

Matteo Vaccargiu, Ph.D.

Research Assistant, University of Hohenheim Stuttgart, Germany

Empirical Software Engineering • Developer Sustainability • Socio-technical Systems

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Vaccargiu



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London SmartBridge Lab



Matteo



Employment History

06/2026 – Present

Research Assistant, Chair of Information Systems and Digital Technologies, University of Hohenheim, Stuttgart, Germany.

Conducts empirical research on behavioural and coordination aspects of software development, programming language ecosystems, and AI agents in software engineering. Applies mining software repositories, data mining, statistical modelling, and machine learning methods.

2024 – Present

Research Member, SmartBridge Lab, London.

Conducts research in *Empirical Software Engineering*, investigating how technical, human, and socio-economic factors interact within software projects conceived as complex socio-technical systems. Applies data mining, machine learning, and time series analysis to software repositories.

2022 – 2026

University Tutor, University of Cagliari.

Courses taught:

Quantitative Methods (International Management Degree, 01/09/2025–Present);

Informatica 2 (Mathematics Degree, 01/10/2024–Present);

Statistica (Mathematics Degree, 01/10/2023–28/02/2025);

Statistica applicata alle scienze naturali (Natural Sciences Degree, 01/10/2023–28/02/2024);

Laboratorio Matematico Statistico (Mathematics Degree, 01/03/2022–Present).

2022 – 2025

High School Teacher.

Teaching experience in several institutions:

Liceo Classico “G.M. Dettori”, Cagliari (27/05/2025–11/06/2025);

Liceo Scientifico “A. Pacinotti”, Cagliari (29/03/2025–16/05/2025);

Liceo Classico-Scientifico “Euclide”, Selargius (10/10/2024–22/12/2024);

Summer School “Python Campus al Parco”, Sardegna Ricerche & University of Cagliari (04/09/2023–07/09/2023);

Liceo Scientifico “Antonio Pacinotti”, Cagliari – Curvatura Informatica (01/02/2022–10/06/2022).

2022 – 2023

Field Hockey Instructor, FIH Hockey Academy.

Instructor in multiple official FIH coaching courses conducted with Thomas Tichelman:

Level 2 Coaching Course, Bra (21/06/2022–24/06/2022);

Level 1 Coaching Course, Rome (06/10/2022–08/10/2022);

Level 2 Coaching Course, Cagliari (07/09/2023–10/09/2023).

Education

- 2022 – 2026  **Ph.D. in Blockchain and Distributed Ledger Technology**, Curriculum in Climate, Energy, and Mobility, University of Camerino, Italy.
Degree awarded on 23 June 2026.
Thesis: *Blockchain Oriented Software Engineering for Smart Energy Trading and Decentralized Markets*.
Supervisor: Prof. Roberto Tonelli.
Co-supervisor: Prof. Giuseppe Destefanis.
- 01/10/2025 – 31/10/2025  **Visiting Researcher**, Brunel University London - London Smart Bridge under the supervision of Prof. Romyana Neykova.
- 01/2025 – 04/2025  **EY Bootcamp “Low Carbon Camp”.**
-  **Erasmus+ Project KA171**, University of Tirana (Blended Mobility).
- 01/2024 – 05/2024  **Visiting Researcher**, Brunel University London - London Smart Bridge under the supervision of Prof. Giuseppe Destefanis.
- 12/09/2023 – 15/09/2023  **4th Scientific School on Blockchain & Distributed Ledger Technologies**, University of Cagliari.
- 12/12/2023 – 16/12/2023  **3rd International Online Winter School on Blockchain Technology and Applications (Hyperledger)**, University of Camerino.
- A.Y. 2022/2023  **Master I Level in Trans-Skills for Health and Wellness**, Pegaso University. 1500 hours (60 CFU).
- 23/09/2022  **Master’s Degree in Applied Mathematics (LM-40)**, University of Cagliari. Thesis: *“Direct Effect between Treatment and Outcome with Mediator and Confounding Factors.”* Tutor: Prof. Silvia Columbu. Final grade: 110/110 cum laude.
- 01/04/2022 – 15/06/2022  **Internship**, Laboratoire de Biostatistiques, University of Strasbourg. Tutor: Prof. Erik Sauleau.
- 01/2022 – 06/2022  **Erasmus+ Project**, Université de Strasbourg.
Courses: *Statistiques avec R*, *Statistiques avec SAS*, *Séries Temporelles*, and *Théorie des sondages*.
- 18/09/2020  **Bachelor’s Degree in Mathematical Sciences (L-35)**, University of Cagliari. Thesis: *“Elliptic Curves on Finite Fields and Applications to Cryptography.”* Tutor: Prof. Andrea Loi. Final grade: 104/110.
- 09/2019 – 06/2020  **Erasmus+ Project**, Universidad de Cádiz.
Courses: Various mathematics-related courses.
- 2012 – 2017  **High School Diploma in Surveying**, I.I.S. Bacaredda–Atzeni, Cagliari.
Focus on Construction, Environment, and Territory. Final grade: 100/100.

