Martin Trnečka

Curriculum Vitae

martin.trnecka@gmail.com
www.martin-trnecka.cz

Education

Aug 2019 **RNDr.**, *Computer Science*, Faculty of Science, Palacký University Olomouc
rerum naturalium doctor,
rigorous thesis: *Minimum description length in Boolean matrix factorization*

Feb 2017 **Ph.D.**, *Computer Science*, Faculty of Science, Palacký University Olomouc
doctor's degree,
dissertation thesis: *Decompositions of matrices with relational data: Fundations and algorithms*,
supervisor: prof. R. Bělohlávek

June 2011 **MSc.**, *Computer Science*, Faculty of Science, Palacký University Olomouc
masters's degree with honors,
master thesis: *Modern methods of data analysis and their application*

Aug 2009 **BSc.**, *Computer Science*, Faculty of Science, Palacký University Olomouc
bachelor's degree,
bachelor thesis: *Software plagiarism detection*, Rectors's award

Previous employment

from 2017 **Dept. of Computer Science**, *Faculty of Science, Palacký University Olomouc*
assistant professor,
deputy head of department for teaching (2022–2025),
deputy head of department for development (2019–2022)

2014–2017 **Dept. of Computer Science**, *Faculty of Science, Palacký University Olomouc*
assistant

2011–2014 **International Center for Information and Uncertainty (MCIN)**, *Dept. of Computer Science, Faculty of Science, Palacký University Olomouc*
researcher

2010–2012 **Dept. of Computer Science**, *Faculty of Science, Palacký University Olomouc*
webmaster of `www.inf.upol.cz` (2012–present),
network administrator

2009–2012 **Inven solution Co.**
head of internet shops division,
project manager,
web programmer

2008–2009 **Friendly Systems Co.**
web programmer

Grants and projects

2025 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,100,000 CZK)

2025 **employee, ESF OP JAK project**
project: *IQ UP: Modern and innovative approach to quality education at Palacký University Olomouc*,
project focused on the preparation for the reaccreditation of study programs

2024 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,300,000 CZK)

2023 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,700,000 CZK)

2023 **employee, Ministry of education, youth and sports – National recovery plan for higher education 2022–2024**
project: *Creation and accreditation of a new doctoral study program in law and digital technologies* (principal inverigators R. Bělohlavek and V. Stehlík)

2022 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,600,000 CZK)

2021 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,700,000 CZK)

2020 **principal investigator, IGA project of Palacký University Olomouc**
project: *Theory and algorithms for information processing* (1,500,000 CZK)

2020–2022 **principal investigator, Junior research grant of Palacký University Olomouc**
project: *Boolean matrix factorization and its connection to formal concept analysis and biclustering* (2,800,000 CZK)

2020 **principal investigator, FRUP project of Palacký University Olomouc**
project: *Innovations of selected technological courses provided by the Department of Computer Science*, project focused on the development of university infrastructure (205,000 CZK)

2015–2017 **research employee, project GAČR no. 15–17899S**
project: *Decompositions of matrices with Boolean and ordinal data: Theory and algorithms* (principal investigator R. Bělohlávek)

2011–2014 **research employee, ESF OP VK project**
project: *International center for information and uncertainty* (principal investigator J. Fiurášek)

Research visits

2018 **Inria Nancy – Grand-Est**, *France*
13 weeks, co-work with prof. A. Napoli

2013 **University of Wollongong**, *Australia*
5 weeks, spolupráce s co-work with prof. P. Eklund

2013 **University Blaise Pascal**, *France*
5 weeks, co-work with prof. E. Mephu Nguifo

2013 **University of Texas at El Paso**, *Texas, USA*
5 weeks, co-work with prof. V. Kreinovich

2012 **Binghamton University - State University of New York (SUNY)**, *New York, USA*
2 weeks, co-work with prof. R. Bělohlávek

2011 **University of Malaga**, *Spain*
1 week, co-work with prof. M. Ojeda-Aciego.

