.o.	Analýza desek PCB					50/1972

Brema, spol. s r.o.	Měření a analýza esk na stanicích BU, HA, MU					83/3266
RFspin, s.r.o.	Měření základních parametrů širokopásmových antén, hybridních členů					220/8679
Euroenergy, spol. s r.o.	Zpracování typových diagramů dodávek plynu pro jednotlivé kalendářní roky 2024-2026					400/15779
PREdistribuce, a. s.	Ucelený návrh SW pro frekvenční měniče					250/9862
Undisclosed Clients (271)	Various Titles	48094/ 1897194	35498/ 1400324	30483/ 1639145	41552/ 1639145	46036/ 1816026
Small Contracts (463)	Various Titles	1622/64004	1672/65951	1572/62006	1107/43690	774/30539
Total		**72649/ 2865838**	**59163/ 2333846**	**50844/ 2005680**	**68214/ 2690888**	**94953/ 3745680**

Note: List and describe contract research activities with a revenue in a given calendar year, regardless of the amount of financial revenue.

3.4 Research results with existing or prospective impact on society

The evaluated unit shall briefly comment on a maximum of 10 (considered most significant by the evaluated unit) research results already applied or realistically heading towards application during the period of 2019–2023, based on the overview annex table 3.4.1 (it is recommended to indicate results with a link to projects listed in indicator 3.3). The evaluated unit must demonstrate in its description that the research results have led or will soon lead to positive impacts[30], on society (e.g. description of how the results are used by various users, the range of persons/institutions for which the result is relevant, measurable economic impacts, etc.). The evaluated entity shall indicate in its commentary whether the gender dimension is considered in these results and discuss the impacts of the results regarding sustainability.

Maximum range 300 words/result.

Self-assessment: During the evaluated period, a total of 216 research outcomes were reported, including 62 patents, 81 software applications, 23 prototypes, 4 pilot plants, 36 utility models, 1 result incorporated into legislation and standards, 1 result reflected in agreed strategy and policy documents, and 8 certified methodologies. Additionally, during this period, the total value of licenses sold exceeded 2.65 million CZK.

Generally speaking the nature of the selected results primarily revolves around technical, mathematical, and engineering advancements, where gender as a variable does not directly influence the methodologies or outcomes. The technology is designed for all users, ensuring accessibility without gender bias. It should be emphasized, though, that one of the selected technical results detailed below addresses the gender and equality concerns directly. A NATO STO sponsored grant on gender aspects of secure low-bit-rate voice communication gave rise to the result “Gender-related aspects of listening quality and effort in speech communication systems”, reflected in a technical recommendation from the European Telecommunications Standards Institute (ETSI). It

[30] See Terms definition.

provides guidelines on test procedures and measures for human speech communication systems to balance transmission quality among genders.

The evaluated research outputs significantly contribute to sustainability through technological efficiency, environmental monitoring, healthcare innovation, and creative digitalization, demonstrating their broad societal impact.

Hierarchical resource scheduling method of wireless communication system

(2020, Patent, US10849139 and US10624105)
https://patents.google.com/patent/US10849139B2/en
https://patents.google.com/patent/US10624105B2/en
This patent addresses the challenge of fronthaul delay in cloud radio access network (C-RAN) architecture, a key component of current and future mobile networks. In C-RAN, base station functions are split between distributed units (remote radio heads) and a centralized baseband unit. The fronthaul connection between them introduces delays, negatively impacting radio resource management, such as scheduling. Since scheduling relies on real-time channel quality information, any delay results in outdated data, reducing user throughput by several to dozens of percent. The patent introduces a hierarchical scheduling framework that mitigates this issue by dynamically distributing scheduling tasks between centralized and distributed units. The centralized unit prioritizes scheduling for cell-edge users, who experience inter-cell interference, while distributed units handle resource allocation for non-cell-edge users. The classification of users is dynamically adjusted based on network conditions, user mobility, and quality of service requirements. This approach allows network operators to optimize throughput while balancing energy consumption—centralizing more scheduling improves performance but increases energy costs. This way, the patent addresses and solves the problem of Flexible functional split of network control functionalities between the central and distributed units defined by major international body for standardization of mobile networks – 3GPP – in the standardization document 3GPP TR 38.801 v 14.0.0, March 2017, pages 59 a 60, Note that basically all companies related to mobile networks (including 5G and beyond 5G) are involved in activities of 3GPP, for example, Apple, Nokia, Samsung, Ericsson, Meta, LG, Huawei, Microsoft, Google, Xiaomi, STMicroelectronics, Qualcomm, Intel, all mobile operators, just to name a few. This highlights the importance of the problem addressed by the patent for the practice. This patent is followed by two US patents elaborating the idea from the implementation point of view: US10849139B2 - Hierarchical resource scheduling method of wireless communication system, granted 11/2020.

Illumination-guided example-based stylization of 3D renderings

(*Patent, CN107492143 (2021), GB2551873 (2019) and US10176624B2 (2019)*)
https://patents.google.com/patent/CN107492143B
https://patents.google.com/patent/GB2551873B
https://patents.google.com/patent/US10176624B2
This U.S. patent presents a new approach to the example-based stylization of 3D objects. Unlike previous techniques, which used only information about colors or surface normals for the synthesis, the method presented in this patent builds upon the knowledge of light propagation in the scene. Thanks to this new source of information, the technique can distinguish between individual context-dependent illumination effects, for which artists usually use different stylization techniques. Historically, the proposed method is the first, which can create synthetic images that could pass an NPR version of the Turing test. An artist can hardly distinguish original artwork from a synthetically generated image. Adobe, Inc. announced its possible future integration into its products at the prestigious Adobe MAX conference. CTU in Prague jointly owns this patent together with Adobe, Inc.

We are negotiating possible licensing of this patent with the following companies/studios: Walt Disney Animation Studios, Walt Disney Imagineering, ABC (Disney), Liberty Films, Animatrik, Fractal Systems, Augmently, Nexus Studios, NetDragon, Goldtooth, Rune Spaans, Anifilm, Tornante, Int./Night, MAUR film.

Off-line LiDAR and Camera System Calibration Software

(2022, Software, licences sold 1,651.676 CZK, MAN Truck & Bus SE)
https://cordis.europa.eu/project/id/688652
The calibration of exteroceptive automotive sensors is the determination of internal and external sensor parameters. It is vital for vehicle control and sensor data fusion in assisted and autonomous driving. It is also a very frequent task as it is strictly required after many service operations. The LiCaCal software calibrates the external parameters of individual sensors in an omnidirectional system of cameras and LiDARs distributed over the body of a vehicle relative to each other and in the vehicle's coordinate system. In addition, it computes internal camera calibrations (including nonlinear radial distortion parameters) Its angular accuracy is better than the angular resolution of the sensors, which exceeds the performance of available solutions. It also calibrates shifts in the time-base of the individual sensor subsystems. The approach is state-of-the-art in the models used (Lie group representations, efficient hierarchical bundle adjustment), uses some novel global robust algorithms for matching geometric primitives, and does not require sophisticated, high-precision, specially manufactured calibration targets used by the manufacturers of sensor subsystems. The first version of LiCaCal has been developed in the H2020 project UP Drive. Since the end of the project, several upgrades have been released and licensed to research divisions of major manufacturers in the transportation domain, specifically in the Volkswagen Group. So far, the total income for the license and subsequent maintenance and upgrade contracts has exceeded EUR 160,000 (including contracts that have not been closed). The ease of use and the calibration accuracy allows for faster development of robust sensor systems for automated or autonomous driving. LiCaCal helped our partners with the successful completion of several autonomous transportation projects (disclosing the projects would indirectly disclose our partners, which is not permitted by the agreements). The licensor and contractor of the follow-up contracts is FEL CVUT in all cases.