Research Publications

Journal Articles

- 1 M. Vaccargiu, S. Aufiero, S. Bartolucci, R. Neykova, R. Tonelli, and G. Destefanis, "Developer engagement in open-source software's green transition," *Communications Sustainability*, vol. 1, p. 41, Mar. 2026.  DOI: 10.1038/s44458-026-00050-w.
- 2 M. Vaccargiu, S. Bartolucci, N. Novielli, M. Ortu, R. Tonelli, and G. Destefanis, "Emotional expression in open- source: How project function shapes communication," *Information and Software Technology*, vol. 191, p. 108 003, 2026, ISSN: 0950-5849.  DOI: <https://doi.org/10.1016/j.infsof.2025.108003>.
- 3 A. Bigiotti, L. Mostarda, A. Navarra, A. Pinna, R. Tonelli, and M. Vaccargiu, "Smart listeners: A hybrid-optimistic inter-blockchain communication protocol," *Blockchain: Research and Applications*, p. 100 339, 2025, ISSN: 2096-7209.  DOI: <https://doi.org/10.1016/j.bcr.2025.100339>.
- 4 A. Bigiotti, L. Mostarda, A. Navarra, *et al.*, "Blockchain agnostic protocols: An analysis of the state of the art," *ACM Comput. Surv.*, vol. 58, no. 2, Sep. 2025, ISSN: 0360-0300.  DOI: 10.1145/3758089.
- 5 M. Vaccargiu and R. Tonelli, "Blockchain projects in environmental sector: Theoretical and practical analysis," *Earth*, vol. 5, no. 3, pp. 354–370, 2024, ISSN: 2673-4834.  DOI: 10.3390/earth5030020.
- 6 M. Vaccargiu, A. Pinna, R. Tonelli, and L. Cocco, "Blockchain in the energy sector for sdg achievement," *Sustainability*, vol. 15, no. 20, 2023, ISSN: 2071-1050.  DOI: 10.3390/su152014843.

