

Robert Schenck

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INTERESTS Type systems, functional programming, and programming language design/implementation at the interplay between theory and application—I like (and believe in!) principled approaches/techniques for practical, real-world problems.

EXPERIENCE *Associate Research Scientist* 2025 - Present
Northeastern University, Boston, USA

- Research on Remora, a rank-polymorphic array language. Advised by Olin Shivers.

Postdoctoral Researcher 2025
Vrije Universiteit Amsterdam, Netherlands

- Research on programming language-based methods and techniques for security. Advised by Klaus von Gleissenthall.

EDUCATION *Ph.D. Computer Science* 2020 - 2024
DIKU, University of Copenhagen, Denmark

- My PhD research focused on type systems and automatic differentiation in the context of [Futhark](#), a functional array programming language. Advised by Cosmin E. Oancea, Troels Henriksen, and Fritz Henglein.
- Thesis: **Two Things I Did: Parallel Differentiation and Rank Polymorphism** ([PDF](#)).

M.Sc. Computer Science 2017 - 2020
International Max Planck Research School for Computer Science
Saarbrücken, Germany

- Thesis: **Sum types in Futhark** ([PDF](#)).

B.A. Physics 2011-2015
Brown University, Providence, USA
Honors: IBM Watson Scholarship

RESEARCH

PRE-PRINTS

1. Robin Webbers, **Robert Schenck**, Alp Adnan Basar, Kristina Sojakova, Klaus v. Gleissenthall. **Pantomime: Simulation-Based Leakage Proofs for Hardware Side-Channel Security**. ([PDF](#))
2. Nikolaž Hey Hinnerskov, **Robert Schenck**, Cosmin Oancea. **Verifying Properties of Index Arrays in a Purely-Functional Data-Parallel Language**. ([PDF](#))

PUBLISHED

3. **Robert Schenck**, Nikolaj Hey Hinnerskov, Troels Henriksen, Magnus Madsen, Martin Elsmann. **AUTOMAP: Inferring Rank-Polymorphic Function Applications with Integer Linear Programming**. In *Proceedings of the ACM on Programming Languages, Volume 8, Issue OOPSLA2*, [OOPSLA '24](#). ([PDF](#))
4. **Robert Schenck**, Ola Rønning, Troels Henriksen, and Cosmin E. Oancea. **AD for an Array Language with Nested Parallelism**. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, [SC '22](#). Dallas, USA. November, 2022. ([PDF](#))
5. Martin Elsmann, Fritz Henglein, Robin Kaarsgaard, Mikkel K. Mathiesen, and **Robert Schenck**. **Combinatory Adjoints and Differentiation**. In *Ninth Workshop on Mathematically Structured Functional Programming*, [MSFP '22](#). Munich, Germany. April, 2022. ([PDF](#))

TALKS

- **AUTOMAP: Inferring Rank-Polymorphic Function Applications with Integer Linear Programming**.
 - Talk at [OOPSLA '24](#). Pasadena, California. October, 2024.
 - Invited talk at [IMDEA](#). Madrid, Spain. August, 2024.
 - Extended abstract talk at [ARRAY '24](#). Copenhagen, Denmark. June, 2024.
- **AD for an Array Language with Nested Parallelism**. [SC '22](#). Dallas, USA. November, 2022.

TEACHING

Vrije Universiteit Amsterdam

- Supervised the following B.Sc. thesis:
 - Yves Mangano: Mitigating Timing-Based Side-Channel Attacks via Branch Balancing (2025)

University of Copenhagen

- Advanced Programming, Teaching Assistant 2018, 2020, 2024
- Data Parallel Programming, Teaching Assistant 2021
- Co-supervised (with Fritz Henglein) the following M.Sc. theses:
 - Trine Dag Randløv: Toward a Monadic Functional Machine Model for Computability and Complexity Theory: Finite and Pushdown Automata. (2023)
 - Ulrik Elmelund Petersen and Einar Rasmussen: Design and Implementation of a Compiler for Fréchet. (2022)

MISC.

- Hold US and German citizenship.
- FAA-licensed VFR and IFR airplane pilot.