Orthogonal fluxgate sensor

(2020, Patent, EP3460499)
https://register.epo.org/application?number=EP18181052&tab=main
The presented patent offers a new solution of an orthogonal fluxgate sensor that significantly reduces the noise compared to the state-of-the-art solution. This technology produced sensors with noise below 1 pT/ sqrtHz at 1 Hz, which is the best result ever reported for room-temperature magnetic sensors. The unique solution of the sensor is based on the special performance of a ferromagnetic coil partially embedded in a filler material with specific thermal conductivity and hardness. The effect of the layer of the filler material is temperature homogenization of the core and minimization of mechanical stresses acting on the core. Such a solution reduces the noise by a factor of 4 compared to the best competitor. The European patent office examined this solution's novelty, and the result is protected by European patent EP3460499. New sensors will find applications in medical magnetocardiography, geophysical prospection, security, and non-destructive testing. CTU has already signed a development and non-exclusive license agreement with a major international company. The contract is confidential, but it was partly anonymized, and it is disclosed to the evaluator under strict confidentiality. The license fee consists of a one-time fee and royalties per every built sensor.

A Method of Determining Systolic and Diastolic Blood Pressure and the Unit for This Method

(2019, Patent, EP3010400)
https://worldwide.espacenet.com/publicationDetails/biblio?CC=EP&NR=3010400B1&KC=B1&FT=D&ND=4&date=20190731&DB=EPODOC&locale=en_EP
The patent provides a unique method for calculating systolic and diastolic blood pressure from a plethysmographic curve. The patented method eliminates the disadvantages of the existing de facto only applicable method for determining SP/DP using a pressure gauge with a throttling pressure cuff attached to the arm. However, this current method is energy-intensive, manipulative and, above all, annoying. The invention lies in the continuously or once obtained plethysmographic curve is mathematically processed by the invented method (digitization, filtration and selection of valid segments of the curve for determination of both blood pressure values). The invention and its implementation, the HeRo (Health Robot) technology, represents a key component for remote, automatic and inconspicuous monitoring of human health by non-contact sensing and calculation of systolic and diastolic blood pressure. This unit is the basis for long-term health control of the individual and is expected to be part not only of a "smart watch", but of an overall change in healthcare, where robots and expert systems take over the basic tasks of a doctor. This means that a device that independently manages important functions and communicates with the home center, medical center, and first aid center. The most significant advantage of the developed HeRo robot is its contactless data acquisition and complete evaluation of systolic and diastolic blood pressure continuously at set intervals during the day and corresponding summary of other necessary measurements for health monitoring (heart rate, temperature, blood oxygen content, etc. ..). Additional functions can be easily added. HeRo technology has been successfully tested in practice. It is patented in the Czech Republic, the EU and also in the USA. European patent EP3010400 is validated practically throughout Europe. Currently, 3 negotiations are underway on the license agreement (iSmarties s.r.o., Witty Trade s.r.o, S-Case.io) and an action for patent infringement is being prepared.

Simulator of skills of dispatchers of Emergency Medical Dispatch

(*2021, Software, https://operatorzos.fel.cvut.cz/, Sold licences 511k CZK)*
The "Operator" software simulator (https://operatorzos.fel.cvut.cz), developed through extensive research and creative activity, is the first Czech simulator for training Emergency Medical Services (EMS) dispatch center operators. It helps operators make timely decisions on ambulance dispatches, considering patients' health conditions. The simulator provides a stress-free, repeatable, and measurable training environment, covering routine operations to mass disaster scenarios. The software's social significance lies in enhancing the training and experience of key personnel, crucial for life-saving interventions and patient care improvement. Available in English, the system is ready for additional language versions, making it applicable beyond the Czech and Slovak Republics. In 2023, the simulator received the Rector's Award for its impactful application in scientific and creative work. It has been promoted through various events, including the "Rallye Rejvíz" (https://rallye-rejviz.cz/en/) competition and prime-time coverage on Czech Television. Concrete applications include its use by EMS dispatch centers in the South Moravian, Karlovy Vary, and Pilsen Regions (cooperation with the company Life Support s.r.o.), and Prague Emergency Medical Services (2-year contract including support and customized scenarios). It has also been implemented at Vysoká škola zdravotnická for preparing future dispatchers. The software has generated revenue through licenses and training programs. Additionally, there are ongoing negotiations with the Czech Police Presidium to modify the simulator for police training needs. These applications demonstrate the simulator's broad impact on improving emergency response and training across various sectors.

Gender-related aspects of listening quality and effort in speech communication systems

(2023, Result Reflected in Legislation and Standards)
https://www.etsi.org/deliver/etsi_tr/103900_103999/103950/01.01.01_60/tr_103950v010101p.pdf
The present document addresses the effects of the speaker's gender-related aspects on transmission quality. It provides recommendations on test procedures and measures for future technologies for human speech communication systems to balance transmission quality among genders. A natural requirement is that male and female voices are transferred with similar quality; in other words, the transmission technology, including coding algorithms, frequency filters, or sampling rates, should not privilege one gender over the other to maintain similar working conditions and opportunities for all. Potential imbalance can affect professionals who deploy distant voice communication in their daily duties - e.g. female airport approach control dispatchers or other professionals (policewomen) who are principally disadvantaged by technological aspects of their job - worse voice transmission quality means higher listening effort is needed. It may lead to consequent (subconscious) discomfort of their communication partners. Gender transmission quality misbalance is not surprising for narrow-band transmissions due to the generally higher pitch region of female voices; however, it is often observed also in contemporary digital wideband or even full-band communications. As a direct consequence of ETSI document TR 103 950 approval and publication, the author was awarded a NATO Chief Scientist Grant on "Gender-related Aspects of Low Bit-rate Secure Voice Communications", see:

https://www.sto.nato.int/SitePages/newsitem.aspx?ID=3959

Nine projects were selected to receive support from a total of 231 applications. The project includes a set of subjective listening tests performed on simulated military secured voice channels to evaluate potential gender imbalance of their transmission quality by application of the ETSI TR 103 950. If the project results are significant, the process of the ETSI TR adoption into NATO standard (STANAG) will be initiated.

Concept of public lighting in the capital city Prague - Technical state and development in the field of lighting technology

(2022, Result Reflected in the Agreed Strategy and Policy Documents)
This study presents key research findings on public lighting, summarizing information and providing a foundation for further development in the capital city of Prague. It serves as a basis for defining the characteristics and parameters of individual elements within the public lighting system. The first section examines public lighting as an essential public infrastructure, outlining its operational characteristics and key components. Research results have been applied to contributing to the systematic management of Prague's public lighting. In alignment with the city's strategic approach, these efforts are reflected in the Concept of Prague Public Lighting, a comprehensive policy framework defining the city's nighttime visual identity. This concept integrates both public and architectural lighting while addressing critical factors such as safety, environmental impact, and the aesthetic quality of public spaces. Research findings have informed the renewal and modernization plans for public lighting, ensuring consistency with the city's financial planning and long-term sustainability goals. Moreover, these results establish technical and operational standards for public lighting activities and products within the system.