Conference Proceedings

- 1 S. Aufiero, M. Vaccargiu, S. Bartolucci, F. Caccioli, and G. Destefanis, "Coordination at scale in large distributed development: The case of kubernetes," in *Proceedings of the 23rd International Conference on Mining Software Repositories*, ser. MSR '26, Rio de Janeiro, Brazil: Association for Computing Machinery, 2026.  DOI: 10.1145/3793302.3793342.
- 2 M. Vaccargiu, S. Aufiero, S. Bartolucci, R. de Souza Santos, R. Tonelli, and G. Destefanis, "Efficiency for experts, visibility for newcomers: A case study of label-code alignment in kubernetes," in *Proceedings of the International Conference on Evaluation and Assessment in Software Engineering*, ser. EASE '26, Glasgow, United Kingdom: Association for Computing Machinery, 2026.  DOI: 10.1145/3816483.3816514.
- 3 M. Vaccargiu, R. Lai, M. I. Lunesu, A. Pinna, and G. Destefanis, "Patterns of bot participation and emotional influence in open source development," in *Proceedings of the 2026 7th International Workshop on Bots and Agents in Software Engineering*, ser. BoatSE '26, Association for Computing Machinery, 2026, pp. 1–7, ISBN: 9798400723933.  DOI: 10.1145/3786161.3788455.
- 4 M. Vaccargiu, A. Ullah, and P. Gallo, "A blockchain-oriented software engineering architecture for carbon credit certification systems," in *2026 9th International Workshop on Blockchain Oriented Software Engineering (IWBOSE)*, 2026. arXiv: 2601.13772 [cs.SE].  URL: <https://arxiv.org/abs/2601.13772>.
- 5 S. Giuffrida, S. Salim, A. Ullah, and M. Vaccargiu, "A move sui library for secure, certified and trusted supply chain ownership management," in *2025 IEEE/ACM 7th International Workshop on Emerging Trends in Software Engineering for Blockchain (WETSEB)*, 2025, pp. 50–56.  DOI: 10.1109/WETSEB66605.2025.00013.
- 6 E. Marku, M. Vaccargiu, M. C. Di Guardo, and G. Destefanis, "Is blockchain the new hive mind? collective intelligence in decentralized open-source communities," in *Academy of Management Proceedings*, Academy of Management Valhalla, NY 10595, vol. 2025, 2025, p. 18 207.
- 7 M. Vaccargiu, S. Aufiero, C. Ba, *et al.*, "Mining a decade of event impacts on contributor dynamics in ethereum: A longitudinal study," in *2025 IEEE/ACM 22nd International Conference on Mining Software Repositories (MSR)*, 2025, pp. 552–563.  DOI: 10.1109/MSR66628.2025.00088.

- 8 M. Vaccargiu, R. Neykova, N. Novielli, M. Ortu, and G. Destefanis, "More than code: Technical and emotional dynamics in solidity's development," in *2025 IEEE/ACM 18th International Conference on Cooperative and Human Aspects of Software Engineering (CHASE)*, 2025, pp. 260–271.  DOI: 10.1109/CHASE66643.2025.00036.
- 9 M. Vaccargiu, E. Khina, and R. Tonelli, "Block-timer: A layer-optimized approach for bpmn process execution with time constraints on blockchain," in *Proceedings of the 7th Distributed Ledger Technology Workshop (DLT 2025)*, Pizzo, Italy, Jun. 2025, pp. 12–14.  URL: <https://ceur-ws.org/Vol-4105/paper06.pdf>.
- 10 A. Bigiotti, L. Mostarda, A. Navarra, A. Pinna, R. Tonelli, and M. Vaccargiu, "Interoperability between evm-based blockchains," in *Advanced Information Networking and Applications*, L. Barolli, Ed., Cham: Springer Nature Switzerland, 2024, pp. 98–109, ISBN: 978-3-031-57853-3.
- 11 M. Vaccargiu, S. Aufiero, S. Bartolucci, R. Neykova, R. Tonelli, and G. Destefanis, "Sustainability in blockchain development: A bert-based analysis of ethereum developer discussions," in *Proceedings of the 28th International Conference on Evaluation and Assessment in Software Engineering*, ser. EASE '24, Salerno, Italy: Association for Computing Machinery, 2024, pp. 381–386, ISBN: 9798400717017.  DOI: 10.1145/3661167.3661194.
- 12 M. Vaccargiu, G. Ibba, and A. Pinna, "Topics analysis and trends on blockchain applications in the energy sector," in *2024 IEEE International Conference on Software Analysis, Evolution and Reengineering - Companion (SANER-C)*, 2024, pp. 68–71.  DOI: 10.1109/SANER-C62648.2024.00014.
- 13 M. Vaccargiu, G. Ibba, and R. Tonelli, "Is it possible to develop a decentralized free energy market? an automatic literature review approach," in *6th Distributed Ledger Technologies Workshop (DLT2024)*, Turin, Italy, May 2024, pp. 14–15.  URL: <https://ceur-ws.org/Vol-3791/paper31.pdf>.
- 14 M. Vaccargiu and R. Tonelli, "An ethereum oracle-based solution for p2p energy trading market," in *2024 IEEE International Conferences on Internet of Things (iThings) and IEEE Green Computing & Communications (GreenCom) and IEEE Cyber, Physical & Social Computing (CPSCom) and IEEE Smart Data (SmartData) and IEEE Congress on Cybermatics*, 2024, pp. 438–445.  DOI: 10.1109/iThings-GreenCom-CPSCom-SmartData-Cybermatics62450.2024.00086.
- 15 G. Ibba and M. Vaccargiu, "Analysis of users' most discussed topics and trends on blockchain technologies and smart contracts," in *2023 IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER)*, 2023, pp. 865–873.  DOI: 10.1109/SANER56733.2023.00104.

