# VITTORIO ZAMPINETTI

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## ACADEMIC EXPERIENCE

**Ph.D. student** 2021 - October 2025
*Applied Math and Computational Biology* *Politecnico di Torino, Italy*

- Summary: My research involves the definition and analysis of Bayesian inference ML algorithms such as Variational Inference, as well as maximum likelihood methods (EM), which enable the reconstruction of cancer evolutionary trees from high-dimensional and inherently noisy sequencing data. Additionally, I develop efficient methods for sampling trees and generate synthetic data for testing implementations before the application on real data.
- Co-tutelle PhD programme with KTH, Stockholm, under the supervision of Jens Lagergren.
- During summer 2023, I have been a visiting researcher at Memorial Sloan Kettering Cancer Center in New York, in Sohrab Shah lab, working on analysis of whole-genome sequencing data.

**MSc** 2019 - 2021
*Data Science and Engineering* *Politecnico di Torino, Italy*

- Scolarship as part of the ASP excellence programme.
- One-year Erasmus programme at KTH in Stockholm.
- Master thesis on copy-number aware clonal tree reconstruction using single cell RNA sequence.

**BSc** 2016 - 2019
*Computer Engineering* *Università di Firenze, Italy*

- Thesis on the development of an automated tool for cell measurement in 3D images acquired by confocal light sheet microscopy.

## ARTICLES

**Main author, Statistics and Probability Letters** June 2025
*Accepted article* *Journal article*

- Summary: Method for sampling directed spanning trees from graphs representing a probability distribution over trees.

**Main author, RECOMB 2024** April 2024
*Accepted article, Oral Presentation* *Conference at MIT Boston*

- Summary: The paper presents the first Bayesian framework for joint inference of copy number evolution and clonal trees.
- Coordinate Ascent VI (CAVI) and Importance sampling based framework.
- Introduces a novel sampler for labeled directed trees named LARS.

## TEACHING

**Politecnico di Torino, Italy** 2021 - 2024
Main Teaching Assistant (TA) in Statistical Models.

## TECHNICAL STRENGTHS

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|---|---|
| **Programming Languages** | Python, C/C++, Java, R, Javascript, Matlab |
| **Languages** | Italian (fluent), English (fluent), Swedish (basic) |
| **Tools/libraries** | LaTeX, PyTorch, TensorFlow, JAX, Pyro, NetworkX, MPI, Spark, Docker, AWS, Unix, Vim, Git, HPC clusters |