Georgy Lukyanov

Curriculum Vitae

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I'm a software engineer with expertise in formal software verification and typed function programming. I am currently contracted by Runtime Verification Inc to work on formal verification of blockchain smart contracts and associated formal software verification tools. Prior to this, I was a PhD student at Newcastle University, UK, working on software verification by symbolic execution and functional programming.

Work Experience

Jun 2021 – Present **Formal Verification Engineer**, Runtime Verification Inc, Remote.
Security audit and formal verification of Ethereum and Algorand smart contracts. Tool development in K, Haskell and Python.

Jun 2015 – Jun 2017 **Software Engineer**, Statzilla, Rostov-on-Don, Russia.
Machine learning, statistics and digital signal processing. Web programming.

Research Visits

Feb 2020 – Apr 2020 **Vrije Universiteit Brussel**.
I worked with Dominique Devriese and Steven Keuchel on Katamaran — a Coq-embedded subset of the SAIL instruction-set architecture specification language. My contributions were a generic separation logic interface and a disjoint-heap model for it, complete with a soundness proof with respect to SAIL's operational semantics.

Apr 2019 **TU Wien and RUAG Space Austria**.
I visited for two weeks to present updates on the verification framework for the REDFIN processor and work on new verification examples.

Jul 2018 **Cambridge University Computer Laboratory**.
I spent a week there to meet researchers from Programming, Logic, and Semantics and Computer Architecture groups and get a closer look at the SAIL language. I gave a presentation at the department seminar.

Selected Research Publications

[1] Steven Keuchel, Sander Huyghebaert, Georgy Lukyanov, and Dominique Devriese. "Verified Symbolic Execution with Kripke Specification Monads (and No Meta-Programming)". In: *ICFP 2022*. Full text (Open Access).

[2] Georgy Lukyanov, Andrey Mokhov, and Jakob Lechner. "Formal Verification of Spacecraft Control Programs". In: *ACM Trans. Embed. Comput. Syst.* (2020). Full text.

[3] Andrey Mokhov, Georgy Lukyanov, Simon Marlow, and Jeremie Dimino. "Selective Applicative Functors". In: *ICFP 2019*. Full text (Open Access).

[4] Andrey Mokhov, Georgy Lukyanov, and Jakob Lechner. "Formal Verification of Spacecraft Control Programs (Experience Report)". In: *Haskell Symposium 2019*. Full text (Open Access).

[5] Georgy Lukyanov and Andrey Mokhov. "Concurrency Oracles for Free". In: *Proceedings of the International Workshop on Algorithms & Theories for the Analysis of Event Data 2018*. Full text (Open Access).

Education

2017 – 2022 **PhD in Computer Engineering**, *Newcastle University*, UK.

2015 – 2017 **M.Sc. in Computer Science (with distinction)**, *Southern Federal University*, Russia.

2011 – 2015 **B.Sc. in Applied Mathematics**, *Southern Federal University*, Russia.