

LIDING XU

📍 Berlin, Germany

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EMPLOYMENT

Zuse Institute Berlin, Germany

April 2024 - Present

- Postdoc researcher
- Interactive Optimization and Learning Lab, led by Prof. Dr. Sebastian Pokutta (Professor at TU Berlin, Vice President of Zuse Institute Berlin)

LIX CNRS, École Polytechnique, France

September 2020 - December 2023

- PhD in Computer Science: “Relaxation methods for mixed-integer nonlinear programming”
- Supervisors: Prof. Dr. Leo Liberti (CNRS director of research), Prof. Dr. Claudia D’Ambrosio (CNRS director of research), Prof. Dr. Sonia Haddad-Vanier (Professor at École Polytechnique)

EDUCATION

Université Paris-Saclay & Institut Polytechnique de Paris, France

September 2019 -

September 2020

- M2 in Applied Mathematics

École Polytechnique, France

September 2018 - August 2019

- M1 in Computer Science

Peking University, China

September 2014 - June 2018

- Bachelor in Machine Intelligence

RESEARCH INTERESTS

My research focuses on algorithms and theory for mixed-integer nonlinear programming (MINLP), with emphasis on convexification, cutting planes, lifting, decomposition, and applications in networks and quantum information. I also contribute to the development of the MINLP solver SCIP.

PUBLICATIONS

Preprints and Submitted Articles

- Liding Xu, Yechao Liu, and Sebastian Pokutta. 2025. “Convex semidefinite tensor optimization and quantum entanglement.” Submitted to *Mathematical Programming Computation*.
- Liding Xu and Claudia D’Ambrosio. 2025. “A computational framework for continuous edge covering on networks.” Submitted to *INFORMS Journal on Computing*.
- Liding Xu and Leo Liberti. 2024. “Relaxations for binary polynomial optimization via signed certificate.” Under minor revision for *Mathematics of Operations Research*.

Journal Articles

- Liding Xu, Claudia D’Ambrosio, Leo Liberti, and Sonia Haddad-Vanier. 2025. “On Cutting Planes for Signomial Programming.” *SIAM Journal on Optimization*.
- Liding Xu and Leo Liberti. 2024. “Submodular Maximization and its Generalization through Intersection Cuts.” *Mathematical Programming*.
- Liding Xu, Claudia D’Ambrosio, Emiliano Traversi, and Sonia Haddad-Vanier. 2023. “Branch and Price for Submodular Bin Packing.” *EURO Journal on Computational Optimization*.
- Mercedes Pelegrín and Liding Xu. 2023. “Continuous Covering on Networks: Improved Mixed Integer Programming Formulations.” *Omega*.

- Liding Xu and Sonia Haddad-Vanier. 2022. “Branch-and-Price for Energy Optimization in Multi-Hop Wireless Sensor Networks.” *Networks*.

Conference Papers

- Liding Xu, Gioni Mexi, and Ksenia Bestuzheva. 2025. “Sparsity-driven Aggregation of Mixed Integer Programs.” In *Proceedings of the 23rd International Symposium on Experimental Algorithms (SEA 2025)*.

Book Chapters

- Antoine Oustry, Liding Xu, Sonia Haddad-Vanier, Juan-Antonio Cordero, and Thomas Clausen. “Optimization in Wireless Networks.” In *Encyclopedia of Optimization*.
- Liding Xu, Claudia D’Ambrosio, Sonia Haddad-Vanier, and Emiliano Traversi. “Urban Air Mobility.” In *Encyclopedia of Optimization*.

Technical Reports

- Suresh Bolusani *et al.* “The SCIP Optimization Suite 9.0.” In *SCIP Optimization Suite Report*.
- Christopher Hojny *et al.* “The SCIP Optimization Suite 10.0.” In *SCIP Optimization Suite Report*.

PRESENTATIONS AND ATTENDANCE

ICCOPT2025, Los Angeles, USA *July 2025*
Invited talk: Relaxations for Binary Polynomial Optimization via Signed Certificates

EURO2024, Copenhagen, Denmark *July 2024*
Invited Talk: Modelling of piece-wise linear concave constraints in continuous covering problems

43e Journée Francilienne de Recherche Opérationnelle: BinPacking workshop *February 2024*
Talk: Branch and price for submodular bin packing

Oberwolfach Workshop: Mixed-integer Nonlinear Optimization *August 2023*
Attendance

Aussois combinatorial optimization workshop, Aussois, France *January 2023*
Talk: Intersection cut meet submodularity

PGMO2022, Paris, France *November 2022*
Talk: On a concept of a generic intersection cut callback

SCIP2022, Berlin, Germany *November 2022*
Invited Talk: On a concept of a generic intersection cut callback

HUGO2022, Szeged, Hungary *September 2022*
Invited Talk: (Three) cutting planes for signomial programming

EURO2022, Espoo, Finland *July 2022*
Invited Talk: An algorithmic toolkit for continuous set-covering on networks

EURO2021, Athens, Greece *July 2021*
Invited Talk: Optimal location of safety landing sites

ROADEF2021, Mulhouses, France *April 2021*
Talk: Optimal location of safety landing sites

TEACHING

INF569 – Decision theory, with applications to energy systems

École Polytechnique, Palaiseau, France

2022

Master (M1) course – Teaching Assistant (TA)

CSE201 – Object-oriented Programming in C++

École Polytechnique, Palaiseau, France

2022

Bachelor course – Teaching Assistant (TA)

FUNDS AND FELLOWSHIP

Research Campus MODAL funded by the German Federal Ministry of Education and Research (BMBF): 1 year *April 2024 - March 2025*

FX-Conseil - Fondation de l'Ecole Polytechnique (Research Foundation of the Ecole Polytechnique): 6 months *October 2024 - March 2024*

École doctorale IP Paris (French Ministry of Higher Education and Research): 3 years *September 2020 - September 2024*

Labex DigiCosme scholarship for master students: 1 year *September 2018 - August 2019*

SOFTWARE (SELECTED)

SCIP: one of the fastest non-commercial solvers for mixed integer programming (MIP) and mixed integer nonlinear programming (MINLP) (main developer).

TensorOpt4Entanglement: Optimization-based tensor methods for quantum entanglement detection.

cbp: branch-and-price algorithms for conic submodular binpacking.

cflg: an algorithmic toolkit for continuous set covering on networks.

wUMCFC: a solver for wireless unsplittable multi-commodity flow routing with network coding.

SymMIP.jl: symmetry analysis for MIPs.

LANGUAGES

Chinese: Mother Tongue

English: Fluent

French: Beginner