The MRS UAV System

(2023, Software, https://github.com/ctu-mrs/mrs_uav_system)
The MRS (Multi-Robot System) UAV system, developed by the CTU MRS Group, was open-sourced in May 2020 after winning the MBZIRC 2020 (https://mrs.fel.cvut.cz/mbzirc2020) robotics competition in Abu Dhabi. The competition included 20 pre-selected teams from the 200 best robotic teams worldwide, and the CTU MRS Group received over 7 million CZK in prize money and

support. The MRS group published the robot software used in the competition as open source (https://github.com/ctu-mrs/mrs_uav_system) to allow other robotics departments to compare their solutions and contribute to the system's development. The software package includes the core MRS UAV System for controlling UAVs, navigation, localization, object detection, and simulations. The system incorporates real-time dynamic simulation of UAV dynamics for large-scale swarms and high-fidelity simulation using a Gazebo/ROS simulator. Moreover, an abstract plugin API connects the system to any available robotic simulator or underlying hardware. The system enables safe real-world deployment of user-based software onboard autonomous drones. Since its release, the software has been used worldwide for research in autonomous drones. The system is continuously maintained and improved, with over 200 issues addressed and 1,000 downloads globally. It is also used in summer schools, educating over 600 students in drone technology. In 2023, a commercial updated version was released, selling 55 licenses to companies Foxfour (Tallinn, Estonia) and TII (Abu Dhabi, UAE). Additionally, the system was used in contracts with German company EO.N, Research lab in Munich, for multi-robot inspection of high-voltage power lines, earning 6.2 million CZK for deploying this SW. The project has had a positive societal impact, contributing to education, research, and industry applications.

A System of Sensory-equipped Helicopter with a Mechanism for Safe Flight in Historical-documentation Applications in Building Interiors

(2021, Functional Sample)

This worldwide unique fully autonomous UAV system is designed for the safe documentation of historical monuments (http://mrs.felk.cvut.cz/projects/dronument). It integrates state-of-the-art methods of autonomous stabilization, localization, and navigation of cooperative UAVs inside large historical buildings. The system enables safe scanning without the need for expensive scaffolding, flying beyond the visual line of sight, and operating in low lighting conditions using smart illumination by cooperating UAVs. It has been successfully deployed in various historical sites, including UNESCO buildings and large cathedrals worldwide, such as Saint Nicholas Church in Prague and Archbishop's Chateau in Kroměříž. These campaigns provided valuable data for restoration planning and public documentation through pictures, 3D models, and videos. Approved by the National Heritage Institute (NPÚ) for indoor use, the system is accompanied by a Methodology of using unmanned helicopter technology for documentation of interiors and exteriors of historical buildings. It is the first methodology for using UAVs indoors in historical buildings and so prescribes the system to be a standard in this application. This work was supported by project NAKI II DG18P02OVV069, Safe scanning of historical objects by unmanned helicopters - assistive technologies, methodics and exploitation in heritage protection.

Table 3.4.1 - Overview of research results in the period under evaluation

Type of result[31]	Year of application	Name
Patent	2020	Hierarchical resource scheduling method of wireless communication system
Patent	2019, 2021	Illumination-guided example-based stylization of 3D renderings
Software	2022	Off-line LiDAR and Camera System Calibration Software
Patent	2020	Orthogonal fluxgate sensor
Patent	2019	A Method of Determining Systolic and Diastolic Blood Pressure and the Unit for This Method

[31] Specify the specific type of result. Add rows as needed.

Software	2021	Simulator of skills of dispatchers of Emergency Medical Dispatch
Result Reflected in Legislation and Standards	2023	Gender-related aspects of listening quality and effort in speech communication systems
Result Reflected in the Agreed Strategy and Policy Documents	2022	Concept of public lighting in the capital city Prague - Technical state and development in the field of lighting technology
Software	2023	The MRS UAV System
Functional Sample	2021	A System of Sensory-equipped Helicopter with a Mechanism for Safe Flight in Historical-documentation Applications in Building Interiors

Note 1: Please list and describe the results already applied in practice or heading towards application in practice with existing or prospective impact on the society (e.g. domestic or foreign patents, sold licenses, spin-offs, prototypes, varieties and breeds, methodologies, significant analyses, surveys, expert outputs for policymaking or other forms of non-publication outputs, etc.). Indirect results of research, development and creative activities with documented societal impact, e.g. expert activities, services to the public/government/scientific community, may also be reported.

TRANSFER OF RESULTS INTO PRACTICE

3.5 Transfer of results into practice

The evaluated unit shall briefly describe its system for transferring results into practice. It shall also indicate up to five of the most typical users of its results, whether in the university environment or in the non-university application/corporate sphere, detailing how it collaborates with them and how it seeks out new users (using a maximum of five specific examples).

It will also indicate whether and how it commercialises R&D&I results (e.g. selling licences, setting up start-up or spin-off companies, etc.)[32], providing a brief description of the commercialisation methods used. The effectiveness of the transfer of results and the commercialisation of R&D&I results will be described using a selection of results (max. five) listed in the annex table (Table 3.4.1).[33] Additionally, the evaluated unit shall briefly comment on the funds received during the period of 2019–2023 from non-public, non-grant sources (e.g. licences sold, spin-off revenues, donations, etc.). A full summary shall be provided in the annex table (Table 3.5.1).

Maximum 500 words plus 200 words for each provided example of finding a new user of results and commercialization.

Self-assessment: Transferring results into practice is organized by **Technology Transfer Team (TTT)** in close connection with the Department of Science and Research. TTT is methodically managed by the Vice-Dean for Cooperation with Industry and Commercialization.
TTT supports employees in the preparation of the notification of results with application potential, patent applications, utility models, trademarks, protection of trade secrets. All registered in the database EZOP.
TTT provides IP search by expert using professional database prior to invention disclosure by faculty members, registration of IP, monitoring of license agreement terms, keeping records of all forms of commercialization of business transactions, research capacities and know-how available at the faculty to be transferred into practice, continuous search for opportunities for using the scientific potential of the faculty by active offers of cooperation and their presentation on the faculty website. Researchers are supported by providing standard draft cooperation agreements with external entities, provision of legal support in establishing contractual relationships, coordination of negotiations with those interested in cooperation, preparation of the project plan, setting the conditions of cooperation in cooperation with departments, financial support of Proof-of-Concept projects resulting from internal tendering, market evaluation with the aim of developing a

[32] In the case of military HEIs, their specific position is taken into account when evaluating the commercialisation/evaluation of R&D&I results.
[33] If the commercialisation of R&D&I results is carried out in this way.

commercialization plan, project management, preparation of documents for invoicing. TTT is also acting as a contact point for contacts with industry by accepting requests for cooperation, evaluating requests and making offers.

In cooperation with the Transfer Team of the Rectorate, the TTT provides support for setting start-up, spin-off, spin-in, spin-out, and joint venture companies. On top of it, the spin-off ČVUT Tech s.r.o., 100 % daughter company of the CTU, has been established to speed-up the transfer of the University IP to industry.

