

# Christoph Johannes Jobs

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## Current Position

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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

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### Academic Education

- 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

- 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
- Developed an open-source solver for bi-objective Boolean optimization
  - 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)
- Planned and implemented software for automation of industrial testing and validation
  - Planned and executed data collection for mobile theft detection for eBikes
  - Integrated an open-source Bluetooth stack into a Python testing framework

## Publications

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### Peer-Reviewed Papers in Scientific Journals

2024 (with Jeremias Berg, Andreas Niskanen and Matti Järvisalo). ‘From Single-Objective to Bi-Objective Maximum Satisfiability Solving’. In: *Journal of Artificial Intelligence Research*. accepted.

## Peer-Reviewed Papers in International Conferences

- 2024** (with Jeremias Berg and Matti Järvisalo). ‘Core Boosting in SAT-Based Multi-Objective Optimization’. In: *Integration of Constraint Programming, Artificial Intelligence, and Operations Research—21th International Conference, (CPAIOR 2024)*. Ed. by Bistra Dilkina. Lecture Notes in Computer Science. Springer. accepted.
- 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

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

## International Conference Presentations

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- 05/2024**      ‘Core Boosting in SAT-Based Multi-Objective Optimization’ at *CPAIOR 2024* in Uppsala, Sweden
- 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

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### 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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- 06/2024** SAT/SMT/AR Summer School 2024 in Nancy, France
- 05/2024** 21st International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR) in Uppsala, Sweden
- 08/2023** 29th International Conference on Principles and Practices of Constraint Programming (CP) in Toronto, Canada
- 08/2023** Doctoral 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