Ivan Gavran

ivan.gavran7@gmail.com | **ivan-gavran.github.io** | **dblp profile**

EXPERIENCE

2021 – current

Research Engineer, Informal Systems, Vienna

- o Audited blockchain systems (including Celestia, NeutronDex, Anoma, dydx…) across the stack and technologies (most commonly, **Rust, Go, Solidity**)
- o Defined the team's audit methodology, using threat modelling for code review and **TLA+** and **Quint** for verification
- o Implemented Modelator and Atomkraft, tools for model-based testing
- o Designed an LLM-powered system to assist auditors when writing formal models. With improved models, implemented an agentic framework to assist auditors in the whole process of an audit

2016 – 2021

PhD Researcher, Max Planck Institute for Software Systems, Kaiserslautern

- o Created a multi-robot system `Antlab`, which takes a declarative specification and synthesizes *correct-by-construction* executions. The system was implemented for Turtlebots, in **ROS.**
- o Created `LTLTalk`, a tool that bridges the gap between natural and formal specifications. `LTLTalk` is implemented in **Python**, **Java,** and **Javascript** and based on my work on learning LTL formulas from finite samples
- o Developed the algorithm that interleaves **automata learning** with **reinforcement learning** to handle non-Markovian rewards

2013 – 2016

Researcher Engineer, Bellabeat Inc., Zagreb

- o Developed signal analysis algorithms to detect fetal heartbeat using **Matlab/Octave**.
- o Automated the testing process for firmware updates obtained by external contractors, which enabled a more efficient and reliable collaboration.

EDUCATION

- o PhD in computer science, TU Kaiserslautern, 2022 (summa cum laude)
- o Master in Mathematics and Informatics, University of Zagreb, 2013 (summa cum laude)
- o Bachelor in Mathematics, University of Zagreb, 2011 (summa cum laude)

VOLUNTEER WORK

2017 – 2021

Penkala, association of young Croatian researchers

- o Co-founded and led the association from zero to ~1000 members, with a yearly conference attracting ~150 participants and an active podcast and blog platform