

Ivan Radiček

Curriculum Vitae

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Overview

A seasoned software engineer with 15 years of technical experience and a PhD in Computer Science. Developed various systems — from full-stack web applications to various AI tools. Worked in many different settings — several startups, a university, and a large corporation (Microsoft). Especially passionate about learning new things and taking on new challenges.

Experience

Professional

- 2023–Present **Co-founder / CEO / Software engineer**, *Demiurg*, Croatia
Research on programming languages & compilers. Prototyping various embedded systems.
- Apr–Nov 2023 **Senior Software Engineer**, *nyāya*, Remote
Building ESG (Fintech) SaaS product backend.
- 2017–2023 **Senior (Research) Software Engineer**, *Microsoft*, Remote, PROSE team
Research and development of various AI tools for helping developers and beginner programmers; mentoring of young researchers and interns. Developed a technique to parse unstructured documents (e.g., logs, CSVs, HTML pages) into tabular data that performed 60% better than competition. Developed an AI tool that assists low-code users while programming - owned project from research prototype phase to shipping to a product with millions of users. Collaborated and contributed to various AI tools for developers, low-code/no-code users, and students. This also often involved building non-trivial fronted applications using TypeScript and React.
- 2013–2017 **Project (Research) Assistant**, *TU Wien*, FORSYTE group, Vienna, Austria
Research on systems for providing automated feedback to students learning programming. Developed a system that provides students with semi-automated performance-related feedback in a fraction of second. Developed a system that provides functional feedback to students learning to program in Python, C, and Java. The developed tool provides fully automated feedback in 97% of cases in under 10s on average. Also built several frontend applications using JavaScript.
- Sep–Dec 2015 **Intern**, *MPI-SWS*, Saarbrücken, Germany
Devised a type/logic-based relational cost analysis.
- 2008–2013 **Software developer and system engineer**, *IMENIK D.O.O.*, Zagreb, Croatia
Worked on backend and fronted of a national phone registry. The backend needed to process several millions of documents per day and consolidate with existing data. Built a ad crawler for Croatian web (including JS evaluation)

Activities

- 2021 **Introduction to functional programming in F#**, *Future Hub - Computer Science Summer School*, A series of lectures for advance high-school and university students
- 2021 **Rust and advanced type systems**, *HACK project, Križevci*, A series of lectures given to advanced university students
- 2014 **Vienna Summer of Logic**, *Volunteer Collaborator of the Organization*, July 9th to 24th, Vienna, Austria
- 2012 **Python workshop**, *Culture Shock festival, Križevci*, Croatia
Teaching Python & OO fundamentals.
- 2008 **Computing and advanced algorithms teaching**, *Computing club Križevci (Informatički klub Križevci)*, Križevci, Croatia
Preparing high school students for computing competition (in C).

Education

Academic

- 2014–2020 **PhD in Computer Science**, *TU Wien*, Vienna, Austria, Thesis: *Automated Feedback Generation in Introductory Programming Education (A Dynamic Program Analysis Approach)*
- 2010–2012 **Master of Science in Computing**, *University of Zagreb, Faculty of Electrical Engineering and Computing*, Zagreb, Croatia, Thesis: *Design of Bayesian Network Based on Stochastic Simulation Reasoning*
- 2006–2010 **Bachelor of Science in Computing**, *University of Zagreb, Faculty of Electrical Engineering and Computing*, Zagreb, Croatia, Thesis: *Lightweight Formal System Verification*

Summer Schools

- April, 2016 **Spring School on Logic and Verification 2016**, Vienna, Austria
- August, 2015 **Summer School Marktoberdorf 2015**, Marktoberdorf, Germany
- July, 2014 **SAT/SMT Summer School 2014**, Semmering, Austria, (Award of Excellence)

Publications

- Repair Is Nearly Generation: Multilingual Program Repair with LLMs**, *arxiv*, 2022, with Harshit Joshi, José Pablo Cambronero Sánchez, Sumit Gulwani, Vu Le, and Gust Verbruggen
- Neurosymbolic Repair for Low-Code Formula Languages**, *OOPSLA*, 2022, with Rohan Bavishi, Harshit Joshi, José Pablo Cambronero Sánchez, Anna Fariha, Sumit Gulwani, Vu Le, and Ashish Tiwari
- NL2Viz: Natural Language to Visualization via Constrained Syntax-Guided Synthesis**, 2022, *FSE*, with Zhengkai Wu, Vu Le, Ashish Tiwari, Sumit Gulwani, Arjun Radhakrishna, Gustavo Soares, Xinyu Wang, Zhenwen Li, and Tao Xie
- Programming by Rewards**, *arxiv*, 2020, with Nagarajan Natarajan, Ajaykrishna Karthikeyan, Prateek Jain, Sriram K. Rajamani, Sumit Gulwani, and Johannes Gehrke
- Structure Interpretation of Text Formats**, *OOPSLA*, 2020, with Sumit Gulwani, Vu Le, Arjun Radhakrishna, and Mohammad Raza
- Automated Clustering and Program Repair for Introductory Programming Assignments**, *PLDI*, 2018, with Sumit Gulwani and Florian Zuleger
- Monadic Refinements for Relational Cost Analysis**, *POPL*, 2018, with Gilles Barthe, Marco Gaboardi, Deepak Garg, and Florian Zuleger
- Feedback Generation for Performance Problems in Introductory Programming Assignments**, *FSE*, 2014, with Sumit Gulwani and Florian Zuleger

Tools

- clara**, <https://github.com/iradicek/clara>, A tool for automated clustering and repair of introductory programming assignments

Awards

- Verification Mentoring Workshop Scholarship Award**, *Scholarship to attend the Verification Mentoring Workshop (VMW) at CAV*, San Francisco, USA
- Programming Language Mentoring Workshop Scholarship Award**, *Scholarship to attend the SIGPLAN Programming Languages Mentoring Workshop (PLMW) at POPL*, Mumbai, India

Skills

- Languages PYTHON (professional & academic, 15+ years), C# (professional & academic, 10+ years), F# (professional, 2 years), clojure (professional, 6 months), OCAML (intermediate knowledge), Rust (intermediate knowledge), JAVASCRIPT/TYPESCRIPT (intermediate knowledge), REACT (intermediate knowledge), C (intermediate knowledge), JAVA (basic knowledge), COQ

Tools GNU/LINUX, git, SVN, L^AT_EX, virtualization, PostgreSQL, MySQL.

Technologies Program synthesis, formal methods, type systems, programming languages, DSLs, compilers, program repair, program analysis, verification, logic, basic ML (neural networks, LLMs).

Languages

Croatian Native speaker

English Fluent

German Basic understanding