

Jeremias Berg

Curriculum Vitae

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Born January 1989, Finland



Degrees

2018 **PhD, Computer Science**, *Faculty of Science*, University of Helsinki.

Thesis

Title *Solving Optimization Problems via Maximum Satisfiability: Encodings and Re-encodings.*

Accepted with distinction on 12.6.2018.

Received the best thesis of 2018 award from the University of Helsinki and the 2020 Doctoral Research Award from the Association for Constraint Programming.

Supervisors Professor Matti Järvisalo & Professor Petri Myllymäki.

Pre-examiners Professor Lakhdar Sais, Université d'Artois, France & Professor Peter Stuckey, University of Melbourne, Australia.

Opponent Professor Inês Lynce, Universidade de Lisboa, Portugal.

2014 **M.Sc., Applied Mathematics**, *Faculty of Science*, University of Helsinki.

Specialized in Logic and Statistical Machine Learning.

An extended (60 cr.) minor in Computer Science.

Post-doctoral Fellowship

9/2021-8/2024 **Academy of Finland Postdoctoral Research Fellow**, *Next-Generation Trustworthy Constraint Optimisation*, Department of Computer Science, University of Helsinki.
A research project funded by the Academy of Finland conducted in the Constraint Reasoning and Optimization Group.

Docentship

2022 **Docent in Computer Science**, *University of Helsinki*.

The title of Docent corresponds roughly to Senior Reader in the UK or Adjunct Professor in the US

Current and Previous Positions

Current **University Lecturer**, Department of Computer Science, University of Helsinki.
50% of time allocated to research.

Current **Academy Postdoctoral Researcher**, *Constraint Reasoning and Optimization Group*, Department of Computer Science, University of Helsinki.
90% of time allocated to research.

- 6/2018-8/2021 **Postdoctoral Researcher**, *Constraint Reasoning and Optimization Group*, Department of Computer Science, University of Helsinki.
- 1/2015-6/2018 **Doctoral Student**, *Constraint Reasoning and Optimization Group*, Department of Computer Science, University of Helsinki.
- 5/2012-12/2014 **Research Assistant**, *Constraint Reasoning and Optimization Group*, Department of Computer Science, University of Helsinki.

Appointments and Board Participation

2020 - 2024 **Member of Young Academy Finland.**

A multidisciplinary organization for young researchers that aims to promote research and strengthen the status of science and scholarship in society.

2021 - **Board member of Finnish Artificial Intelligence Society (FAIS).**

Present FAIS supports and promotes the advancement of public knowledge, education, research and applications of AI in Finland and represents the field of AI internationally as the official member society of the European Association for Artificial Intelligence (EurAI) in Finland.

2020 - **Member of PhD Research Scholarship Selection Committee**, *Nylands Nation*, Present University of Helsinki.

Nylands Nation is a student's club at the University of Helsinki that awards PhD scholarships in the amount of 200 000 euros per year.

In total: two journal publications, 25 conference publications and two workshop publications.

Doctoral Thesis

2018 **Solving Optimization Problems via Maximum Satisfiability: Encodings and Re-Encodings**, *Jeremias Berg*, PhD Thesis, University of Helsinki.

Accepted with distinction on 12.6.2018. Received Awards from both the University of Helsinki and the Association for Constraint Programming.

Papers in Doctoral Thesis

2017 **Cost-Optimal Constrained Correlation Clustering via Weighted Partial Maximum Satisfiability**,

Jeremias Berg and Matti Järvisalo, *Artificial Intelligence*, volume 244, pages 110-142. Elsevier

2016 **Impact of SAT-Based Preprocessing on Core-Guided MaxSAT Solving**, *Jeremias Berg and Matti Järvisalo*, *Proceedings of the 22nd International Conference on Principles and Practice of Constraint Programming (CP)*, volume 9892, pages 66-85 of the *Lecture Notes in Computer Science*.

Springer

2016 **Subsumed Label Elimination for Maximum Satisfiability**,

Jeremias Berg, Paul Saikko and Matti Järvisalo, *Proceedings of the 22nd European Conference on Artificial Intelligence (ECAI)*, volume 285, pages 630-638 of the *Frontiers in Artificial Intelligence and Applications*.

