

Thomas Pani



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

thpani.net | thomas.pani@gmail.com | +43 680 3047150

EXPERIENCE

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 | PhD SWE Intern, Machine Perception

5/2019 – 8/2019 | 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).
- Reviewed Python code and design documents.

GOOGLE CLOUD | PhD SWE Intern, Data Center Software

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

- 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++ code and design documents.

TU WIEN | Project Assistant & Undergrad Teaching Assistant

10/2009 – 1/2014 | Vienna, AT

- Created **Sloopy** [5], 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, July 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.
- [5] T. Pani. 'Loop Patterns in C Programs'. MA thesis. TU Wien, Jan. 2014.

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 |

Local co-organizer

2014 | Vienna, AT

Helped organize the largest conference in the history of logic.

NURSING SCHOOL TULLN |

Teacher

2011–2014 | Tulln, AT

Tought computer science, data processing, and statistics.

EDUCATION

TU WIEN

Dr.techn. in Computer Science

11/2021 (expected) | 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)