Forms of transfer in brief:

Short-term collaborations: provision of one-off services, analytical work, consultations, educational services, assessments, measurement and use of know-how, implementation of specialized training in the field of our expertise or unique know-how.
Mid-term collaborations: custom research or consultations that are carried out personally by a specialist on a specific customer problem. The subject is usually a more complex problem, the solution of which requires the use of the capacity of our departments.
Long-term collaborations: joint research and development activities - contract research. More comprehensive research with the aim of building strategic alliances.
Example1: Toyota Research Lab – algorithms for autonomous driving. 2019 - 2023: 3,478 kEUR.
Example2: Škoda Auto - Virtual Reality Universal Toolkit. 2019 - 2023: 1,275 kEUR
Miscellaneous: Patent sales, licensing, application of technologies at the proof-of-concept stage.

Table 3.5.1 - Summary of non-public revenues received during the period under evaluation

Type of revenue	Revenue (in thousands CZK/EUR)				
	2019	2020	2021	2022	2023
Revenues from cooperation with industry including licences sold	2785/ 109881	2466/ 97267	3411/ 134541	6908/ 272496	9987/ 393956
Donations	8044/ 317308	8931/ 352302	8744/ 344942	8834/ 348490	11385/ 449108
Revenues from the organisation of conferences	195/ 7692	339/ 13389	340/ 13395	520/ 20513	2131/ 84043
Total	10951/ 431967	11562/ 456113	12418/ 489870	16077/ 634225	23356/ 921310

Note: Enter funds raised for R&D&I from non-public sources besides grants or contract research (e.g. licences sold, spin-off company revenues, donations, etc.) in the calendar year.

POPULARIZATION OF VAVAI

3.6 The most important activities in the field of popularization of R&D&I and communication with the public

The evaluated unit shall briefly describe its main activities related to the popularisation of R&D&I and communication with the public (e.g. popularisation lectures, citizen science initiatives, etc.) during the period of 2019–2023 and provide up to 10 examples that it considers the most significant.

Maximum 500 words plus 200 words for each example given.

Self-assessment: FEE implements an **extensive** and **comprehensive programme of popularisation of science and technology**, involving hundreds of teachers and students. We target a wide range of audiences - not only pupils, students and teachers, but also families with children and adults in the context of lifelong learning. We reach hundreds of thousands of people on social media, and tens of thousands of visitors attend our events each year. FEE is also the most active part of CTU in terms of

media presentation. In the period under review, our media monitoring recorded more than **7,700 media appearances** of our academic staff on television, radio, in print and on the Internet. Ten examples of our PR activities include:

Media presentation of FEE CTU
As of 2021, we have the highest number of media outputs of all faculties and in 2024 we will reach 28% share. Popularisation in the media is possible due to the fact that our researchers are very actively involved.

Knowledge competitions and Olympiads for secondary schools
FEE organises a successful Robo Competition in programming robots from the Lego Mindstorms kit and an Electrotechnical Olympiad. We are also partners of the Energy Olympiad and the Technology Olympiad.

eForce Prague Formula
A team of students from FEE CTU and FS CTU develops autonomous electroformulas, with which they score points on European Formula Student race tracks. eForce is also the most successful student electroformula team in the Czech Republic.

Events for the general public
FEE participates in the Night of Scientists, Comic-Con, ABC Festival, Science Fair and ScienceFest - it presents robots, eForce, soldering courses, etc. It is also involved in the Open House urban architecture festival.

Social networks
Social media videos are a great way to get the younger generation excited about technology and to dispel the preconception that science is only for the chosen few. Every year we publish more than 15 videos in this way.

Programmes for secondary schools
FEE Open Days are held twice a year in person and once online. FEE organizes excursions for students of secondary schools. Within the framework of partnership, it currently cooperates with 14 secondary schools - 10 secondary schools and 4 grammar schools.

Physics Thursdays (in Czech)
A free series of lectures and seminars organised by the Department of Physics of FEE CTU for students, teachers and professionals as well as the wider public. Each week, scientists from different disciplines come to FEE.

Adventure Pedagogy - Summer Camps
The CTU Children's University is for primary school students in grades 1-8; after workshops and competitions, they will have a graduation ceremony at Bethlehem Chapel. FEL Camp is for high school students who learn technology through a full-camp play.

Popularizing science and technology for women and girls
FEE is committed to engaging women and girls in science. With FJFI, it organizes the Become a Woman Scientist for a Day event, full of lectures and exercises. In addition, FEE students from wITches organise programming workshops for children.

Afternoon clubs
The ECT22 club teaches pupils the basics of electrical and electronics engineering through experiments before they start university. The Radio club teaches interested students from both university and high school how to make a working radio receiver and transmitter.

IMPLEMENTATION OF RECOMMENDATIONS

3.7 Implementation of the recommendations in Module 3

The evaluated unit will briefly describe how it has implemented the recommendations for Module 3 from the previous evaluation period, if applicable.

Maximum 1000 words.

Improvement of the weak departments.

To support the R&D activities of departments with development potential we use"CTU FEE Grant: 'PhD Study with a Distinguished External Co-Supervisor'" which is aimed at departments placed in the latest quartil in department order sorted according to the R&D performance measured by our Criteria for the Evaluation of Scientific Research Activities at FEE. Another measure adopted to support these departments is Vice-Dean's Award for PhD-authored Papers in Top Journals, which financially supports students who publish in the relevant journals of Q1, Q2 according to their IF. The CTU FEE Grant has been awarded 9 times since 2021.

Intellectual property rights (IPRs).

We are using various European Patent Attorney offices according to the field of invention. For the cooperation with partners outside Europe, the non-European Patent Attorney offices of our partners are utilized. Czech Patent Attorneys are preferably committed to taking care of the locally protected IP by the Industrial Property Office of the Czech Republic.

We are striving for high-quality IP with high commercialization potential. Our strategy for high royalties is based on supporting the patents with a high content of attractive industrial secrets.

The relative share of US, Japanese, and EU patents in the total number of patents in 2019-23, compared to 2014-18, has increased to 27/62 from 12/53.

The duration of PhDs. 4 years is a must.

In order to shorten the study period until the submission of the dissertation to the standard period (4 years), we are gradually taking a number of measures. At the university level, we have legislatively (restrictively) reduced the maximum time to submit a dissertation from 7 to 6 years in the Study and Examination Code in 2021. At the faculty level, we take more motivational measures, e.g. we award the Dean's Prize for an outstanding dissertation to those theses that are submitted in less than 5 years from the start of the candidate's studies, we directly financially motivate supervisors of those students who submit their theses within 4 or 5 years, at the departmental level, within the rules of distribution of financial resources, we bonus the submission of theses within the standard time (double weight compared to those submitted later), and we try to come up with other motivational measures. In 2014-2018, the number of dissertations submitted within five years of enrolment was 23%, 24%, 23%, 25%, and 20%, respectively. In 2019-2023, the figures were 23%, 23%, 30%, 36%, and 48%.

Applied research, contract projects

The Faculty intentionally keeps the administration overhead at a minimum by providing a one-page template to investigators. Smaller projects are often used to test the initial cooperation, with the possibility of following larger projects.

PhD students are primarily supported by basic and applied research grants, secondarily by industrial R&D contracts. However, some of the contractual research agreements directly support PhD students in their research.

The continuous growth of income from non-public sources can be documented by the total income of CZK 89M in 2022, followed by CZK 134M in 2023.