IOS Press

- 2015 **Re-using Auxiliary Variables for MaxSAT Preprocessing**,
Jeremias Berg, Paul Saikko, and Matti Järvisalo, Proceedings of the IEEE 27th International Conference on Tools with Artificial Intelligence (ICTAI), pages 813-820.
 IEEE Computer Society
- 2015 **Improving the Effectiveness of SAT-Based Preprocessing for MaxSAT**,
Jeremias Berg, Paul Saikko, and Matti Järvisalo, Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI), pages 239-245.
 AAAI Press
- 2014 **Learning Optimal Bounded Treewidth Bayesian Networks via Maximum Satisfiability**,
Jeremias Berg, Matti Järvisalo, and Brandon Malone, Proceedings of the 17th International Conference on Artificial Intelligence and Statistics (AISTATS), volume 33, pages 86-95 of the JMLR Workshop and Conference Proceedings.
 JMLR
- [Articles in international scientific journals](#)
- 2018 **Solving Graph Problems via Potential Maximal Cliques: An Experimental Evaluation of the Bouchitté–Todinca Algorithm**,
Tuukka Korhonen, Jeremias Berg, and Matti Järvisalo, Journal of Experimental Algorithmics, volume 24, pages 1-19.
 ACM
- 2017 **Cost-Optimal Constrained Correlation Clustering via Weighted Partial Maximum Satisfiability**,
Jeremias Berg and Matti Järvisalo, Artificial Intelligence, volume 244, pages 110-142.
 Elsevier
- [Contributions to conferences](#)
- 2022 **Clause Redundancy and Preprocessing in Maximum Satisfiability**,
Andreas Niskanen, Jere Mustonen, Jeremias Berg and Matti Järvisalo, Proceedings of the 16th International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR), pages ???? (to appear).
 Springer
- 2022 **Clause Redundancy and Preprocessing in Maximum Satisfiability**,
Hannes Ihalainen, Jeremias Berg and Matti Järvisalo, Proceedings of the 11th International Joint Conference on Automated Reasoning, pages 75–94.
 Springer
- 2022 **MaxSAT-Based Bi-Objective Boolean Optimization**,
Christoph Jabs, Jeremias Berg, Andreas Niskanen and Matti Järvisalo, Proceedings of the 25th International Conference on Theory and Applications of Satisfiability Testing (SAT), pages 12:1-12:23.
 Schloss Dagstuhl - Leibniz-Zentrum für Informatik

- 2022 **Improvements to the Implicit Hitting Set Approach to Pseudo-Boolean Optimization,**
Pavel Smirnov, Jeremias Berg and Matti Järvisalo, Proceedings of the 25th International Conference on Theory and Applications of Satisfiability Testing (SAT), pages 13:1-13:18.
Schloss Dagstuhl - Leibniz-Zentrum für Informatik
- 2022 **Incremental Maximum Satisfiability,**
Andreas Niskanen, Jeremias Berg and Matti Järvisalo, Proceedings of the 25th International Conference on Theory and Applications of Satisfiability Testing (SAT), pages 14:1-14:19.
Schloss Dagstuhl - Leibniz-Zentrum für Informatik
- 2021 **Pseudo-Boolean Optimization by Implicit Hitting Sets,**
Pavel Smirnov, Jeremias Berg and Matti Järvisalo, Proceedings of the 27th International Conference on Principles and Practice of Constraint Programming (CP), pages 51:1-51:19.
Schloss Dagstuhl - Leibniz-Zentrum für Informatik
- 2021 **Enabling Incrementality in the Implicit Hitting Set Approach to MaxSAT Under Changing Weights,**
Andreas Niskanen, Jeremias Berg and Matti Järvisalo, Proceedings of the 27th International Conference on Principles and Practice of Constraint Programming (CP), pages 44:1-44:19.
Schloss Dagstuhl - Leibniz-Zentrum für Informatik
- 2021 **Refined Core Relaxation for Core-Guided MaxSAT Solving,**
Hannes Ihalainen, Jeremias Berg and Matti Järvisalo, Proceedings of the 27th International Conference on Principles and Practice of Constraint Programming (CP), pages 28:1-28:19.
Schloss Dagstuhl - Leibniz-Zentrum für Informatik
- 2020 **Abstract Cores in Implicit Hitting Set MaxSat Solving,**
Jeremias Berg, Fahiem Bacchus and Alex Poole, Proceedings of the 23rd International Conference on Theory and Applications of Satisfiability Testing (SAT), pages 277-294.
Springer
- 2020 **Core-Guided and Core-Boosted Search for CP,**
Graeme Grange, Jeremias Berg, Emir Demirovic and Peter Stuckey., Proceedings of the 17th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR), pages 205-221.
Springer
- 2020 **Preprocessing in Incomplete MaxSAT solving,**
Marcus Leivo, Jeremias Berg, Matti Järvisalo., Proceedings of the 24th European Conference on Artificial Intelligence (ECAI), pages 347-354.
IOS PRESS

