

Daniel Gratzer

Postdoctoral Researcher, Aarhus University
Curriculum Vitae and Publication List

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Employment

- **Aarhus University** Postdoctoral Researcher (Fall 2023 – Present)
Supervised by [Lars Birkedal](#)

Education

- **Aarhus University** PhD (Fall 2018 – Fall 2023)
(Masters GPA: 12.0/12.0)
Thesis: **Syntax and semantics of modal type theory**
Advised by [Lars Birkedal](#)
- **Carnegie Mellon University** Bachelors of Science (Fall 2014 – Spring 2018)
(GPA: 3.73/4.00. Dean’s List for 5 semesters. University Honors)
Honors Thesis: **The Next 700 Failed Step-Index-Free Logical Relations**
Supervised by Karl Cray

Research Visits

- **Chalmers University** with Thierry Coquand March 2022–June 2022
- **University of Paris** with Adrien Guatto December 2021
- **Aarhus University** with Lars Birkedal June 2017–August 2021

Publications

In my field conferences are the typical venue and a conference publication is full peer-reviewed research paper. While all conferences were ranked B or higher, several are rated at A* by [the Australian CORE rankings](#). This signifies that they are in the top 4% of CS conferences. CORE rankings for journals ceased in 2020, but in the latest ranking two of the journal below were rated at A, signifying that they were within the top 10% of computer science journals.

14. **Towards univalent reference types** 2023
Jonathan Sterling, Daniel Gratzer, Lars Birkedal
To appear in Computer Science Logic 2024
13. **Strict universes for Grothendieck topoi** 2023
Daniel Gratzer, Michael Shulman, Jonathan Sterling
To appear in Theory and Applications of Categories
12. **mitten: a flexible multimodal proof assistant** 2023
Philipp Stassen, Daniel Gratzer, Lars Birkedal
TYPES 2022 Post-proceedings
11. **Under lock and key: a proof system for a multimodal logic** 2023
G.A. Kavvos, Daniel Gratzer
Bulletin of Symbolic Logic
10. **A stratified approach to Löb induction** 2022
Daniel Gratzer, Lars Birkedal
Formal Structures in Computation and Deduction (FSCD)
9. **Normalization for Multimodal Type Theory** 2022
Daniel Gratzer
Logic in Computer Science (LICS)
CORE A* flagship conference
Selected for extended version (181 submitted, 63 accepted, ~10 extended versions)
8. **A Cubical Language for Bishop Sets** 2022
Jonathan Sterling, Carlo Angiuli, Daniel Gratzer
Logical Methods in Computer Science (LMCS)
CORE A journal

7. **Modalities and Parametric Adjoints** 2022
 Daniel Gratzer, Evan Cavallo, G.A. Kavvos, Adrien Guatto, Lars Birkedal
Transactions on Computational Logic (ToCL)
 CORE A journal
6. **Multimodal Dependent Type Theory** 2021
 Daniel Gratzer, G.A. Kavvos, Andreas Nuyts, Lars Birkedal.
Logical Methods in Computer Science (LMCS)
 CORE A journal
5. **Transfinite Iris: Resolving an Existential Dilemma of Step-Indexed Separation Logic** 2021
 Simon Spies, Leonard Gäher, Daniel Gratzer, Joseph Tassarotti
 Robbert Krebbers, Derek Dreyer, Lars Birkedal
Programming Language Design and Implementation (PLDI)
 CORE A* flagship conference
4. **Multimodal Dependent Type Theory** 2020
 Daniel Gratzer, G.A. Kavvos, Andreas Nuyts, Lars Birkedal.
Logic in Computer Science (LICS)
 CORE A* flagship conference
 Selected for extended version (174 submitted, 69 accepted, ~10 extended versions)
3. **Implementing a Modal Dependent Type Theory** 2019
 Daniel Gratzer, Jonathan Sterling, Lars Birkedal.
International Conference on Functional Programming (ICFP)
 CORE A* flagship conference
 Distinguished paper (119 submissions, 39 accepted and 4 distinguished papers).
2. **Cubical Syntax for Reflection-Free Extensional Equality** 2019
 Jonathan Sterling, Carlo Angiuli, Daniel Gratzer.
Formal Structures in Computation and Deduction (FSCD)
 Best Junior Researcher Paper
1. **Managing Obligations in Higher-Order Concurrent Separation Logic** 2019
 Aleš Bizjak, Daniel Gratzer, Robbert Krebbers, Lars Birkedal.
Principles of Programming Languages (POPL)
 CORE A* flagship conference

Talks

I have grouped talks by the research they present. Invited talks—as opposed to conference talks—are highlighted.

- **Syntax and semantics of modal type theory**
 - Upcoming **Invited talk** at Homotopy Type Theory and Computation 2024
 - **Invited talk** at Homotopy Type Theory Electronic Seminar Talks (HoTTEST) 2023
 - **Invited talk** at Bergen University, Type Theory Seminar 2023
- **Controlling unfolding in type theory**
 - **Invited talk** at Second WG6 meeting 2023
- **Modalities and Parametric Adjoints**
 - Conference talk at *TYPES* 2021
- **Normalization for multimodal type theory**
 - Conference talk at *Logic in Computer Science* 2022
 - **Invited talk** at Chalmers University, ProgLog Seminar 2022
 - Conference talk at *TYPES* 2021
- **A stratified approach to Löb induction**
 - Conference talk at *Formal Structures for Computation and Deduction* 2022
- **Sketching type theories**

- **Invited talk** at University of Lyon, Choccola Seminar 2021
- **Multimodal Dependent Type Theory**
 - Workshop talk at *International Congress on Mathematical Software* 2020
 - Conference talk at *Logic in Computer Science* 2020
 - Conference talk at *TYPES* 2020
 - **Invited talk** at Stockholm University, Logic Seminar 2020
 - **Invited talk** at IT University of Copenhagen, PLZ Seminar 2020
 - **Invited talk** at University of Paris 2019
- **Implementing a Modal Dependent Type Theory**
 - Conference talk at *International Conference on Functional Programming* 2019
 - **Invited talk** at *Computer Science Day in Aarhus University* 2019
- **Managing Obligations in Higher-Order Concurrent Separation Logic**
 - Conference talk at *Principles of Programming Languages* 2019

Teaching and Service

- **Program committee member** for MFPS (2022), HoTT/UF (2024)
- **Layout Editor** for LMCS (Spring 2019 – Spring 2021)
- **External reviewer** for CSL, ESOP, POPL, ITP, ICFP, JFP, LICS, and MSCS.
- **Teaching at Aarhus University**
 - Teaching assistant for Compilers (Fall 2022)
 - Co-organizer for Categorical Type Theory Seminar (Spring 2021)
 - Co-organizer for Category Theory (Fall 2019, Fall 2020)
 - Teaching assistant for Program Analysis and Verification (Fall 2018)

In addition to the above, I have co-advised masters theses and projects with Lars Birkedal.
- **Teaching at Carnegie Mellon University**
 - Teaching assistant for Constructive Logic (Fall 2017)
 - Teaching assistant for Practical Foundations of Programming Languages (Spring 2016)
 - Teaching assistant for Introduction to Functional Programming (Spring 2015 – Fall 2015)