Applied research results with an existing or prospective economic impact on society
Our faculty has repeatedly contributed significantly to the national list of selected results with social impact within the governmental Methodology Evaluation of Research Organizations in both categories - Contribution to the current state of science and Social relevance. The selected results are explicitly peer-evaluated and are reflected in the faculty scheme for evaluating scientific results.

Significant applied research results with other than economic impact one on society
The number of projects between units within CTU and in collaboration with other universities has been growing quite rapidly in recent years. There were, for example, CAP (2017-2023) where FEE cooperated with another CTU part, University Center for Energy Efficient Buildings, EcoStor (which officially started in January 2024, but was prepared and approved in the period under review) where FEE participates on the project lead by University of Chemistry and Technology (VŠCHT) in work packages: Batteries and supercapacitors, Power-2-X, Solar-2-X, Molecular design in energy storage and conversion, Engineering of storage and conversion systems.
FEE is also active in the program EuroTeQ Collider, a new type of student project course organized within the EuroTeQ alliance, where multidisciplinary students from partnering schools solve real-world challenges provided by a company or research institute.

System and support of technology transfer and intellectual property protection
We have established a new Technology Transfer Team (TTT) at the faculty, which is methodically managed by the Vice Dean for Cooperation with Industry and Commercialization who has been working for a long time (2007-2025) in companies like ABB Switzerland Ltd., Semiconductors. The TTT provides support in obtaining industrial property protection for results with application potential, contract preparation, market research, and support for the establishment of spin-off and start-up companies. He works closely with the Rectorate's Technology Transfer Department.
Faculty TTT, in cooperation with the CVUT Technology Transfer and Fundraising Office (TTFO), supports the set-up of **spin-off companies** according to a defined strategy: simple & transparent licensing of IP generated and owned by CVUT under standard conditions to the newly established CVUT spin-off. Starting from the proposal for commercialization, the new company staff is guided by the TTT and TTFO teams through the initial legal procedure. Hereby, the set-up time of a spin-off is significantly shortened to a few weeks.

Recognition by the international R&D&I community
In order to adopt good practices from abroad more widely, we have adopted a measure aimed at PhD students called "'PhD Study with a Distinguished External Co-Supervisor'", which aims to promote international co-supervision of PhD students and to establish an international relationship. We have also launched a faculty program to financially support doctoral students' internships at foreign institutions. Similar support is provided to academic staff by the university, with the faculty participating financially.

Detailed responses, broken down according to the original numbering used in the 2020 report, are provided in Appendix A.

A LIST OF SUPPORTING DOCUMENTS/LINKS FOR MODULE 3

Document name	No. criteria	Location (link in HTML)
Annual report 2023	3.1	annual report 2023 https://fel.cvut.cz/dokumenty/ke-stazeni/vyrocni-zpravy/vyrocni-zprava2023.pdf

DARPA – News - Rolling, Walking, Flying, and Floating, SubT Challenge Teams Traverse The Tunnel Circuit	3.2.1	https://www.darpa.mil/news-events/2019-08-22
FEE CTU – AI Center – Award - Bronz from the DARPA Subterranean Challenge Urban Circuit	3.2.1	https://www.aic.fel.cvut.cz/news/bronz-from-the-darpa-subterranean-challenge-urban-circuit
DARPA – News - SubTerranean Challenge, Final Event Virtual Competition	3.2.1	https://www.darpa.mil/news-events/2021-09-24a
Multi-Robot Systems Group – FEE CTU - MBZIRC 2020 – about the Competition	3.2.1	https://mrs.fel.cvut.cz/competitions/mbzirc2020-compe
Werner von Siemens Prize – Winner 2022	3.2.1	https://www.cenasiemens.cz/minule-rocniky/vitezove-2022/#prumysl-40
Werner von Siemens Prize – Winner 2023	3.2.1	https://cyber.felk.cvut.cz/news/werner-von-siemense-awards-2023/
IEEE AP-S Awards 2023	3.2.1	https://ieeeaps.org/awards/winners-of-2023-ap-s-awards-announced
The British Machine Vision Association and Society for Pattern Recognition	3.2.1	https://bmvc2022.org/programme/paper-awards/
Joseph Fourier Prize	3.2.1	http://sami.fel.cvut.cz/CenaJF.pdf
Neuron Prize 2023	3.2.1	https://www.nadaceneuron.cz/person/computer-science
SIGEVO Impact Award	3.2.1	https://dl.acm.org/doi/10.1145/1830761.1830790
The Global Undergraduate Awards -Mathematics & Physics	3.2.1	https://cyber.felk.cvut.cz/cs/news/dominika-buresovas-achievement-in-the-global-undegraduate-awards/
International Journal of Computer Vision – Springer nature link - Home	3.2.2	https://www.springer.com/journal/11263
International Journal of Computer Vision – Current Issue	3.2.2	http://www.ijcv.org/

IEEE Transactions on Information Forensics and Security - Home	3.2.2	http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=10206
IEEE Transactions on Automation Science and Engineering – T-ase – Editorial Board	3.2.2	https://www.ieee-ras.org/publications/t-ase/editorial-board
Control Engineering Practice – about the Journal	3.2.2	https://www.sciencedirect.com/journal/control-engineering-practice
Measurement - about the Journal	3.2.2	https://www.journals.elsevier.com/measurement
Computers & Security - about the Journal	3.2.2	https://www.journals.elsevier.com/computers-and-security
IEEE Open Journal of Intelligent Transportation Systems - Home	3.2.2	https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=8784355
Evolutionary Computation – about the Journal - Current Issue	3.2.2	http://www.mitpressjournals.org/loi/evco
Machine Learning - Springer Nature Link - Home	3.2.2	https://link.springer.com/journal/10994
VISIGRAPP 2019 – Keynote Lectures	3.2.3	14th International Conference on Computer Graphics Theory and Applications VISIGRAPP2019
EUCAP 2021 – Invited and Keynote Speakers	3.2.3	https://www.eucap2021.org/conference/invited-and-keynote-speakers_new
IEEE Events Hosting Service - Home	3.2.3	https://ieee-wf-5g.org/optical-wireless-communication-owc/
MRC - LMB Symposium - Welcome	3.2.3	https://www3.mrc-lmb.cam.ac.uk/sites/gsasymposium/
IEEE LARS 2023 – Keynote Speakers	3.2.3	20th IEEE Latin American Robotics Symposium - LARS 2023
	3.2.3	https://comunidad.udistrital.edu.co/ciect14/programacion/
STARFOS – RCI - Finance	3.3	**Research Center for Informatics (RCI)** https://starfos.tacr.cz/en/projekty/EF16_019%2F0000765#project-finance
Jakub Mareček – Google Scholar	3.3	Jakub Marecek https://scholar.google.com/citations?hl=en&user=Ew8TNsMAAAAJ
STARFOS – Projects – Centre of Advanced Photovoltaics – Basic information	3.3	**Centre of Advanced Photovoltaic (CEP)** https://starfos.tacr.cz/en/projekty/EF15_003%2F0000464#project-main

