

Thomas Pani

»Tackling complex problems with deep understanding, creativity and excellent communication.«

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EXPERIENCE

INFORMAL SYSTEMS Research Engineer

2/2022 – Present | Vienna, AT

TU WIEN and WOLFGANG PAULI INSTITUTE

Scientific Research and Teaching Assistant

2/2014 – 8/2021 | Vienna, AT

- Developed an automated safety and termination verifier for parameterized programs [2]. Implemented in **Eldarica** (Scala).
- Designed an automated time complexity analysis for shared-memory concurrent / parameterized programs [3]. Impl.: **Coachman** (OCaml).
- Co-created **VeriFolio** [4], a machine learning-based portfolio software verification algorithm (Python, Shell).
- Developed **Kripke Builder**, an interactive frontend for manipulating kripke structures and evaluating temporal logic formulae (Angular, JS, HTML).
- Taught and assisted courses on programming languages, formal methods, computer-aided verification, and information design.

GOOGLE RESEARCH / GOOGLE CLOUD PhD SWE Intern

5/2019 – 8/2019 | Mountain View, CA, USA

5/2018 – 8/2018 | Mountain View, CA, USA

- Contributed to an internal Python library for authoring, executing, and testing complex machine-learning pipelines.
- Authored a pipeline for large-scale on-device evaluations for one of Google's mobile ML models (Java, Python, Shell).
- Developed a tool for systematic inconsistency detection in machine health data using formal methods (C++, Z3 SMT solver, Google-internal frameworks: Bigtable, Dremel, Flume, Protobufs, RecordIO).
- Reviewed C++ and Python code and design documents.

TU WIEN Project Assistant & Undergrad Teaching Assistant

10/2009 – 1/2014 | Vienna, AT

- Created **Sloopy**, a Clang-based tool for predicting empirical hardness of automated program analyses (C++).
- Teaching assistant for OOP. Designed and supervised exercise groups.

AWARDS

2018, 2017 FMCAD conference best student contribution (2 succ. years)
2014 Faculty's award for best Master's thesis
2009–2011 TU Wien academic excellence scholarship (3 succ. years)

SELECTED PUBLICATIONS

- [1] T. Pani. 'Thread-Modular Verification of Parameterized Programs'. PhD thesis. TU Wien, Oct. 2021.
- [2] T. Pani et al. 'Thread-Modular Counter Abstraction for Parameterized Program Safety'. In: *FMCAD*. IEEE, 2020.
- [3] T. Pani et al. 'Rely-Guarantee Reasoning for Automated Bound Analysis of Lock-Free Algorithms'. In: *FMCAD*. IEEE, 2018.
- [4] Y. Demyanova et al. 'Empirical Software Metrics for Benchmarking of Verification Tools'. In: *CAV*. Springer, 2015.

FURTHER EXPERIENCE

VIENNA SCIENCE BALL

Organizing committee member

2015–Present | Vienna, AT

Website & online ticket sales.

AUSTRIAN RED CROSS

Volunteer

2012–2018 | Vienna, AT

Tutor for socially disadvantaged children and teenagers.

VIENNA SUMMER OF LOGIC

Co-organizer

2014 | Vienna, AT

Helped organize the largest conference in the history of logic.

NURSING SCHOOL TULLN

Teacher

2011–2014 | Tulln, AT

Taught computer science, data processing, and statistics.

EDUCATION

TU WIEN

Dr.techn. in Computer Science

12/2021 | Vienna, AT

Dipl.-Ing. in Computer Science

1/2014 | Vienna, AT

BSc in Computer Science

10/2010 | Vienna, AT

INTERESTS

Improving software quality

Concurrency

Science communication

Cooking

Tai Chi

SKILLS

Languages

German (native)

English (fluent)

Spanish (basic)

Programming

C, C++, C#, Java, JS, OCaml, PHP,

Python, Scala, Shell · CSS, SQL,

XML (proficient)

Assembly, Eiffel, Haskell, Perl,

Ruby, Smalltalk (familiar)