

Vittorio Cipriani – Curriculum Vitae

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Personal Information

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PLACE OF BIRTH: Macerata (MC), Italy

NATIONALITY: Italian

Current Position

Research fellow at the Institut für Diskrete Mathematik und Geometrie of Technische Universität Wien (TU Wien) where I am a project assistant of the project “Classifying structures via Learning” led by Prof. Ekaterina Fokina.

Education

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| 05/23 | <i>PhD in Computer Science, Mathematics and Physics, University of Udine, Italy</i>
Dissertation title: “Many problems, different frameworks: classification of problems from computable analysis to algorithmic learning theory”. Supervised by Alberto Marcone and Luca San Mauro |
| 09/19 | <i>MSc in Computer Science, University of Camerino, Italy (last year at TU Wien)</i>
Dissertation title: “Algorithmic Learning of Computable Structures”. Supervised by Ekaterina Fokina, Luca San Mauro and Carlo Toffalori. Grade: 110 with distinction out of 110 |
| 07/17 | <i>BSc in Computer Science, University of Camerino, Italy</i>
Dissertation title: “Towards a Workbench for Topological Data Analysis”. Supervised by Emanuela Merelli.
Grade: 110 with distinction out of 110 |

Research Interests

KEYWORDS: Computable analysis, Weihrauch reducibility, computability theory, algorithmic learning theory, computable structure theory, descriptive set theory.

Publications and ongoing research

- [1] Calculating the Mind Change Complexity of Learning Algebraic Structures (with Nikolay Bazhenov and Luca San Mauro). In: Berger, U., Franklin, J.N.Y., Manea, F., Pauly, A. (eds) *Revolutions and Revelations in Computability*. CiE 2022. Lecture Notes in Computer Science, vol 13359. Springer, Cham. https://doi.org/10.1007/978-3-031-08740-0_1;

- [2] Learning algebraic structures with the help of Borel equivalence relations (with Nikolay Bazhenov and Luca San Mauro). In *Theoretical Computer Science*, 951:113762, 2023. Available at <https://arxiv.org/abs/2110.14512>;
- [3] The Weihrauch lattice at the level of Π_1^1 -CA₀: the Cantor-Bendixson theorem (with Alberto Marcone and Manlio Valenti). In *The Journal of Symbolic Logic*, published online 2025:1-39. doi:10.1017/jsl.2024.72. Available at <https://arxiv.org/abs/2210.15556>;
- [4] The complexity of finding supergraphs (with Arno Pauly), In: Della Vedova, G., Dundua, B., Lempp, S., Manea, F. (eds) *Unity of Logic and Computation. CiE 2023. Lecture Notes in Computer Science*, vol 13967. Springer, Cham. https://doi.org/10.1007/978-3-031-36978-0_15.
- [5] Embeddability of graphs and Weihrauch degrees (with Arno Pauly), *submitted for publication*. Available at <https://arxiv.org/abs/2305.00935>;
- [6] Classifying different criteria for learning algebraic structures (with Nikolay Bazhenov, Sanjay Jain, Luca San Mauro and Frank Stephan), *submitted for publication*. Available at <https://arxiv.org/abs/2410.22933>;
- [7] On the learning power of Friedman-Stanley jumps (with Alberto Marcone and Luca San Mauro), *submitted for publication*. Available at <https://www.arxiv.org/pdf/2501.12846>;
- [8] On statistical learning of graphs (with Valentino Delle rose, Luca San Mauro and Giovanni Soldà), *submitted for publication*;
- [9] Hyperarithmetic Aspects of Unfriendly Partitions of Recursive Graphs (with David Belanger, Jun Le Goh, Linus Richter, Frank Stephan, and Haoyun Tang) *in preparation*.

Selected Talks

INVITED TALKS

- 07/24 “On the computational complexity of unfriendly partitions”
Computability and Complexity in Analysis Swansea University (UK)
- 07/24 “Characterizing learnability for families of structures”
AMS-UMI International Joint Meeting (Computability Theory special session), University of Palermo (Italy)
- 03/24 “Classifying isomorphism problems and learning of algebraic structures”
UW Logic Seminar (online), University of Wisconsin-Madison (USA)
- 10/21 “Cantor-Bendixson Theorem in the Weihrauch lattice”
Midwest Computability Seminars (online), University of Wisconsin-Madison (USA)

CONTRIBUTED TALKS

19 contributed talks given at international meetings, including several editions of Logic Colloquium, Computability in Europe, Computability and Complexity in Analysis, Computability, Complexity and Randomness and Continuity, Computability and Constructivity.

INVITED PARTICIPATIONS

03/22 “New directions in computability theory” at CIRM, Luminy (France)

Research Visits

05/24 National University of Singapore (3 weeks)

04/24 University of Bari (3 weeks)

12/22 Swansea University (3 months)

Events

07/24 (Co-organizer) “Computable structure theory and interactions” (TU Wien)

01/23 (Staff member) “UNESCO World Logic Day” (University of Udine)

07/21 (Co-organizer) “Equivalences, Numberings, Reducibilities”, a satellite event of the 8th european congress of mathematics, University of Udine (online)

Teaching Experience

21-22 Teaching assistant for Linear Algebra (BSc in Computer Science, University of Udine)

Awards and Grants

22-24 Association for Symbolic Logic Travel Grant for: Logic Colloquium 2022, 2024 and Computability, Complexity and Randomness 2023

04/18 Merit Prize from the association “Pozzo di Miele” for MSc students

Services to the field

CURRENT MEMBERSHIPS

Associazione Italiana di Logica e sue Applicazioni (AILA), Computability in Europe and American Mathematical Society.

REVIEWER

Journals: Theoretical Computer Science, Journal of Symbolic Logic.

Languages

ITALIAN (mother tongue), ENGLISH (fluent spoken and written) GERMAN (basic).