Aloïs Rosset

PhD at the Vrije Universiteit Amsterdam in theoretical computer science.
Areas of particular interest are Category Theory, Formal Methods, and Logic.

CONTACT

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INTERESTS

- Category Theory
- Formal methods
- Logic
- Monads
- Functional programming
- Interactive theorem provers
- Toposes

SKILLS

- Independence
- Precision
- Presentation

TALKS / SEMINARS

Each first-author paper was presented at the corresponding conference. Here are the additional presentations:

- VU TCS 13 Feb 2020
- NetTCS 29 Nov 2021
- VU TCS 12 May 2023
- NetTCS 26 Oct 2023
- SYCO12 15 April 2024 🏆
  (Best presentation award)

OUTREACH

- **Member** of the IPA PhD council, 2023-2025, a Dutch institute organising events for PhDs, including Summer schools.
- **Co-organiser** of the Dutch PhD Logic 2024 at VU Amsterdam (Yearly Dutch Seminar)

LANGUAGES

- **French**: Native
- **English**: Excellent
- **German**: Intermediate (B2)
- **Dutch**: Basic (B1)

REFERENCES

- **Jörg Endrullis**
- **Helle Hvid Hansen**
- **Maaike Zwart**

SELECTED PROJECT

Monads and Universal Algebra in Program Semantics
PhD Research Project | May 2020 – May 2025

- Studied monads and their compositional properties via distributive laws. Proved constructively the correspondence between distributive laws and composite theories. Developed a method to obtain practical algebraic presentations of composite monads.
- Studied weak distributive laws via so-called semifree monads. Proved that algebraic presentations of semifree monads can be derived uniformly from algebraic presentations of their base monad.

PUBLICATIONS

- [**R**] Uniform Monad Presentations and Graph Quasitoposes (PhD Thesis)
- [**R**HE] Characterisation of LT-topologies on simplicial sets, bicoloured graphs, and fuzzy sets (TbiLLC'23 Post-proceedings)
- [**R**ZHE] Correspondence between Composite Theories and Distributive Laws (CMCS'24)
- [**R**] Partially simple graphs are Quasitoposes (TbiLLC'23)
- [**R**OE] Fuzzy Presheaves are Quasitoposes (ICGT'23)
- [**R**HE] Algebraic presentation of Semifree monads (CMCS'22)
- [OE**R**] Graph rewriting and Relabeling with PBPO+ : A unifying theory for Quasitoposes (Journal JLAMP'23)
- [OE**R**] Graph rewriting and Relabeling with PBPO+ (ICGT'21)

Collaborators   H = Helle Hvid Hansen   E = Jörg Endrullis
O = Roy Overbeek   Z = Maaike Zwart

EDUCATION

PhD
Th. Comp. Sc.
2020 - May 2025

- Vrije Universiteit Amsterdam. Thesis in 2 Parts.
  - Part I on monads and distributive laws.
  - Part II on quasitoposes in graph rewriting.

M.Sc. + B.Sc.
Mathematics
2014 - 2019

- Swiss Institute of Technology (EPFL).
  Erasmus exchange in 3rd year at University of Bristol.
  - **Master thesis:** "Blakers-Massey Theorem from the perspective of Homotopy Type Theory"
  - **Master project:** "Model Theory & Vaught Theorem"
  - **Bachelor thesis**: "Gödel's Incompleteness"

TEACHING

Co-lecturer

- Logic and Modelling, *2023* (Bachelor CS Year 2)
  - Responsible of lectures on modal logic.
  - Adapted content from different existing materials
  - Rewrote and adapted exercises & solutions

Teaching assistant

- Term rewriting systems, *2022-2024*
  - Rewrote exercises & solutions, and graded exams.
- Analytical geometry, *2018-2019*

Design of entrance exam

- Cours Euler (EPFL) : special cursus for children with high mathematical potential, *2019*.