- 2019 **Enumerating Potential Maximal Cliques via SAT and ASP**,
Tuukka Korhonen, Jeremias Berg, and Matti Järvisalo, Proceedings of the 28th International Joint Conference on Artificial Intelligence (IJCAI), pages 1116-1122.
 AAAI Press
- 2019 **Core-Boosted Linear Search for Incomplete MaxSAT**,
Jeremias Berg, Emir Demirović, and Peter Stuckey, Proceedings of the 16th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR), volume 11494, pages 39-56 of the Lecture Notes in Computer Science.
 Springer
- 2019 **Unifying Reasoning and Core-Guided Search for Maximum Satisfiability**,
Jeremias Berg and Matti Järvisalo, Proceedings of the 16th Edition of the European Conference on Logics in Artificial Intelligence (JELIA), volume 11468, pages 287-303 of the Lecture Notes in Computer Science.
 Springer
- 2017 **Minimum-Width Confidence Bands via Constraint Optimization**,
Jeremias Berg, Emilia Oikarinen, Matti Järvisalo, and Kai Puolamäki, Proceedings of the 23rd International Conference on Principles and Practice of Constraint Programming (CP), volume 10416, pages 443-459 of the Lecture Notes in Computer Science.
 Springer
- 2017 **Weight-Aware Core Extraction in SAT-Based MaxSAT Solving**,
Jeremias Berg and Matti Järvisalo, Proceedings of the 23rd International Conference on Principles and Practice of Constraint Programming (CP), volume 10416, pages 652-670 of the Lecture Notes in Computer Science.
 Springer
- 2017 **MaxPre: An Extended MaxSAT Preprocessor**,
Tuukka Korhonen, Jeremias Berg, Paul Saikko and Matti Järvisalo, Proceedings of the 20th International Conference on Theory and Applications of Satisfiability Testing (SAT), volume 10416, pages 443-459 of the Lecture Notes in Computer Science.
 Springer
- 2016 **Impact of SAT-Based Preprocessing on Core-Guided MaxSAT Solving**,
Jeremias Berg and Matti Järvisalo, Proceedings of the 22nd International Conference on Principles and Practice of Constraint Programming (CP), volume 9892, pages 66-85 of the Lecture Notes in Computer Science.
 Springer
- 2016 **Subsumed Label Elimination for Maximum Satisfiability**,
Jeremias Berg, Paul Saikko and Matti Järvisalo, Proceedings of the 22nd European Conference on Artificial Intelligence (ECAI), volume 285, pages 630-638 of the Frontiers in Artificial Intelligence and Applications.
 IOS Press

