Francesco Pontiggia

University Assistant **iD** (Last update: March 2025)

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RESEARCH INTERESTS

Probabilistic Model Checking | Probabilistic Programming | Formal Languages | Probabilistic Hyperproperties

EDUCATION

Doctoral programme Logics in Computer Science | TU Wien (AT)   July 2022 - ongoing
Topic: *Verification and Synthesis of Probabilistic Programs.*
Supervisor: Prof. Dr. Ezio Bartocci. Co-supervisors: Dr. Michele Chiari and Prof. Dr. Laura Kovács.

Research Visit | RWTH Aachen (DE)   Nov. 2023 - Jan. 2024
MOVES group headed by Prof. Dr. Joost-Pieter Katoen.

***MSc* Degree, Computer Science and Engineering** | Politecnico di Milano (IT)   2021
Final Grade: 110/110 *cum Laude.*

Erasmus+ Study Program | Universiteit Utrecht (NL)   Sept. 2019 - Jan. 2020
Department of Information and Computing Science. GPA: 8.0/10.

***BSc* Degree, Engineering of Computing Systems** | Politecnico di Milano (IT)   2018
Final Grade: 106/110.

EXPERIENCE

University Assistant | TU Wien (AT)   July 2022 - currently
Trustworthy Cyber-Physical Systems Research Group.

Project Assistant | TU Wien (AT)   Nov. 2021 - June 2022
Probabilistic Invariant Generation (ProbInG) Lab.

ACADEMIC SERVICE & GRADUATE ACTIVITY

Artifact Evaluation Committee: CAV'24, FM'24.
Reviewer: SAC-SVT'25, FM'23, TACAS'23, QEST'23, QEST'22.

Summer Schools:

- Advanced Functional Programming Summer School, Universiteit Utrecht (NL), 2021.
- Probability in Computer Science Ph.D. School, ETAPS, Copenhagen (DK), 2024.

Collaborations: prof. Dr. Milan Češka, Brno University of Technology (CZ). Visited in Nov. 2024.

Teaching: Tutor for Advanced Functional Programming (TU Wien), SS22, SS23, SS24, SS25.

Software Projects

POPACheck | *CORPORA Lab*   2023 - ongoing
An extension of POMC for probabilistic programs with recursion, conditioning and nested queries.

HyperPAYNT/PHSynth | *ProbInG Lab*   2022 - ongoing
Two tools for synthesizing controllers for Markov Decision Processes against probabilistic hyperproperties.

POMC | *Master Thesis*   2020 - 2021
A model checker for procedural Java-like programs with exceptions.

Peer- Reviewed Publications

- POPACheck: a Model Checker for probabilistic Pushdown Automata
  Francesco Pontiggia, Ezio Bartocci, Michele Chiari
  International International Conference on Computer Aided Verification (CAV), 2025.

- Decentralized Planning Using Probabilistic Hyperproperties
  Francesco Pontiggia, Filip Macák, Roman Andriushchenko, Michele Chiari, and Milan Češka
  International Conference on Autonomous Agents and Multiagent Systems(AAMAS), 2025.

- A Model Checker for Operator Precedence Languages.
  Michele Chiari, Dino Mandrioli, Francesco Pontiggia, Matteo Pradella
  ACM Transactions on Programming Languages and Systems(TOPLAS), 2023.

- Deductive Controller Synthesis for Probabilistic Hyperproperties.
  Roman Andriushchenko, Ezio Bartocci, Milan Češka, Francesco Pontiggia, Sarah Sallinger
  International Conference on Quantitative Evaluation of Systems(QEST), 2023.

- Verification of Programs with Exceptions Through Operator Precedence Automata.
  Francesco Pontiggia, Michele Chiari, Matteo Pradella
  International Conference on Software Engineering and Formal Methods(SEFM), 2021.

Other scientific works

- Exact Inference for Nested Discrete Probabilistic Programs
  Francesco Pontiggia, Ezio Bartocci, Michele Chiari
  Languages for Inference Workshop(LAFI, colocated with POPL), 2025.

Skills & Certificates

Programming Languages: Haskell, C/C++, Python, Java, R, SQL.

Frameworks: The LLVM Compiler Infrastructure and Clang Frontend, The Protégé Ontology Framework, JAVA Akka and the Actor model, SparkJava and REST paradigm.

NVIDIA DLI Certificate – Fundamentals of Accelerated Computing with CUDA C/C++, 2020.