FEE CTU – Centre of Advanced Photovoltaics - Home	3.3	faculty www http://cap.fel.cvut.cz/en/
STARFOS – Projects - Future Electronics for Industry 4.0 and Medical 4.0 – Basic information	3.3	**Future Electronics for Industry 4.0 and Medical 4.0 (FEIM)** https://starfos.tacr.cz/en/projekty/TN02000067#project-main
Humancompatible.org - Home	3.3	**Human-Compatible Artificial Intelligence with Guarantees** https://humancompatible.org/
STARFOS – Projects - Research Infrastructure for Doctoral Programmes at CTU FEE – Basic information	3.3	**Research Infrastructure for Doctoral Programmes at CTU FEE** https://starfos.tacr.cz/en/projekty/EF16_017%2F0002280
FEE CTU – Advanced Materials Group – Nano - Home	3.3	**Novel nanostructures for engineering applications** https://nano.cvut.cz/nanostructures-for-engineering-applications
TRACE Lab - Home	3.3	https://www.trace-lab.com/
Center for Robotics and Autonomous Systems – DARPA Sub-T	3.3	**DARPA Subterranean Challenge** https://robotics.fel.cvut.cz/cras/darpa-subt/
Multi-Robot Systems Group – FEE CTU - MBZIRC 2020 – about the Competition	3.3	MBZIRC Challenge https://mrs.fel.cvut.cz/mbzirc2020
Green Code – About VRUT	3.3	**VRUT system development (Virtual Reality Universal Toolkit)** https://www.greencode.cz/en-blog/about-vrut
Department of Computer Science, FEE CTU – AAICL - Home	3.3	**Avast AI and Cybersecurity Laboratory at FEE CTU (AAICL)** https://cs.fel.cvut.cz/en/page/aaicl-avast-ai-and-cybersecurity-laboratory
Patent US10849139 - Hierarchical resource scheduling method of wireless communication system	3.4	https://patents.google.com/patent/US10849139B2/en
Patent US10624105 - Hierarchical resource scheduling method of wireless communication system	3.4	https://patents.google.com/patent/US10624105B2/en
Patent CN107492143 (2021) - Illumination-guided example-based stylization of 3D renderings	3.4	https://patents.google.com/patent/CN107492143B

Patent GB2551873 (2019) - Illumination-guided example-based stylization of 3D renderings	3.4	https://patents.google.com/patent/GB2551873B
Patent US10176624B2 (2019) - Illumination-guided example-based stylization of 3D renderings	3.4	https://patents.google.com/patent/US10176624B2
CORDIS - EU research results – Automated Urban Parking and Driving – Fact Sheet	3.4	https://cordis.europa.eu/project/id/688652
European Patent Register - Orthogonal fluxgate sensor	3.4	https://register.epo.org/application?number=EP18181052&tab=main
Espacenet – Data of Patent - A Method of Determining Systolic and Diastolic Blood Pressure and the Unit for This Method	3.4	https://worldwide.espacenet.com/publicationDetails/biblio?CC=EP&NR=3010400B1&KC=B1&FT=D&ND=4&date=20190731&DB=EPODOC&locale=en_EP
Operator – FEE CTU - Home	3.4	https://operatorzos.fel.cvut.cz/
ETSI – Technical Report - Gender-related aspects of listening quality and effort in speech communication systems	3.4	https://www.etsi.org/deliver/etsi_tr/103900_103999/103950/01.01.01_60/tr_103950v010101p.pdf
Science & Technology Organization - NATO STO announces winners of 2025 NATO Chief Scientist Grants	3.4	https://www.sto.nato.int/SitePages/newsitem.aspx?ID=3959
ctu-mrs/mrs_uav_system - Code	3.4	https://github.com/ctu-mrs/mrs_uav_system
Multi-Robot Systems Group – FEE CTU - MBZIRC 2020 – about the Competition	3.4	https://mrs.fel.cvut.cz/mbzirc2020
Multi-Robot Systems Group – FEE CTU - Dronument	3.4	http://mrs.felk.cvut.cz/projects/dronument
Robo Competition – FEE CTU - Home	3.6	Robo Competition https://robosoutez.fel.cvut.cz/?gad_source=1&gclid=Cj0KCQjw-e6-BhDmARIsAOxxlxXH0RmJStnygW8ROHvIYjm3zPK43u-0DmFSNejukr6p79JjqK9MadcaAi15EALw_wcB
Electrotechnical Olympiad – FEE CTU - Home	3.6	Electrotechnical Olympiad https://go2.fel.cvut.cz/
Energy Literacy - Olympiad	3.6	Energy Olympiad

		https://www.energeticka-gramotnost.cz/olympi%C3%A1da
Technology Literacy - Olympiad	3.6	Technology Olympiad https://www.technologicka-gramotnost.cz/olympiada/
EFORCE Prague Formula – FEE CTU - Home	3.6	eForce Prague Formula https://eforce.cvut.cz/
FEE CTU - What´s on - News	3.6	Night of Scientists https://fel.cvut.cz/cs/aktualne/novinky/36022-noc-vedcu-na-fel-ukaze-jak-planovat-trasy-s-roboty-i-efektni-mlznou-komoru
FEE CTU – What´s on - News	3.6	Comic-Con https://fel.cvut.cz/en/what-s-on/news/33750-fel-entertained-people-with-robots-van-de-graaff-soldering-and-vr-applications-at-comic-con-prague
FEE CTU – What´s on - News	3.6	ABC Festival https://fel.cvut.cz/cs/aktualne/novinky/33799-fel-cvut-na-festivalu-abc-ukaze-roboty-i-technologicky-cirkus-vyzkousite-si-i-simulator-formule
FEE CTU – What´s on - News	3.6	Science Fair https://fel.cvut.cz/en/what-s-on/news/35344-fee-ctu-will-show-a-balancing-robot-at-sciencefest-you-can-also-try-a-formula-simulator-or-soldering
FEE CTU – What´s on - News	3.6	ScienceFest https://fel.cvut.cz/en/what-s-on/news/33946-fee-will-show-a-robotic-zoo-and-robot-rescuers-at-the-science-fair-you-will-also-get-an-unusual-souvenir
FEE CTU – What´s on - News	3.6	Open House https://fel.cvut.cz/en/what-s-on/news/33887-open-house-prague-fee-ctu-will-make-santini-chapel-accessible-through-virtual-and-augmented-reality
Instagram – Profile FEE CTU	3.6	publish https://www.instagram.com/cvutfelpraha/?hl=cs
FEE CTU – What´s on - News	3.6	Open Days https://fel.cvut.cz/en/what-s-on/news/33423-open-day-photo-gallery
FEE CTU - Cooperation	3.6	framework of partnership https://fel.cvut.cz/en/cooperation/for-high-school-associated-with-our-faculty

