

Thobias Kvalvik Høivik

Førde, Norway

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Research interests

Parameterized complexity, graph games, algorithms and complexity theory, mathematical foundations of computation, computational algebra, combinatorics, and structural graph theory.

Education

Western Norway University of Applied Sciences

2024–present

Bachelor in Information Technology, specialization in Machine Learning and Artificial Intelligence Førde, Norway

- Expected completion: 2027.
- Current GPA: 4.53/5.0, ECTS-weighted over combined graded coursework.
- Completed 160 ECTS during the first two years of study, including 150 graded ECTS and 10 pass/fail ECTS.
- Bachelor programme supplemented with additional mathematics and theoretical computer science coursework at the University of Oslo alongside full-time studies at HVL.

University of Oslo

2025–2026

Single courses at the Department of Mathematics

Oslo, Norway

- Completed additional coursework in mathematical logic, advanced linear algebra, abstract algebra, and real analysis.
- Courses taken independently alongside full-time bachelor studies at HVL.

Publications

Thobias Kvalvik Høivik and Erlend Raa Vågset.

2026

Edge Geography is XNLP-hard for Pathwidth and in XP for Tree-Partition Width Accepted at the European Symposium on Algorithms, ESA 2026.

Research experience

Parameterized Complexity of Edge Geography Games

2025–2026

Joint work with Erlend Raa Vågset

HVL

- First-author project studying Edge Geography parameterized by pathwidth and related width measures.
- Proved XNLP-hardness for Edge Geography parameterized by pathwidth.
- Developed an XP algorithmic framework for Edge Geography on graphs given with bounded-width tree-partition structure.
- Implemented the algorithmic framework in Python and validated it against a classical minimax solver on generated test instances.
- Paper accepted at ESA 2026.

Selected coursework

Mathematics and foundations	Groups, Rings and Fields; Real Analysis; Mathematical Logic; Advanced Linear Algebra; Discrete Mathematics; Advanced Discrete Mathematics.
Computer science	Algorithms and Data Structures; Distributed Systems and Networking Technology; Databases; Operating Systems; Programming and Software Development.
Additional preparation	Independent study in algebra, topology, analysis, logic, and theoretical computer science alongside the standard bachelor programme.

Selected grades

Groups, Rings and Fields	A
Discrete Mathematics I	A
Advanced Discrete Mathematics	A
Algorithms and Data Structures	A
Mathematical Logic	B
Advanced Linear Algebra	B

Teaching and mentoring

Student Assistant 2025–present
Western Norway University of Applied Sciences Førde, Norway

- Assisted in courses including Discrete Mathematics, Introduction to Mathematics, and Distributed Systems and Networking Technology.
- Guided students through exercises, problem solving, and coursework.
- Graded assignments and provided academic feedback.

Mathematics Mentor Spring 2025
Western Norway University of Applied Sciences Førde, Norway

- Provided individual academic support and mathematics guidance to a student.

Projects

Mathematics notes repository

Maintains a personal repository of self-written mathematical notes, worked exercises, and \LaTeX -formatted summaries in topics including abstract algebra, real analysis, logic, algorithms, and complexity theory.

Microcontroller noise as a source of randomness 2025

Course project in microcontrollers and data networks.

- Designed an independent project investigating electrical noise from a microcontroller as a possible source of randomness.
- Collected experimental data and analyzed statistical properties of the generated values.
- Combined low-level programming, hardware interaction, experimental design, and literature review.

Technical skills

Programming	Python, Java, C, C++, C#, JavaScript, Haskell, Rust.
Tools	Git/GitHub, Linux, Neovim, VS Code, \LaTeX .
Research tools	\LaTeX , TikZ/Ipe, algorithm prototyping, experimental validation.

Additional work experience

Crew Member and Shift Leader

Burger King Førde

2021–2025

Førde, Norway

- Led teams during shifts, trained new employees, and handled operational responsibilities in a high-paced environment.

Languages

Norwegian: native. English: fluent.

References

Available upon request.