- 2016 **LMHS: A SAT-IP Hybrid MaxSAT Solver**,
Paul Saikko, Jeremias Berg and Matti Järvisalo, Proceedings of the 19th International Conference on Theory and Applications of Satisfiability Testing (SAT), volume 9710, pages 539-546 of the Lecture Notes in Computer Science.
 Springer
- 2015 **Re-using Auxiliary Variables for MaxSAT Preprocessing**,
Jeremias Berg, Paul Saikko, and Matti Järvisalo, Proceedings of the IEEE 27th International Conference on Tools with Artificial Intelligence (ICTAI), pages 813-820.
 IEEE Computer Society
- 2015 **Improving the Effectiveness of SAT-Based Preprocessing for MaxSAT**,
Jeremias Berg, Paul Saikko, and Matti Järvisalo, Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI), pages 239-245.
 AAAI Press
- 2014 **SAT-Based Approaches to Treewidth Computation: An Evaluation**,
Jeremias Berg and Matti Järvisalo, Proceedings of the 2014 IEEE 26th International Conference on Tools with Artificial Intelligence (ICTAI), pages 328-335.
 IEEE Computer Society
- 2014 **Optimal Neighborhood Preserving Visualization by Maximum Satisfiability**,
Kerstin Bunte, Matti Järvisalo, Jeremias Berg, Petri Myllymäki, Jaakko Peltonen, and Samuel Kaski, Proceedings of the 28th AAAI Conference on Artificial Intelligence (AAAI), pages 1694-1700.
 AAAI Press
- 2014 **Learning Optimal Bounded Treewidth Bayesian Networks via Maximum Satisfiability**,
Jeremias Berg, Matti Järvisalo, and Brandon Malone, Proceedings of the 17th International Conference on Artificial Intelligence and Statistics (AISTATS), volume 33, pages 86-95 of the JMLR Workshop and Conference Proceedings.
 JMLR
- Contributions to conference workshops**
Note that these are also peer-reviewed.
- 2015 **Applications of MaxSAT in Data Analysis**,
Jeremias Berg, Antti Hyttinen, and Matti Järvisalo, Proceedings of Pragmatics of SAT (PoS) 2015 and 2018, volume 59, pages 50-64 of the EPiC Series in Computing.
 EasyChair
- 2013 **Optimal Correlation Clustering via MaxSAT**,
Jeremias Berg and Matti Järvisalo, Proceedings of the 2013 IEEE 13th International Conference on Data Mining Workshops (ICDMW), pages 750-757.
 IEEE Computer Society
- Other scientific publications/reports**
- 2022 **MaxSAT Evaluation 2022 : Solver and Benchmark Descriptions**,
Fahiem Bacchus, Jeremias Berg, Matti Järvisalo, Ruben Martins, Andreas Niskanen, Department of Computer Science Report Series B.
 Department of Computer Science, University of Helsinki

- 2021 **MaxSAT Evaluation 2021 : Solver and Benchmark Descriptions**,
Fahiem Bacchus, Jeremias Berg, Matti Järvisalo, Ruben Martins, Department of
 Computer Science Report Series B.
 Department of Computer Science, University of Helsinki
- 2020 **MaxSAT Evaluation 2020 : Solver and Benchmark Descriptions**,
Fahiem Bacchus, Jeremias Berg, Matti Järvisalo, Ruben Martins, Department of
 Computer Science Report Series B.
 Department of Computer Science, University of Helsinki

List of Acquired External Funding

- 2021 Funding Agency: Academy of Finland. Project name: *Next-Generation Trustworthy
 Constraint Optimisation*. Sum: EUR 250 000. main applicant

Other scientific merits/achievements

- 2022 **Invited Talk** *The SAT 2022 conference.*
- 2022 **Local Organizer** *The FoiKS 2022 conference.*
- 2021 **Chair of the Doctoral Program** *The CP 2021 conference.*
- 2021 **Success in the MaxSAT Evaluation** *My MaxSAT solver Loandra took first place in
 the weighted incomplete track of the
 Evaluation*
- 2021 **Invited Talk** *Theoretical Foundations of SAT/SMT Solving workshop of the Simons
 Institute.*
- 2021 **Invited Talk** *Beyond Satisfiability workshop of the Simons Institute.*
- 2020 **Invited Talk** *The course Naturvetenskaper Nu at the University of Helsinki (in Swedish).*
- 2020 **Tutorial** *Advances in Maximum Satisfiability at ECAI.*
- 2020 - **Co-Organizer** *The MaxSAT Evaluations.*
- Present
- 2019 **Success in the MaxSAT Evaluation** *My MaxSAT solver Loandra took first place in
 the unweighted incomplete track of the
 Evaluation*
- 2013 **Local Organizer** *The SAT 2013 conference.*

Reviewing

PC-Member **AAAI 2022, CP 2021-22, CPAIOR 2021-22, SAT 2020-22, AAI 2019-21,
 IJCAI 2019-22, TACAS 2021, IJCAI-DEMOS 2020-21, POS 2020-21**

SPC-Member **IJCAI 2020-2021**

Journals **AIJ, JAIR, JLC, IJA**

Mobility

- 5/2022 **Research visit**, *AI lab, Vrije Universiteit Brussel, Brussels.*
 I visited Professor Bart Bogaerts
- 2-4/2019 **Research visit**, *Department of Computer Science, Faculty of Arts and Science,
 University of Toronto, Canada.*
 I visited Professor Fahiem Bacchus group

10-12/2018 **Research visit**, *School of Computing and Information Systems*,
University of Melbourne, Australia.
I visited Professor Peter Stuckeys group

Distinctions and Awards

- 2020 ACP Doctoral Research Award from the Association for Constraint Programming.
- 2020 Best Paper Award at the SAT 2020 conference.
- 2019 Doctoral dissertation award from the University of Helsinki.
- 2018 Outstanding thesis award from the Doctoral School of Natural Sciences, University of Helsinki.
- 2017 Best Junior Researcher of the year from the Department of Computer Science, University of Helsinki.
- 2017 Award for successful postgraduate studies from the Nokia Foundation.
- 2015 Award for successful postgraduate studies from Emil Aaltonen Foundation.

