

Stefano Pessotto

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Research interests

Automata theory, Transducer theory, Logics, Temporal logics, Theory of computation, Complexity theory, Finite model theory, Game theory

Education

2021 – Present **University of Udine** – Udine, Italy

MSc in Computer Science, minor in Algorithms and Automated Reasoning

Thesis: "From the equivalence problem for transducers to Hilbert's basis theorem"

Supervisors: Prof. Gabriele Puppis and Prof. Luca Geatti (*Weighted mean: 29.286, one exam missing*)

In this thesis we investigate the equivalence problem for various classes of finite-state register transducers and discuss in detail an open complexity problem for the equivalence of copyless streaming string transducers, along with known lower and upper bounds.

Relevant coursework

- *Advanced algorithms*: Pattern matching algorithms, Randomized algorithms, Kolmogorov Complexity
- *Automatic system verification: theory and applications*: Labelled transition systems, Büchi automata, Temporal logics, Verification and validation of reactive systems, Model checking, Symbolic model checking, Bounded model checking, Applications to AI and Cybersecurity
- *Complexity and information theory*: Main results on time and space complexity theory, Data compression, Kolmogorov complexity
- *Languages and compilers*: Functional programming, Top down and bottom up parsers, Attribute grammar, SDD L-attributed and S-attributed, Three address code, Optimizations and error recovery
- *Logic for applications*: Relational algebra, Relational calculus, Finite model theory, Game theory, Descriptive complexity theory

- 2017 – 2021 **University of Udine** – Udine, Italy
 BSc in Computer Science
 Thesis: "Discretizzazione e analisi automatica di modelli di crescita tumorale"
 Supervisors: Prof. Carla Piazza (*Weighted mean: 26.482, Final Grade: 105/110*)
 Sapo is a tool for the analysis of discrete-time polynomial dynamical systems, capable of computing reachability and parameter synthesis. The aim of the thesis is to implement a set of well-known growth models in Sapo and compare results against tumor growth data.
- 2012 – 2017 **Istituto Tecnico Industriale "Città della Vittoria"** – Vittorio Veneto, Italy
 High school leaving qualification in "Informatica e telecomunicazioni"

Publications

- 2021 **Speeding up Answer Set Programming by Quantum Computing**
 Romanello R., Della Giustina D., Pessotto S., Piazza C.
QUASAR 2024 - Proceedings of the ACM Workshop on Quantum Search and Information Retrieval, Part of: HPDC 2024 - 33rd International Symposium on High-Performance Parallel and Distributed Computing.

Research experience

- March 2025 – Present **University of Udine**
 Mentors: Prof. Luca Geatti (University of Udine)
 Study of the Safety and Liveness fragments in the finite setting and its impact on model checking. This resulted in a paper that has now been accepted for publication in TIME 2025.

Teaching experience

- 2024 **Web Security Tutor for CyberChallenge.IT (University of Udine)**
 Laboratory activities teaching web security.
- 2023 **Web Security Tutor for CyberChallenge.IT (University of Udine)**
 Laboratory activities teaching web security.

2022 **Web Security Tutor for CyberChallenge.IT (University of Udine)**
Laboratory activities teaching web security.

Industry experience

April 2018 – **Structura Technology & Innovation s.r.l. (Firmware developer)** – Vittorio
October 2019 Veneto, Italy
Firmware development for embedded systems and testing activities.

July 2017 – **I.R.C.A. S.p.A. - Zoppas Industries Heating Element Technologies (Intern)** –
September 2017 Vittorio Veneto, Italy
Development of system architecture for an embedded system and mock up, testing activities and training on firmware development and APQP.

September 2016 **Techocad S.R.L. (Intern)** – Vittorio Veneto, Italy
Computer assembly and laptop repairs.

June 2016 **G2G Communities CIC (Intern)** – Rhyl, Wales
Teaching activities and development of new learning resources.

Talks and tutorials

November 2024 Recognizing Safety and Liveness
Coursework seminar on the Safety and Liveness fragments of LTL.

June 2024 Introduction to Web Security
Presentation on the fundamentals of web security at University of Udine.

December 2023 HighSchools CTF Workshop
Presentation on web security for the HighSchools workshop @ Udine. Author of 6 introductory web-challenges.

January 2022 Teorema di Fagin
Coursework presentation on Fagin theorem.

Other activities

- 2024 Organizer of SnakeCTF Finals 2024
Author of 1 unsolved web security challenge, co-author of 1 real-world interacting challenge, co-author of 1 challenge written during the event and event organizer.
- 2024 Organizer of SnakeCTF Quals 2024
Author of 2 web security challenges and event organizer.
- 2023 Organizer of SnakeCTF 2023
Author of 4 web security challenges, co-author of 1 real-world interacting web challenge and event organizer.
- 2022 - present Member of a Quality Assurance Commission in the University of Udine
- 2020 - present Member of MadrHacks
Member of the academic cybersecurity team MadrHacks (University of Udine).
- 2016 Erasmus+ VET-PRISE 2015
Scholarship in the project of Erasmus+ VET-PRISE for the year 2015-2016.

Technical skills

Programming languages

Proficient in: Python, C, PHP, Java, Haskell, SQL, Javascript

Familiar with: C++, Julia , . . .

Software

L^AT_EX, Git, Linux, Proxmox, . . .

Languages

Italian (mother tongue), English (fluent)

Other interests

Interest in the Linux community, homelab enthusiast