Awards

2025 Dean's awards for teachers

2024 Dean's awards for teachers

2020 Dean's awards for authors developing their field

2018 Dean's awards for authors developing their field

2011 Rector's award for work *Software plagiarism detection*

Membership

- Association for Computing Machinery (ACM)
- The Institute of Electrical and Electronics Engineers (IEEE)

- Mensa (Czech Republic)

Publication and citation summary (11/2025)

publications	20 papers in peer-reviewed IF journals, 24 papers in proceedings of international peer-reviewed conferences 33 Web of Science (WoS), 44 Scopus (Sco), 48 Google Scholar (GS)
citations	199 WoS, 329 Sco, 422 GS, without self-citations of all authors: 126 WoS, 210 Sco
H-index	7 WoS, 9 Sco, 10 GS

10 selected publications

Q1 Trnecka, M., Vyjidacek, R.: Revisiting the GreCon Algorithm for Boolean Matrix Factorization. *Knowledge-Based Systems 249* (2022), 108895. DOI 10.1016/j.knosys.2022.108895

CORE A* Konecny, J., Trnecka, M.: Boolean Matrix Factorization for Data with Symmetric Variables. In: *Proceedings of the 22th IEEE International Conference on Data Mining (ICDM 2022)*, pp. 1011–1016. DOI 10.1109/ICDM54844.2022.00123

Q1 Trnecka, M., Trneckova, M.: Model Order Selection for Approximate Boolean Matrix Factorization Problem. *Knowledge-Based Systems 227* (2021), 107184. DOI 10.1016/j.knosys.2021.107184

Q1 Belohlavek, R., Trnecka, M.: The 8M Algorithm from Today's Perspective. *ACM Transactions on Knowledge Discovery from Data 15* (2)(2021), article 22. DOI 10.1145/3428078

Q1 Trnecka, M., Trneckova, M.: An Incremental Algorithm for the Role Mining Problem. *Computers & Security 94* (2020), 101830. DOI 10.1016/j.cose.2020.101830

Q1 Belohlavek, R., Outrata, J., Trnecka, M.: Factorizing Formal Contexts using Formal Concepts and Iterative Usage of Essential Entries. *Information Sciences 489* (2019), 37–49. DOI 10.1016/j.ins.2019.03.001

Q1 Outrata, J., Trnecka, M.: Parallel Exploration of Partial Solutions in Boolean Matrix Factorization. *Journal of Parallel and Distributed Computing 123* (2019), 180 –191. DOI 10.1016/j.jpdc.2018.09.014

Q1 Belohlavek, R., Outrata, J., Trnecka, M.: Toward Quality Assessment of Boolean Matrix Factorizations, *Information Sciences* 459 (2018), 71–85. DOI 10.1016/j.ins.2018.05.016

CORE A* Belohlavek, R., Trnecka, M.: Handling Noise in Boolean Matrix Factorization. In: *Proceedings of the 26rd International Joint Conference on Artificial Intelligence (IJCAI 2017)*, pp. 1433–1439. DOI 10.24963/ijcai.2017/198

CORE A* Belohlavek R., Trnecka M.: Basic Level in Formal Concept Analysis: Interesting Concepts and Psychological Ramifications. In: *Proceedings of the 23rd International Joint Conference on Artificial Intelligence (IJCAI 2013)*, pp. 1233–1239.

Invited talks

2025 Divelit Co., lecture on topic: "UI and UX" (in Czech)

2025 Neurological clinic seminar, Olomouc, Czech Republic, lecture on topic: "LLM from a computer scientist's perspective" (in Czech)

2018 Inria Nancy – Grand-Est, France, lecture on topic: "Boolean matrix factorization from FCA perspective II."

2018 Inria Nancy – Grand-Est France, lecture on topic: "Boolean matrix factorization from FCA perspective I"

2013 University of Texas at El Paso, Texas, USA, lecture on topic: "Basic level of concepts"

2013 Universite Blaise Pascal, France, lecture on topic: "Boolean matrix factorization"

Other research-related activities

Reviews

- 40+ for peer-reviewed journals Applied Soft Computing, Information Sciences, International Journal of General Systems, International Journal of Data Science and Analytics, International Journal of Approximate Reasoning, Scientific Reports, Expert Systems With Applications, Signal processing, Transactions on Knowledge and Data Engineering, Knowledge-Based Systems and others
- 20+ for international peer-reviewed conferences and workshops CONCEPTS, AIST, IJCRS, SCAKD, CDUD, IJCAI, CLA, ICFCA, FCA4AI and others

Organization of conferences

- program committee member of international conferences and workshops: CONCEPTS, AIST, ICFCA, AIST, AIST, IJCRS, SCAKD, CDUD
- organization committee member of CLA 2018, Olomouc, Czech Republic
- program co-chair of CLA 2020 (with Francisco J. Valverde-Albacete and Sadok Ben Yahia), Tallinn, Estonia

Contract research

2025 employee on project: *Development of the UP Science and Technology Park and the DIGI2Health digital innovation hub*

2024–present cooperation with KMA technology platform (participation in 2 contract research projects)