Teaching Experience

The suggested course load for student at the university level in Finland is 30 ERC per semester, 60 ERC per academic year.

- 2021 **M.Sc. (second cycle) Seminar Course in English**, *Logic-Enabled Verified and Explainable AI*, 5 ECR long course with 4 participants, Department of Computer Science of University of Helsinki.
I gave an introductory lecture, helped the students prepare their presentations, gave them feedback on their presentations and led the discussion after the presentations.
- 2014 - Present **Teaching Assistant in numerous B.Sc. (first cycle) & M.Sc. (second cycle) courses in mathematics and computer science**, *Department of Mathematics and Department of Computer Science of University of Helsinki*, 5 and 10 ERC courses in Finnish, Swedish and English that had everything from 5 to 60 students.
I have been the assistant on 13 different courses in mathematics and computer science. As the assistant my task was to help the students with their exercises, mark the exercises and discuss and give feedback on the students solutions. The courses include basic courses in calculus, linear algebra, algebra, probability, measure theory, Boolean optimization etc.
- 2013 - 2014 **Teaching Assistant for B.Sc. (first cycle) mathematics courses**, *A Project for Complementary Education for Mathematics Teachers*, Four one-term courses (5 ERC each) for a group of 10 teachers, Centre for Lifelong Learning at Åbo Akademi University.
I was the assistant in a project providing complementary education for adults who already work as teachers. My responsibilities included helping them solve exercises and giving them feedback on their solutions.
- 2011 **Lecturer in a B.Sc. (first cycle) Course in Finnish**, *Introduction to discrete mathematics*, 6 ERC with 10 participants, Department of Mathematics and Statistics of University of Helsinki.
I was the principal lecturer of the course and taught it in the so called extreme apprenticeship model. I prepared exercises for the students, helped them solve the exercises. I also prepared and gave lectures for developing the topics encountered during the exercises.

Experience as Supervisor

In total five M.Sc. theses in English and 17 B.Sc. theses in Swedish. All theses completed in one semester. I was the co-supervisor for all M.Sc. theses and the main supervisor for all B.Sc. theses.

- 2022 **Christoph Jabs**, *A Maximum Satisfiability Based Approach to Bi-Objective Boolean Optimization*, M.Sc. thesis (30 ECR), accepted in June 2022 with the grade 5/5.
co-supervisor
- 2022 **Pavel Smirnov**, *Pseudo-Boolean Optimization by Implicit Hitting Sets*, M.Sc. thesis (30 ECR), accepted in March 2022 with the grade 5/5.
co-supervisor
- 2020 **Tuukka Korhonen**, *Finding Optimal Tree Decompositions*, M.Sc. thesis (30 ECR), accepted in June 2020 with the grade 5/5.
co-supervisor
- 2020 **Esa Kemppainen**, *Incomplete MaxSAT Solving by Linear Programming Relaxation and Rounding*, M.Sc. thesis (30 ECR), accepted in June 2020 with the grade 4/5.
co-supervisor
- 2020 **Marcus Leivo**, *Preprocessing and Stochastic Local Search in Maximum Satisfiability*, M.Sc. thesis (30 ECR), accepted in June 2020 with the grade 5/5.
co-supervisor
- 2022 **Jan Rundt**, *Energieffektiva arkitekturer för djupa neuronnät (Energy efficient architectures for deep neural networks)*, B.Sc. thesis (6 ECR), accepted in May 2022 with the grade 5/5.
main supervisor
- 2022 **Anton Taleiko**, *Motverkande av partiskhet i maskininlärningsmodeller (Counteracting bias in machine learning models)*, B.Sc. thesis (6 ECR), accepted in May 2022 with the grade 4/5.
main supervisor
- 2021 **Robert Pakkanen**, *Bildigenkänning med konvolutionella neuronnät (Image recognition with convolutional neural networks)*, B.Sc. thesis (6 ECR), accepted in December 2021 with the grade 4/5.
main supervisor
- 2021 **Thomas Svartbäck**, *Alternativ till "Proof of Work" för kryptovalutor (Alternatives to Proof of Work for cryptocurrencies)*, B.Sc. thesis (6 ECR), accepted in December 2021 with the grade 4/5.
main supervisor
- 2021 **Hugo Holmqvist**, *Behandling av massiva dataströmmar (Computation over large data streams)*, B.Sc. thesis (6 ECR), accepted in December 2021 with the grade 3/5.
main supervisor
- 2020 **Andrea Eriksson**, *Konflikt driven Klausulinläring för SAT-lösning (Conflict-driven clause learning for SAT-solving)*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 5/5.
main supervisor

