# Xiang Ge (Xiangge) Luo

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## Education

**ETH Zurich** *Basel, Switzerland*

PhD Candidate in Computational Biology *2020.11 - expected 2025.12*

- Thesis: Modelling tumor mutation trees for evolution-guided precision oncology
- Advisor: Prof. Dr. Niko Beerenwinkel | Second advisor: Dr. Jack Kuipers
- Doctoral committee: Prof. Dr. Jasmine Foo, Prof. Dr. Benjamin Raphael

**ETH Zurich** *Zurich, Switzerland*

Master of Science in Statistics *2018.09 - 2020.09*

- GPA: 5.88/6 – Graduated with distinction
- Thesis: Learning Bayesian networks from ordinal data
- Advisor: Dr. Jack Kuipers

**University of Waterloo** *Waterloo, Canada*

Bachelor of Mathematics *2013.09 - 2018.04*

- GPA: 92% – Graduated with distinction, Dean's Honours List

## Research Experience

**Computational Biology Group, ETH Zurich** *Basel, Switzerland*

Scientific Assistant *2020.11 - present*

- Advisor: Prof. Dr. Niko Beerenwinkel
- Developed mathematical and statistical models to infer cancer evolution from cross-sectional single-cell phylogenies, aiming to predict drug resistance and facilitate evolution-guided precision oncology.

**Institute of Molecular Systems Biology, ETH Zurich** *Zurich, Switzerland*

Semester Student *2019.03 - 2019.07*

- Advisor: Prof. Dr. Mattia Zampieri
- Analyzed E. coli drug response metabolomics data to investigate regulatory and functional relationships between metabolites.

**Seminar for Statistics, ETH Zurich** *Zurich, Switzerland*

Statistics Lab Student *2019.03 - 2019.06*

- Advisor: Dr. Markus Kalisch
- Analyzed mouse experimental data using mixed models to assess bone loss and identify early osteoporosis markers.

**Department of Statistics and Actuarial Science, University of Waterloo** *Waterloo, Canada*

Undergraduate Researcher *2017.09 - 2017.12*

- Advisor: Prof. Dr. Alexander Schied
- Derived the Nash equilibrium for risk-averse investors in a market impact game with transient price impact and quadratic transaction costs over finite and infinite horizons.

## Awards & Scholarships

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|---|---|---|
| 2025 | **ISMB/ECCB 2025 Conference Fellowship**, ISCB (USD 500) | *United Kingdom* |
| 2025 | **Robert Gnehm Grant**, ETH Zurich (CHF 750) | *Canada* |
| 2024 | **SIB Remarkable Outputs 2023 Award**, Swiss Institute of Bioinformatics | *Switzerland* |
| 2018 | **Undergraduate Student Research Award**, NSERC (CAD 4,500) | *Canada* |
| 2018 | **President's Research Award**, University of Waterloo (CAD 1,500) | *Canada* |
| 2016 | **President's International Experience Award**, University of Waterloo (CAD 1,500) | *Canada* |
| 2014 | **Isabel Farrar Undergraduate Entrance Scholarship**, University of Waterloo (CAD 4,000) | *Canada* |
| 2014 | **President's Scholarship of Distinction**, University of Waterloo (CAD 2,000) | *Canada* |

## Publications

**Xiang Ge Luo**, Jack Kuipers, Kevin Rupp, Koichi Takahashi and Niko Beerenwinkel. Bayesian inference of fitness landscapes via tree-structured branching processes. *Bioinformatics*, 41:i160-i169, 2025. (**ISMB/ECCB 2025**, acceptance rate 17%)

**Xiang Ge Luo**, Jack Kuipers and Niko Beerenwinkel. Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees. *Nature Communications*, 14:3676, 2023. (**RECOMB 2022**, acceptance rate $21.3\%$)

**Xiang Ge Luo**, Giusi Moffa and Jack Kuipers. Learning Bayesian networks from ordinal data. *Journal of Machine Learning Research*, 22:1-44, 2021.

**Xiangge Luo** and Alexander Schied. Nash equilibrium for risk-averse investors in a market impact game with transient price impact. *Market Microstructure and Liquidity*, 5:2050001, 2020.

## Conferences, Seminars & Workshops

2025.07 **Contributed talk**, ISMB/ECCB 2025 Conference *Liverpool, UK*
- Bayesian inference of fitness landscapes via tree-structured branching processes

2025.04 **Poster**, 6th Zurich Precision Oncology Symposium *Zurich, Switzerland*
- FiTree: fitness inference from single-cell phylogenies applied to acute myeloid leukemia data

2025.03 **Invited talk**, D-BSSE Departmental Seminar Series, ETH Zurich *Basel, Switzerland*
- Fitness inference from single-cell phylogenies using tree-structured branching processes

2025.02 **Contributed talk**, PhyloBasel Seminar Series, ETH Zurich *Basel, Switzerland*
- Bayesian inference of fitness landscapes via tree-structured branching processes

2024.06 **Award talk**, SIB Days – The Swiss Bioinformatics Summit *Virtual*
- Mining tumor mutation trees with TreeMHN for evolution-guided precision oncology

2023.06 **Contributed talk**, SKINTEGRITY.CH Annual Retreat *Spiez, Switzerland*
- Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees

2022.06 **Contributed talk**, Mutual Hazard Networks Workshop *Virtual*
- Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees

2022.05 **Contributed talk**, RECOMB 2022 Conference *San Diego, USA*
- Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees

2022.04 **Contributed talk**, OLISSIPO Exchange Week *Lisbon, Portugal*
- Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees

2022.03 **Poster**, Ascona Workshop 2022 *Ascona, Switzerland*
- Joint inference of exclusivity patterns and recurrent trajectories from tumor mutation trees

2021.06 **Invited talk**, Royal Bank of Canada Machine Learning Seminar *Virtual*
- Nash Equilibrium for Risk-Averse Investors in a Market Impact Game with Transient Price Impact

## Teaching

Spring 2023 **Teaching Assistant**, Statistical Models in Computational Biology *ETH Zurich*
Spring 2022 **Head Teaching Assistant**, Statistical Models in Computational Biology *ETH Zurich*
Spring 2022 **Teaching Assistant**, LSZGS Advanced Block Course Computational Biology *ETH Zurich*
Spring 2021 **Teaching Assistant**, Statistical Models in Computational Biology *ETH Zurich*

## Supervision

2023 **Laura Quintas**, Master Student, INESC-ID (Co-supervised with Monica Baciu-Dragan)
2023 **Laurenz Keller**, Master Student, ETH Zurich (Co-supervised with Pawel Piotr Czyz)
2022 **Jiayi Wang**, Master Student, ETH Zurich (Co-supervised with Pawel Piotr Czyz)

## Academic Services

**Journal Reviewer** for Genome Research, Bioinformatics **Conference Reviewer** for RECOMB, ISMB

## Languages and Skills

**Coding** Python, R, C++, MATLAB, Git, Snakemake, bash, LaTeX
**Languages** English (working proficiency), Mandarin (native), Cantonese (native)