FEE CTU – Department of Physics – Teaching and Popularization	3.6	Physics Thursdays https://phys.fel.cvut.cz/en/about-the-department/#
FEE CTU – What´s on - News	3.6	CTU Children's University https://fel.cvut.cz/en/what-s-on/news/35614-science-and-technology-are-cool-fresh-graduates-of-the-ctu-children-s-university-know
FEL Camp - Home	3.6	FEL Camp https://camp.fel.cvut.cz/
FEE CTU – What´s on - News	3.6	Become a Woman Scientist https://fel.cvut.cz/en/what-s-on/news/33366-dozens-of-female-students-at-the-become-a-scientist-for-a-day-event-got-a-glimpse-into-physics-electrical-engineering-mathematics-and-it-research
wITches – FEE CTU - Home	3.6	wITches https://witches.fel.cvut.cz/
Embedded server – FEE CTU – Courses – ETC22	3.6	ECT22 https://embedded.fel.cvut.cz/kurzy/etc22
RADIOCLUB – FEE CTU - News	3.6	Radio club https://radioklub.fel.cvut.cz/en/category/news/
FEE CTU – What´s on - News	3.7	contributed https://fel.cvut.cz/en/what-s-on/news/36949-fee-ctu-holds-the-leading-position-in-the-evaluation-of-research-at-electrical-engineering-faculties-in-the-czech-republic
Ministry of Education, Youth and Sports – Research and Development – Documentation for Evaluation	3.7	Methodology Evaluation of Research Organizations https://msmt.gov.cz/research-and-development-1/documentation-for-evaluation-of-research-organisations-in?lang=2
FEE CTU – Intranet - Research	3.7	Criteria for the Evaluation of Scientific Research Activities at FEE, https://intranet.fel.cvut.cz/en/research/vvs/kriteriaVVC.html
CAP - FEE CTU - Home	3.7	CAP http://cap.fel.cvut.cz/en/

University of Chemistry and Technology – Research - EcoStor	3.7	EcoStor https://www.vscht.cz/veda-a-vyzkum/vyzkumny-profil-vscht-praha/resene-projekty/esf/op-jak-2021-2027/ecostor-cz
EUROTEQ - CTU– Students – EuroTeq Collider	3.7	EuroTeQ Collider https://euroteq.cvut.cz/en/students/euroteq-collider/
FEE CTU – Intranet – Students – PhD Study with a Distinguished External Co-Supervisor	3.7	CTU FEE Grant: 'PhD Study with a Distinguished External Co-Supervisor https://intranet.fel.cvut.cz/en/education/phd/ctu-fee-grant.html
EUROTEQ - CTU – About us	3.7	EuroTeQ https://euroteq.cvut.cz/en/about-us/
FEE CTU – Intranet – Students – Vice-Dean´s Award for PhD-authored Papers in Top Journals	3.7	Vice-Dean's Award for PhD-authored Papers in Top Journals https://intranet.fel.cvut.cz/cz/education/phd/ViceDean%20Award%20Top%20Journal%20_v7
CTU FEE Grant	3.7	https://intranet.fel.cvut.cz/en/education/phd/ctu-fee-grant.html
Vice-Dean's Award	3.7	https://intranet.fel.cvut.cz/cz/education/phd/ViceDean%20Award%20Top%20Journal%20_v7
1. – FEE CTU – What´s on – News – First Award	3.7	https://fel.cvut.cz/cs/aktualne/novinky/35598-prvni-oceneni-vice-dean-s-award-for-phd-authored-papers-in-top-journals-ziskal-ing-filip-baum
2. – FEE CTU – What´s on – Events – Presentation	3.7	https://fel.cvut.cz/en/what-s-on/events/35953-presentation-by-ing-filip-baum

Appendix A

Detailed responses for section 3.7, broken down according to the original numbering used in 2020 report.

Self-assessment: Recommendations of MEP 2020 to individual sections and in general and our response to them. The verbatim text of the recommendation is in *italics.*

3.2 Applied research projects

Recommendation: *It might be discussed in FEE whether the overhead for establishing many very small projects still ensures a balance between effort and benefit.*

Response: Small projects are also very beneficial for us. Faculty intentionally keeps the administration overhead at minimum, by providing a one-page template to investigators. A small project is often used to test the initial cooperation with a company, with possible following of larger projects.

3.3 Contract research

Recommendation: *It might be discussed in FEE if the workload on the research staff for industrial R&D is in a good balance with the scientific work, particularly considering the partly extremely long duration of PhDs.*

Response:

PhD students are primarily supported by basic and applied research grants, secondarily by industrial R&D contracts, which are short-term and cannot be aligned with the topic of the PhD. Most of the contract research work is done by researchers, R&D personnel, assistant professors and postdocs. For the academics, participation in industrial R&D is always a matter of their personal preferences, the income and the work are treated as "on top of the standard contract". It is the role of the head of the department to reduce involvement of an academic, if it interferes with his other duties.

3.4 **Revenues from non-public sources (besides grants or contract research) from research work**

Recommendation: *Over the years, the budget from non-public sources could be maintained on high levels better.*

Response: The continuous growth of income from non-public sources can be documented by the total income of CZK 89M in 2022 followed by CZK 134M in 2023. The total income from license agreements was CZK 102k in 2022 followed by CZK 342k in 2023.

3.5 **Applied research results with an existing or prospective economic impact on society**

Recommendation: *Excellent. Should be continued and extended, where possible, trying to increase the quality of publications in terms of publishing journals, as well as in terms of improving the number of publications in the mentioned weak departments.*

Response: We continued and extended. Our faculty has repeatedly contributed significantly to the national list of selected results with social impact within the governmental Methodology Evaluation of Research Organizations in both categories - Contribution to the current state of science and Social relevance. The selected results are explicitly peer-evaluated and are reflected in the faculty scheme of evaluating scientific results. Scientific results of the faculty are also peer-evaluated at the regular 5-year evaluation/attestation procedure. The quality of publications is monitored, including IF, and bonused in the Criteria for the Evaluation of Scientific Research Activities at FEE, which are the basis for the allocation of budget funds for the conceptual development of our 17 departments.

3.6 **Significant applied research results with other than an economic impact one on society**

Recommendation: *It might be discussed in FEE how to increase this kind of interdisciplinary projects and furthermore, how to create a scientific culture at CVUT for institutionally incubating this kind of cross-faculty project initiatives. Also inside of FEE, there could be more pro-active consideration of cross-department projects with global impact, i.e. on global challenges such as "Smart Grids and Smart Cities" (combining power engineering, control systems, communication engineering, economy, and humanities).*

Response: The number of projects between units within CTU and in collaboration with other universities has been growing quite rapidly in recent years. In the period under review, in the mentioned areas, there were, for example, CAP (2017-2023) where FEE cooperated with another CTU part, University Center for Energy Efficient Buildings (UCEEB), EcoStor (which officially started in January 2024, but was prepared and approved in the period under review) where FEE participates on the project lead by University of Chemistry and Technology (VŠCHT) in work packages: Batteries and supercapacitors, Power-2-X, Solar-2-X, Molecular design in energy storage and conversion, Engineering of storage and conversion systems.

FEE is also active in the program EuroTeQ Collider, a new type of student project course organized within the EuroTeQ alliance, where students solve real-world challenges provided by a company or research institute. Students work in multidisciplinary teams and come from multiple faculties. Additionally, the Collider is open to all students from the partner schools, so the teams can also have foreign students.

3.7 **The evaluated unit's most significant interactions with the non-academic application/corporate sphere**

Recommendation: *Excellent!*

Response: Thank you for appreciation.

3.8 **System and support of technology transfer and intellectual property protection**

Recommendation: *It might be discussed in FEE whether the basic and applied research are well balanced. More importantly, it is necessary to perform the optimum exploitation strategy with respect to the results achieved.*

Response: We have established a new Technology Transfer Team (TTT) at the faculty, which is methodically managed by the Vice Dean for Cooperation with Industry and Commercialization, prof. Jan Vobecký, who has been working for a long time (2007-2025) in the private company ABB Switzerland Ltd. Semiconductors and Hitachi Energy as the Bipolar business unit portfolio manager of the company's IP department.

