

# Robert Schenck

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<b>INTERESTS</b>	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.	
<b>EXPERIENCE</b>	<i>Associate Research Scientist</i> Northeastern University, Boston, USA • Research on Remora, a rank-polymorphic array language. Advised by Olin Shivers.	2025 - Present
	<i>Postdoctoral Researcher</i> Vrije Universiteit Amsterdam, Netherlands • Research on programming language-based methods and techniques for security. Advised by Klaus von Gleissenthall.	2025
<b>EDUCATION</b>	<i>Ph.D. Computer Science</i> DIKU, University of Copenhagen, Denmark • My PhD research focused on type systems and automatic differentiation in the context of <a href="#">Futhark</a> , a functional array programming language. Advised by Cosmin E. Oancea, Troels Henriksen, and Fritz Henglein. • Thesis: <b>Two Things I Did: Parallel Differentiation and Rank Polymorphism</b> ( <a href="#">PDF</a> ).	2020 - 2024
	<i>M.Sc. Computer Science</i> International Max Planck Research School for Computer Science Saarbrücken, Germany • Thesis: <b>Sum types in Futhark</b> ( <a href="#">PDF</a> ).	2017 - 2020
	<i>B.A. Physics</i> Brown University, Providence, USA Honors: IBM Watson Scholarship	2011-2015
<b>RESEARCH</b>		
<b>PRE-PRINTS</b>	<ol style="list-style-type: none"><li>Robin Webbers, <b>Robert Schenck</b>, Alp Adnan Basar, Kristina Sojakova, Klaus v. Gleissenthall. <b>Pantomime: Simulation-Based Leakage Proofs for Hardware Side-Channel Security.</b> (<a href="#">PDF</a>)</li><li>Nikolaj Hey Hinnenskov, <b>Robert Schenck</b>, Cosmin Oancea. <b>Verifying Properties of Index Arrays in a Purely-Functional Data-Parallel Language.</b> (<a href="#">PDF</a>)</li></ol>	

**PUBLISHED**

3. **Robert Schenck**, Nikolaj Hey Hinnenskov, Troels Henriksen, Magnus Madsen, Martin Elsman. **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 Elsman, 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.