2019 research cooperation with Seznam.cz Co. (together with R. Outrata)

2015 research cooperation with ČEZ Group (together with J. Outrata)

Teaching experience

Courses at Palacký University Olomouc

Computer networks 1
course for bachelor's students, 2015–2021 exercises, 2021–present lectures and exercises, extensive study materials were created for the course

Selected topics in computer science
newly created course for bachelor's students, 2024–present lectures

Web applications
newly created course for bachelor's students, 2022–2024 seminars, extensive study materials were created for the course

Web technologies
newly created course for master's students, 2014–present seminars, the course has been repeatedly updated and renamed over time

Information technology for law and legal science 1
newly created course for doctoral students, 2024–present, the course is conducted through in-person teaching and individual consultations, taught in English

Machine learning and data mining 1
course for master's students, 2021–present exercises, full preparation of exercises materials

Seminar for bachelor's thesis
course for bachelor's students, 2023–present seminars

Introduction to information technology
newly created course for bachelor's students, 2021–present lectures

User interfaces
course for bachelor's students, 2022–present seminars

Web development
newly created course for bachelor's students, 2021–present lectures and exercises, extensive study materials were created for the course

Algorithmic mathematics 3
course for bachelor's students, 2011–2017 exercises

Computer systems security
course for master's students, 2016–2021 exercises

Formal concept analysis
course for master's students, 2012–2018 exercises

Informatics propedeutics 1
course for bachelor's students, 2012 exercises

Information systems
course for bachelor's students, 2014–2020 lectures

Machine learning and data mining 2
course for master's students, 2021–2024 exercises

Operating systems 1
course for bachelor's students, 2015–2018 exercises

Parallel and distributed systems
course for master's students, 2021–2023 lectures, updated and redesigned course

Programming in Python
newly created course for master's students, 2018–2019 seminars

Programming in MATLAB
newly created course for master's students, 2017–2019 seminars

Mobile application development
course for bachelor's students, 2016–2020 two lectures focused on cross-platform development

Fundamentals of programming 3 (Java)
course for bachelor's students, 2015–2017 seminars

Supervised thesis

- 39 supervised bachelor thesis
- 40 supervised master thesis
- consultant of one disertation thesis: R. Vyjídáček, Boolean matrix factorization and biclustering in framework of formal concept analysis, 2024

Study materials

various study materials have been created for all taught courses, typically lecture slides, examples, exercises, and shorter study texts; below is a list of the most significant and comprehensive study materials

Computer networks 1
complete lecture slides, a textbook, and a course website with materials and exercise assignments were created for this course, all available online at `http://trnecka.inf.upol.cz/teaching/pos1/`

Web applications
a textbook, and a course website with materials and exercise assignments were created in cooperation with V. Pavlíková (Ph.D. student) for this course, all available online at `http://trnecka.inf.upol.cz/teaching/weba/`

Web development
complete lecture slides, a textbook, and a course website with materials and exercise assignments were created for this course, all available online at `http://trnecka.inf.upol.cz/teaching/web/`

Fundamentals of programming in Python
a textbook were created for this course, available online at `http://trnecka.inf.upol.cz/teaching`

Computer systems security
notes for exercise were created for this course, available online at `http://trnecka.inf.upol.cz/teaching`

Degree programme guarantor

preparation of acreditation materials and introduction of a new study program *Information technology* (Dept. of Computer Science, Faculty of Science, Palacký University Olomouc) in full-time and part-time form of study

2019–present guarantor of *Information technology* study program

Other teaching-related activities

- member of the state final examination committee for the study programs (from 2017)
- guarantor of courses within the *Further education of teaching staff* (DVPP courses)
- guarantor of study courses

Popular science publications (in Czech)

4. Trnečka, M.: CSS preprocesor SASS. *Matematika–Fyzika–Informatika 33 (4) (2024)*, 288–305.
3. Trnečka, M.: Moderní layout webových stránek. *Matematika–Fyzika–Informatika 28 (4) (2019)*, 294–306.
2. Trnečka, M.: Pokročilé optimalizace pro webové vyhledávače. *Matematika–Fyzika–Informatika 26 (2) (2017)*, 138–146.
1. Trnečka, M.: Základní optimalizace pro webové vyhledávače. *Matematika–Fyzika–Informatika 25 (3) (2016)*, 223–230.

Cooperation with secondary and primary schools

- lectures for secondary school students
- popularization of science at primary schools – involvement in project-based teaching (topics related to computer networks and artificial intelligence)

Olomouc, November 29, 2025

Martin Trnečka