The TTT provides support in obtaining industrial property protection for results with application potential (inventions, utility models, trademarks, trade secret protection), contract preparation, market research, support for the establishment of spin-off and start-up companies. He works closely with the Rectorate's Technology Transfer Department. More information can be found in section 3.5.

3.9 **Strategy for setting up and support of spin-off firms or other forms of commercialisation of R&D&I results**:

Recommendation: - (any)

Response: Our newly established Technology Transfer Team (TTT) at the faculty in cooperation with the CVUT Technology Transfer and Fundraising Office (TTFO) supports the set-up of spin-off firms according to defined strategy: simple & transparent licensing of IP generated and owned by CVUT under standard conditions to the newly established CVUT spin-off. Starting from the proposal for commercialization, the new company staff is guided by TTT and TTFO teams through the initial legal

procedure up to the CVUT Tech s.r.o. Board of supervisors. Hereby, the set-up time of a spin-off is significantly shortened.

3.10 **The most significant individual awards for R&D&I**
Recommendation: *excellent*
Response: Thank you for appreciation.

3.11 **Recognition by the international R&D&I community (elected membership in international scientific societies, participation on the editorial boards of international scientific journals, invited lectures at institutions abroad etc.)**
Recommendation: *FEE might discuss how to set incentives for the others who are not yet internationally engaged.*
Response: In order to adopt good practices from abroad more widely, we have adopted a measure aimed at PhD students called "CTU FEE Grant: 'PhD Study with a Distinguished External Co-Supervisor'", which aims to promote quality supervision of PhD students and to establish a relationship with an expert with the potential to improve the quality of research of the PhD student and the department. This instrument is available only to departments with below average performance and it is intended both to contribute to the PhD income and to cover the student's travel and living expenses at the distinguished supervisor's workplace and the supervisor's stay at the FEE.
We have also launched a faculty program to financially support doctoral students' internships at foreign institutions. Similar support is provided to academic staff by the university, with the faculty participating financially.

3.12 **The most significant activities in the popularisation of R&D&I and communication with the public**
Recommendation: *Follow the example of sensor on line courses.*
Response: Covid restrictions in 2020-2022 have forced us to record our lectures and provide them as supplementary material to courses in general via our Moodle and CourseWare learning repositories. We are trying to expand our online course offering, for example, through the activities of the EuroTeQ joint executive program including micro certifications.

General recommendations
After the evaluation, the main points for improvement of the general assessment are related to:
1. **Recommendation:** *Improvement of the weak departments. Improvement of the already good FEE is the improvement of the relatively weak departments. The weak departments have to add new subjects, which are scientifically and socially attractive and interesting, namely:*
- Micro-grids (concerning the power engineering and economics of energy). This is the major current issue in Europe, including renewables and storage.
- Micro- and nano- engines, MEMS and linear motors (concerning the electrical machines department). For these activities, proper personnel have to be engaged.
Response: To support the R&D activities of "weak" departments (we rather officially call them departments with development potential, to speak positively about them), we use the same measure as mentioned in paragraph 3.11, "CTU FEE Grant: 'PhD Study with a Distinguished External Co-Supervisor'" which is aimed at departments placed in the latest quartil in department order sorted according to the R&D performance measured by our Criteria for the Evaluation of Scientific Research Activities at FEE. Another measure adopted to support these departments is Vice-Dean's Award for PhD-authored Papers in Top Journals which financially supports students who publish in the relevant

journals of Q1, Q2 according to their IF. Until now, we supported these students with the following results:

CTU FEE Grant: has been awarded 9 times since 2021. Targeted departments have participated as follows: K113 Electrotechnology 4x, K115 Electrical Power Engineering 1x, K116 Economics, Management, and Humanities 4x. The number of journal publications has increased in the targeted departments (battery performance and their sustainability, engine control, etc. ..).

Vice-Dean's Award was awarded 2x to Ing. F. Baum for two IF papers in IEEE Transaction on Power Electronics, Q1 (1., 2.).

2. **Recommendation:** *Intellectual property rights (IPRs). A carefully selected international patent agency will help in the optimum exploitation of the outcomes of the applied and basic research of FEE. The basis of collaboration will be royalties on their exploitation, thus not affecting the CTU budget.*

Response: We are using various European Patent Attorney offices according to the field of invention. For the cooperation with partners outside Europe, the non-European Patent Attorney offices of our partners are utilized. Czech Patent Attorneys are preferably committed to taking care of the locally protected IP by the Industrial Property Office of the Czech Republic.

We are striving for high quality IP with high commercialization potential. Our strategy for high royalties is based on supporting the patents with high content of attractive industrial secrets.

The share of US, Japanese and EU patents in the total number of patents in 2019-23 compared to 2014-18 was 27/62 and 12/53 respectively; see table. The numbers in 2019-20 are slightly higher than in other years due to the handling of large R&D projects where patents were one of the required outputs.

Result type / year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Patents US+Japan+EU	1	2	2	4	3	12	8	1	2	4
Patents totally	16	10	9	17	7	23	16	12	3	8

3. **Recommendation:** *The duration of PhDs. 4 years is a must. In order to avoid transient problems, a possible proposal could be the reduction of the maximum time of the PhD duration from 2N down to N+2, i.e. the reduction of the maximum time of the PhD duration from 8 years to 6 years.*

Response: In order to shorten the study period until the submission of the dissertation to the standard period (4 years), we are gradually taking a number of measures. At the university level, we have legislatively (restrictively) reduced the maximum time to submit a dissertation from 7 to 6 years in the Study and Examination Code in 2021. At the faculty level, we take more motivational measures, e.g. we award the Dean's Prize for an outstanding dissertation to those theses that are submitted in less than 5 years from the start of the candidate's studies, we directly financially motivate supervisors of those students who submit their theses within 4 or 5 years, at the departmental level, within the rules of distribution of financial resources, we bonus the submission of theses within the standard time (double weight compared to those submitted later), and we try to come up with other motivational measures. Here we show the numbers of students who have submitted a dissertation within a given number of years from enrolment, over a 10-year period covering the previous and current assessment period:

Year/ years	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
up to 4	5 (10%)	7 (14 %)	4 (9 %)	9 (14 %)	3 (6 %)	5 (11 %)	2 (6 %)	6 (15 %)	5 (19%)	7 (20%)
4 to 5	6 (13 %)	5 (10 %)	6 (14 %)	7 (11 %)	7 (14 %)	6 (13 %)	6 (17 %)	6 (15 %)	2 (7%)	10 (28%)

5 to 6	11 (23%)	5 (10 %)	8 (18 %)	6 (9 %)	5 (10 %)	9 (19 %)	3 (9 %)	3 (8 %)	2 (7 %)	1 (3 %)
6 to 7	26 (54%)	32 (65%)	26 (59%)	43 (66%)	34 (69%)	27 (57%)	23 (67%)	23 (61%)	18 (63%)	17 (49%)
Totally	48	49	44	65	49	47	34	38	27	35

In 2014-2018, the number of dissertations submitted within five years of enrolment was 23%, 24%, 23%, 25% and 20% respectively. In 2019-2023, the figures were 23%, 23%, 30%, 36% and 48%. It can be seen that in the last three years of the current evaluation period, the number of earlier submissions has been increasing, and even significantly in the last year.