# Christoph Johannes Jabs

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8th February 2024

## 👤 Current Position

DOCTORAL RESEARCHER at the University of Helsinki Doctoral School in the Doctoral Programme in Computer Science. Developing new algorithmic ideas and theoretical understanding for implementing practical open-source tools for declarative multi-objective optimization. Supervised by *Professor Matti Järvisalo* and *Docent Jeremias Berg* in the Constraint Reasoning and Optimization research group.

## 🎓 Education

### Academic Education

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| **08/2020–06/2022** | MASTER OF SCIENCE in Computer Science, University of Helsinki (Finland), Final grade: 5 (best-possible grade), Thesis grade: 5, graduated the 8th June 2022 |
| **04/2020–08/2020** | Select courses in Computer Science, Eberhard Karls University, Tübingen (Germany) |
| **03/2016–02/2020** | BACHELOR OF ENGINEERING in Mechatronics, Reutlingen University (Germany), Final grade: 1.0 (best-possible grade), Thesis grade: 1.0, graduated the 27th March 2020 |
| **09/2008–06/2015** | HIGH SCHOOL DIPLOMA Karl-von-Frisch Gymnasium, Dusslingen (Germany) Final grade: 1.1 (grading scale from 1.0, 'very good', to 6.0, 'fail') |

### Vocational Education

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| **09/2015–07/2017** | APPRENTICESHIP as a Mechatronic Technician, Robert Bosch GmbH & Ferdinand-von-Steinbeis-Schule, Reutlingen (Germany) |

## 🧰 Professional Experience

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| **05/2021–08/2022** | RESEARCH ASSISTANT at the University of Helsinki (Finland), Constraint Reasoning and Optimization research group<br>• Developed an open-source solver for bi-objective Boolean optimization<br>• Applied incremental MaxSAT solving to bi-objective optimization |
| **10/2019–02/2020** | BACHELOR'S THESIS at Robert Bosch GmbH, Reutlingen (Germany) 'A Recurrent Neural Net Approach to Activity Recognition' |
| **11/2017–06/2020** | STUDENT INTERNSHIP at Robert Bosch GmbH, Reutlingen (Germany)<br>• Planned and implemented software for automation of industrial testing and validation<br>• Planned and executed data collection for mobile theft detection for eBikes<br>• Integrated an open-source Bluetooth stack into a Python testing framework |

## 📖 Publications

### Peer-Reviewed Papers in International Conferences

**2023** (with Jeremias Berg, Hannes Ihalainen and Matti Järvisalo). 'Preprocessing in SAT-Based Multi-Objective Combinatorial Optimization'. In: *29th International Conference on Principles and Practices of Constraint Programming (CP 2023)*. Ed. by Roland. H. C. Yap. Vol. 280. Leibniz International Proceedings in Informatics (LIPIcs). Schloss Dagstuhl — Leibniz-Zentrum für Informatik, 44:1–44:19. DOI: 10.4230/LIPIcs.CP.2023.44.

**2022** (with Jeremias Berg, Andreas Niskanen and Matti Järvisalo). 'MaxSAT-Based Bi-Objective Boolean Optimization'. In: *25th International Conference on Theory and Applications of Satisfiability Testing, SAT*. Ed. by Kuldeep S. Meel and Ofer Strichman. Vol. 236. Leibniz International Proceedings in Informatics, LIPIcs. Schloss Dagstuhl — Leibniz-Zentrum für Informatik, 12:1–12:23. DOI: `10.4230/LIPIcs.SAT.2022.12`.

## Theses

**2022**. 'A Maximum Satisfiability Based Approach to Bi-Objective Boolean Optimization'. M. Sc. thesis. University of Helsinki. URL: `http://urn.fi/URN:NBN:fi:hulib-202206132323`.

**2020**. 'A Recurrent Neural Net Approach to Activity Recognition'. B. Eng. thesis. Reutlingen University.

## Software

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| **BiOptSat** | Open-source solver for boolean bi-objective optimization<br>`https://bitbucket.org/coreo-group/bioptsat/` |
| **RustSAT** | Open-source Rust library with bindings to SAT solvers, SAT encodings, and other utilities<br>`https://github.com/chrjabs/rustsat/` |
| **Scuttle** | Open-source solver for boolean multi-objective optimization<br>`https://bitbucket.org/coreo-group/scuttle/` |

# � International Conference Presentations

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| **08/2023** | 'Preprocessing for SAT-Based Multi-Objective Combinatorial Optimization' at *CP 2023* in Toronto, Canada |
| **08/2022** | 'MaxSAT-Based Bi-Objective Boolean Optimization' at *SAT 2022* in Haifa, Israel |

# ⚒ Professional Skills

## Languages

**German** — Mother tongue

**English** — Effective operational proficiency, TOEFL iBT 114

**French** — Intermediate, DELF B1

**Finnish** — Elementary, A2.1

## Computer Skills

**Operating Systems** — Linux, Microsoft Windows

**Word Processing** — LaTeX, Markup, Microsoft Word, LibreOffice Writer

**Programming Languages** — C/C++, Rust, Python, Bash

# ⚲ Awards, Scholarships, and Grants

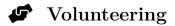| | |
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| **08/2022** | TRAVEL GRANT from the Federated Logic Conference (FLoC) 2022 |
| **02/2019–07/2022** | Highly competitive financial and academic scholarship by the GERMAN ACADEMIC SCHOLARSHIP FOUNDATION for outstanding academic skill and motivation |
| **07/2021** | FRANK GOLTERMANN AWARD for best Bachelor's graduate winter semester 2019/2020 in Mechatronics at Reutlingen University |

# 🏛 Participation in Conferences, Trainings, and Workshops

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| **08/2023** | 29th *International Conference on Principles and Practices of Constraint Programming (CP)* in Toronto, Canada |
| **08/2023** | *Doctoroal Program* of CP 2023 |
| **08/2022** | *Federated Logic Conference (FLoC)* in Haifa, Israel, including the 25th *International Conference on Theory and Applications of Satisfiability Testing (SAT)* |
| **08/2022** | 13th 'Pragmatics of SAT' workshop at *FLoC 2022* in Haifa, Israel |
| **07/2022** | 32nd *European Conference on Operational Research (EURO)* in Espoo, Finland |
| **06/2021** | 'Introduction to Scientific Computing' by *Aalto scientific computing*, online |

## ☞ Volunteering

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| **08/2022** | Student volunteer, *Federated Logic Conference (FLoC) 2022* in Haifa, Israel, including travel grant |
| **2013–2020** | Volunteering youth work, YMCA and Lutheran Church in Germany |