

Alessandro Tundo, Ph.D.

📍 Vienna, Austria ✉ alessandrotundo94@gmail.com 🔗 alessandrotundo.me 🌐 aletundo
 📺 alessandrotundo 🎓 Google Scholar 🆔 0000-0001-8840-8948

Summary

I am a **postdoctoral researcher** and **lecturer** at TU Wien with **5+ years of industry experience as software architect and DevOps engineer**. I received my Ph.D. in Computer Science with honors from the University of Milano-Bicocca in 2024.

My research focused on software engineering and distributed systems, with particular emphasis on the **automation of self-adaptive monitoring systems** (TAAS 2025 pre-print [🔗](#), TSC 2024 [🔗](#), ICSC-C 2024 [🔗](#), TSC 2023 [🔗](#), SEAMS 2022 [🔗](#), ESEC/FSE 2019 [🔗](#)), **fully decentralized edge computing solutions** (TNSM 2025 [🔗](#), PerCom-W 2022 [🔗](#), CloudNet 2021 [🔗](#)), and **energy-aware AI-based applications** (ASE 2023 [🔗](#)).

During my experience, I have used various techniques, including but not limited to feature models, model-driven engineering, multi-objective optimization, rule-based expert systems, and gossip protocols.

I have been involved in (co-)supervision of **15+ bachelor's and master's theses**, and I recently started **co-supervising 3 Ph.D. students**.

Research Experience

University Assistant (Postdoctoral Researcher), TU Wien

Vienna, Austria
June 2024 – present

I am currently focusing on the sustainability dimension of software-intensive systems across the cloud-edge continuum, with a particular emphasis on the optimization of both training and inference of ML-models.

- I belong to the HPC Research Group led by Prof. Ivona Brandic
- Main research areas and outcomes: energy-efficient adaptive fine-tuning of LLMs on resource-constrained devices, split computing and hardware-software co-design optimization ([pre-print](#) [🔗](#)), self-adaptive continual learning, and gossip learning for edge computing workload forecasting ([TNSM 2025](#) [🔗](#))

Visiting Ph.D. Student, TU Wien

Vienna, Austria
Sept 2022 – May 2024

My research focused on energy-aware and self-adaptive AI-based systems for edge computing.

- Supervisor: Prof. Ivona Brandic in collaboration with Prof. Ezio Bartocci
- Main outcome of the visiting period published as [full research paper](#) [🔗](#) at the 38th IEEE/ACM International Conference on Automated Software Engineering (ASE)
- Collaborated in the extension of DEMon, and fully decentralized monitoring framework for volatile edge environments ([TAAS 2025 pre-print](#) [🔗](#))

Ph.D. Candidate, University of Milano-Bicocca

Milan, Italy
Nov 2020 – May 2024

My research focused on the automation and self-adaptation of monitoring systems for the cloud continuum. The thesis contains the results of two full research papers ([SEAMS 2022](#) [🔗](#), [ASE 2023](#) [🔗](#)) and two journal articles ([TSC 2023](#) [🔗](#), [TSC 2024](#) [🔗](#)).

- Supervisor: Prof. Leonardo Mariani
- Thesis available at: <https://hdl.handle.net/10281/476763> [🔗](#)
- Explored related research areas, such as, model-driven dashboard generation ([SESos 2024](#) [🔗](#)), fully decentralized edge computing ([PerCom-W 2022](#) [🔗](#), [CloudNet 2021](#) [🔗](#)), monitoring probe reconfigurability and adaptability ([ICSC-C 2024](#) [🔗](#)).

Research Assistant, University of Milano-Bicocca

Milan, Italy
Jan 2019 – Oct 2020

My research focused on application monitoring ([ESEC/FSE 2019](#) [🔗](#), [ISSRE-W 2020](#) [🔗](#)), anomaly detection ([ISSRE-W 2019](#) [🔗](#), [ICMLA 2021](#) [🔗](#)), and self-healing in cloud systems.

