Curriculum vitae

Matej Troják

Portfolio | GitHub | LinkedIn | mato.trojak@gmail.com | +420 728 655 059 | Brno, Czech Republic

Education

Masaryk University — Brno, Czech Republic

PhD in Fundamentals of Computer Science (thesis) — *2018 – 2023*

doctor of natural sciences conferred in Artificial intelligence and data processing (thesis) — *2020*

master's degree conferred in Bioinformatics and systems biology (thesis) — *2015 – 2018*

bachelor's degree conferred in Bioinformatics and systems biology (thesis) — *2012 – 2015*

Work and Research Experience

Recetox — Brno, Czech Republic

IT specialist — *2021 – 2023*

- spectrometric data processing and analysis
- development of Galaxy tools and Galaxy administration
- **MSMetaEnhancer** | GitHub
  - tool for semi-automatic mass spectra metadata annotation
  - mines multiple online databases and services for available data
- **Galaxy tools** | GitHub
  - development of Galaxy tools for analysis of mass spectra data
  - administration of UMSA Galaxy instance

CzechGlobe — Brno, Czech Republic

researcher and software developer — *2018 – 2022*

- development of a platform to semi-automatise experimentation using photobioreactors (BioArInEO)
- **DeviceControl** | GitHub
  - unified interface to control and measure data in specific cultivation devices
  - developed as a Python package for multiple platforms

Sybila — Brno, Czech Republic

systems biology researcher — *2014 – 2023*

- development of formal methods in computer science with application to systems biology
- a rule-based language called BioChemical Space language
- **eBCSgen** | GitHub
  - software tool developed in Python
  - maintenance and analysis of rule-based models
  - distributed using bioconda and a series of Galaxy tools
- **e-cyanobacterium** | WebPage
  - an instance of Comprehensive modelling platform
  - models and experiments online repository targeting cyanobacteria processes
- **Galaxy tools** | GitHub
  - development of Galaxy tools for analysis of biochemical models
  - administration of Biodivine Galaxy instance
- **mypPBR** | GitHub
  - minimalistic yet professional open-source low-budget photobioreactor

Skills

Programming: Python, R, MySQL, LaTeX, MATLAB

Technologies: Git, Unix, Galaxy, Conda

Languages: Slovak (Native), English (Professional), German (Elementary)

Teaching and tutoring: two semesters of seminar tutoring at IB111: Foundations of Programming in Python; supervision (3) and reviews (13) of bachelor's and master's theses

Publications

- Matej Troják, David Šafránek, Samuel Pastva, and Luboš Brim. **Rule-based Modelling of Biological Systems Using Regulated Rewriting**. *BioSystems* (225), Elsevier, 2023.
- Matej Troják, David Šafránek, Branislav Brozmann, and Luboš Brim. **eBCSgen 2.0: Modelling and Analysis of Regulated Rule-Based Systems**. Proceedings of the 20th *International Conference on Computational Methods in Systems Biology* (**CMSB**), p. 302-309, LNBI 13447, Springer, 2022.
- Matej Troják, Helge Hecht, Martin Čech, and Elliott James Price. **MSMetaEnhancer: A Python package for mass spectra metadata annotation**. *Journal of Open Source Software* 7(79), 2022.
- Matej Troják, David Šafránek, Lukrécia Mertová, and Luboš Brim. **eBCSgen: A Software Tool for Biochemical Space Language**. Proceedings of the 18th *International Conference on Computational Methods in Systems Biology* (**CMSB**), p. 356-361, LNBI 12314, Springer, 2020.
- Matej Troják, David Šafránek, Lukrécia Mertová, and Luboš Brim. **Executable Biochemical Space for Specification and Analysis of Biochemical Systems**. *PLoS ONE* 15(9), Public Library of Science, 2020.
- Matej Troják, David Šafránek, Luboš Brim, Jakub Šalagovič, and Jan Červený. **Executable Biochemical Space for Specification and Analysis of Biochemical Systems**. Proceedings of the 9th *International Workshop on Static Analysis and Systems Biology* (**SASB**), p. 91-116, ENTCS 350, Elsevier, 2018.
- Matej Troják, David Šafránek, Lukrécia Mertová, and Luboš Brim. **Parameter Synthesis and Robustness Analysis of Rule-Based Models**. Proceedings of the 12th *NASA Formal Methods* (**NFM**), p. 41-59, LNCS 12229, Springer, 2020.
- David, Šafránek, Matej Troják, Vojtěch Brůža, Tomáš Vejpustek, Jan Papoušek, Martin Demko, Samuel Pastva, Aleš Pejznoch, and Luboš Brim. **Barbaric Robustness Monitoring Revisited for STL* in Parasim**. Proceedings of the 17th *International Conference on Computational Methods in Systems Biology* (**CMSB**), p. 356-359, LNBI 11773, Springer, 2019.
- Nikola Beneš, Luboš Brim, Jan Červený, Samuel Pastva, David Šafránek, Jakub Šalagovič, and Matej Troják. **Fully Automated Attractor Analysis of Cyanobacteria Models**. Proceedings of the 22nd *International Conference on System Theory, Control and Computing* (**ICSTCC**), p. 354-359, IEEE, 2018.
- Matej Troják, David Šafránek, Jakub Hrabec, Jakub Šalagovič, Františka Romanovská, and Jan Červený. **E-Cyanobacterium.org: A Web-Based Platform for Systems Biology of Cyanobacteria**. Proceedings of the 14th *International Conference on Computational Methods in Systems Biology* (**CMSB**), p. 316-322, Springer, 2016.
- Tadeáš Děd, David Šafránek, Matej Troják, Matej Klement, Jakub Šalagovič, and Luboš Brim. **Formal Biochemical Space with Semantics in Kappa and BNGL**. Proceedings of the 6th *International Workshop on Static Analysis and Systems Biology* (**SASB**), p. 27-49, Elsevier, 2015.