Skills

Languages	 Italian (native); Spanish (fluent); English (B2 certified); French (school level).
Programming	 Python, R, C, SAS, Solidity, Mathematica, $\text{\LaTeX}$.
Data/ML	 PyTorch, TensorFlow.

Miscellaneous Experience

Awards and Achievements

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| 2025 |  MSR 2025 FOSS Award for the paper "Mining a Decade of Event Impacts on Contributor Dynamics in Ethereum: A Longitudinal Study", 22nd International Conference on Mining Software Repositories (MSR 2025). |
| 2024 |  Best Research Paper Award at the Brunel Computer Science PhD Symposium 2024 for the paper "Analyzing Sustainability Discussions among Ethereum Developers: Insights from BERT-Based Topic Modeling." |

Miscellaneous Experience (continued)

- **Peer-to-Peer Voting Winner** at the Brunel Doctoral Poster 2024 for the poster “Do Ethereum Developers Discuss about Sustainability?”

Grants

- 2024 – 2026
- **Principal Investigator**, National Recovery and Resilience Plan (NRRP) Grant, Italian Ministry of University and Research (MUR).
Project: “TraCCCS – Tracciabilità, Certificazione Blockchain e Valorizzazione dei Carbon Credits per PMI Sarde con Impianti di Produzione di Energia Rinnovabile.”
Funding: €65,000. Project Code: ECS0000038 – Spoke 7 eINS, CUP F53C22000430001.
Funded by the European Union–NextGenerationEU.

Other Competences

- **Reviewer.** Peer reviewer for the journals *Blockchain: Research and Applications*, *Computer Communications*, *ACM Transactions on Internet Technology*, and *Information and Software Technology*. Program Committee member at the *4th and 5th International Workshop on Blockchain-Based Architecture (IWBA 2024–2025)*, *7th and 8th International Workshop on Emerging Trends in Software Engineering for Blockchain (IWBOSE 2025–2026)*, *ICSE-SEIS 2026* and *ICSME 2026* Tool Demonstration and Data Showcase Track; Junior PC member at *MSR 2026*.
- **Session Chair.** IEEE Blockchain 2024 and WETSEB 2025.

Thesis Supervision

- 2024 – 2025
- **Co-supervisor.** Bachelor’s Thesis in Applied Computer Science and Data Analytics, University of Cagliari. Student: *Tian Meintjes*. Thesis title: “A Comparison of Ethereum and Sui.”

Other Experience

- **Field Hockey Coach.** Level III certified by the Italian Hockey Federation (FIH); Level II coach recognized by the International Hockey Federation (FIH) and part of the *Coach4Europe* program of the European Hockey Federation (EHF). Technical Director and Coach Coordinator at Polisportiva Ferrini Cagliari Hockey Club. Player in the men’s “Serie A Elite” (highest Italian league) and coach of the women’s “Serie A1” team.
Trainer for Sportways Hockey Camps in Amsterdam (Netherlands).

References

Prof. Roberto Tonelli

Full Professor, Department of Mathematics and Computer Science, University of Cagliari (Italy)

Ph.D. Supervisor

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Dr. Giuseppe Destefanis

Associate Professor, Department of Computer Science, University College London (UK)

Ph.D. Co-supervisor

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