Sergei Stepanenko

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Research Interests

I am interested in formal verification, programming language design, compilers, type systems, and functional programming. To date, I have contributed to the verification of an idealized model of hypervisors, the propositional semantics of generalized algebraic datatypes, and the denotational semantics of various types of continuation manipulations.

Publications

PLDI 2023
VMSL: A Separation Logic for Mechanised Robust Safety of Virtual Machines Communicating above FF-A
Zongyuan Liu, Sergei Stepanenko, Jean Pichon-Pharabod, Amin Timany, Aslan Askarov, and Lars Birkedal
My contribution: I have contributed to the definition of the hypervisor model, the separation logic rules for it, and the proof of the fundamental lemma.

POPL 2024
The Essence of Generalized Algebraic Data Types
Filip Sieczkowski, Sergei Stepanenko, Jonathan Sterling, and Lars Birkedal
My contribution: I have contributed to the definition of the semantic model, the proof of soundness of the language, and its extension to include effects such as state. This demonstrates that GADTs are orthogonal to additional computational language features.

Talks

INRIA	*The Essence of Generalized Algebraic Data Types*	**Remote**	*2023*
POPL	*The Essence of Generalized Algebraic Data Types*	**Remote**	*2024*

Community Service

PLDI	*Committee Member in Artifact Evaluation Committee*	*2024*
IJCAR	*External reviewer*	*2024*

Education

BSc Computer Science	*Southern Federal University*	**Rostov-on-Don, Russia**	*2016-2020*
MSc Computer Science	*Aarhus University*	**Aarhus, Denmark**	*2020-2023*
PhD Computer Science	*Aarhus University*	**Aarhus, Denmark**	*2020-present*

Professional Experience

Juspay, Haskell/Purescript Developer **Remote** *05/2019 - 11/2019*
A member of an external consulting group involved in porting Juspay's payment framework to Haskell/Purescript. My duties involved providing methodology and examples of using free monads to build modular projects in functional languages.

Teaching

Compilation	*TA, Aarhus University*	**Fall**	*2021*
Distributed Systems and Security	*TA, Aarhus University*	**Fall**	*2022*
Computability and Logic	*TA, Aarhus University*	**Spring**	*2023*
Compilation	*TA, Aarhus University*	**Fall**	*2023*
Computer Architecture, Networks and Operating Systems	*TA, Aarhus University*	**Spring**	*2024*

Skills

- **Formal Verification**
- **Type Systems**
- **Compilers**
- **PL Theory**
- **Semantics of PL**
- **Separation Logic**

Technologies

- **Coq**
- **Iris**
- **Haskell**
- **OCaml**
- **Rust**
- **LaTeX**
- **Bash**
- **Git**
- **Linux**
- **Nix**

Languages

- **English** — Fluent
- **Russian** — Native
- **Danish** — A2