- 2020 **Saska Dönges**, *Metoder för analys av rekursiva funktioner (Methods for analysing recursive functions)*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 4/5.
main supervisor
- 2020 **Markus Andersson**, *Utveckling och användning av algoritmer som undersöker grafer*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 3/5.
main supervisor
- 2020 **Michael Aminoff**, *Genomgång av stora grafer (The exploration of large graphs)*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 4/5.
main supervisor
- 2020 **Sebastian Segelius**, *Samtidig lokalisering och kartläggning med datorseende (Simultaneous localisation and navigation via computer vision)*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 3/5.
main supervisor
- 2020 **Patrik Henriksson**, *En introduktion till SAFe och dess potentiella fördelar för företag (An introduction to SAFe and its potential benefits for companies)*, B.Sc. thesis (6 ECR), accepted in December 2020 with the grade 3/5.
main supervisor
- 2019 **Philip Ehrnrooth**, *Datasekretess i betalningssystem baserade på blockkedjeteknologi (Security in payment systems based on blockchain)*, B.Sc. thesis (6 ECR), accepted in December 2019 with the grade 5/5.
main supervisor
- 2018 **Maria Ilvonen**, *Mjukvaruutveckling och säkerhet för cyberfysiska system. (Software development and safety of cyberphysical systems)*, B.Sc. thesis (6 ECR), accepted in May 2018 with the grade 5/5.
main supervisor
- 2018 **Max Koppatz**, *Metoder för textklassificering med konvolutionsnätverk (Text classification using convolutional neural networks)*, B.Sc. thesis (6 ECR), accepted in May 2018 with the grade 5/5.
main supervisor
- 2017 **Walter Grönholm**, *Detektion av programinvarianter för automatisk testgeneration. (Using invariants in order to automatically generate software tests)*, B.Sc. thesis (6 ECR), accepted in December 2017 with the grade 3/5.
main supervisor
- 2017 **Miranda Kastemaa**, *Fast Fourier Transform (in Swedish)*, B.Sc. thesis (6 ECR), accepted in December 2017 with the grade 5/5.
main supervisor
- 2015 **Max Sandberg**, *Optimering av spelträdssökning med hjälp av statistiska modeller (The probcut algorithm)*, B.Sc. thesis (6 ECR), accepted in May 2015 with the grade 5/5.
main supervisor

University Pedagogical Education

- 2021 **Course**, *UP 2.2: Assessment of Learning and Giving Feedback (in English)*, Faculty of Science, University of Helsinki.
5 ERC course over one semester
- 2020 **Course**, *UP 2.1: Konstruktivt samordnad undervisning (in Swedish)*, Faculty of Science, University of Helsinki.
5 ERC course over one semester. The english name would be *Constructively Aligned Teaching*
- 2020 **Course**, *YP1: Oppiminen Yliopistossa (in Finnish)*, Faculty of Science, University of Helsinki.
5 ERC course over one semester. The english name would be *Learning in the University*

Other Pedagogical Merits

- 2020- **Member of steering group**, *Uni Junior*, Faculty of Science & Faculty of Pedagogy, University of Helsinki.
Uni Junior is a (Swedish-speaking) cross-disciplinary project aiming to further the science education of children ages 9 to 12 via after-school workshops.
- 2021 **Workshop Organiser**, *Uni Junior*, Faculty of Science & Faculty of Pedagogy, University of Helsinki.
So far I have organized two workshops for Uni Junior. One on the chemistry of color in the autumn 2021 and one of encryption in the spring of 2022
- 2010 **After-hours mathematics club**, *I planned and realized a one semester long weekly club for children ages 7-9 in Swedish*, Kotby Lågstadium, Helsinki.