- Supervisor: Prof. Leonardo Mariani

- Research carried out in the context of the "Learning from Failing and Passing Executions at the Speed of Internet" (LEARN) project and the "Governing Adaptive Unplanned Systems of Systems" (GAUSS) project

Junior Researcher, *University of Milano-Bicocca*

Collaborated in the scope of a EU funded 5G-PPP Phase 2 project ([NGPaaS](#)), a project jointly developed by telco industry leaders (i.e., Nokia, Orange, BT) and universities (i.e., DTU, University of Milano-Bicocca, Ghent University).

- Supervisor: Prof. Leonardo Mariani
- Contributed to design and integration of a solution for Monitoring-as-a-Service (later became the VARYS framework) in a 5G-ready PaaS for the telco industry
- Participated to other research activities about anomaly detection and self-healing for the CORD platform (cloud-native platform for telco services) ([EuCNC 2019](#))
- Attended two plenary project meetings (Paris and Heraklion) and participated in writing project deliverables and research publications

Milan, Italy

Mar 2018 – Jan 2019

Research Scholarship Holder, *Consortium GARR*

Design and development of cloud-native architectures for Open Educational Resources (OER) and their integration with Learning Management Systems (LMS).

- Supervisor: Prof. Daniela Micucci (University of Milano-Bicocca) and GARR Scientific and Technical Committee
- Nominated by Consortium GARR for the "GÉANT's Future Talent Program" (Lighting Talk competition)
- Delivered talks at GARR events (Borsisti Day 2017, Borsisti Day 2018, Workshop GARR 2018) and participated to training courses on public speaking

Milan, Italy

Jan 2017 – Dec 2018

Industry Experience

Software Architect & DevOps Engineer, *Arcan*

- Led cloud and on-premises architecture design for [Arcan](#), an automated tool for financial software quality assessment
- Implemented DevOps practices, including CI/CD pipelines with GitHub Actions, deployment strategies, and configuration management to streamline production operations

Milan, Italy

May 2022 – Dec 2023

Software Architect, *2Program*

- Designed and advised on cloud-based software services tailored to customer-specific needs, leveraging Digital Ocean PaaS solutions and Laravel ecosystem
- Integrated cloud services seamlessly into customer systems to enhance functionality and scalability (e.g., SendGrid, Stripe, Edenred API)

Milan, Italy

Jan 2021 – Apr 2022

DevOps Engineer, *Quisque*

- Integrated Prometheus and Grafana across the whole technological stack deployed on Google Kubernetes Engine (GKE)
- Optimized GKE resource utilization in a multi-cluster setup reducing by 30% the monthly operational cost
- Conducted R&D to integrate DevOps methodologies into the development of a Mobility-as-a-Service platform for parking and e-charging services

Milan, Italy

Feb 2020 – Nov 2020

Full-stack Developer, *2Program*

- Developed web applications and CMS platforms for clients in food, retail, and fashion industries using Laravel framework and Digital Ocean infrastructure

Milan, Italy

Jan 2015 – Feb 2017

Education

Ph.D. *University of Milano-Bicocca*, Computer Science

- Grade: excellent with honors
- Thesis: "Adapt and Automate: Efficiently Monitoring in the Cloud Continuum" (Available at: <https://hdl.handle.net/10281/476763>)

Milan, Italy

Nov 2020 – May 2024

- Advisor: Prof. Leonardo Mariani

M.Sc. University of Milano-Bicocca, Computer Science

Milan, Italy

Oct 2016 – Oct 2018

- Grade: 110/110 with honors
- Thesis: "Model-driven Monitoring-as-a-Service in a Next Generation Platform-as-a-Service (NGPaaS)"
- Advisor: Prof. Leonardo Mariani; Co-advisors: Dr. Oliviero Riganelli & Dr. Marco Mobilio

B.Sc. University of Milano-Bicocca, Computer Science

Milan, Italy

Oct 2013 – Oct 2016

- Grade: 110/110 with honors
- Thesis: "EasyLink: Annotazione Semantica in WikiToLearn"
- Advisor: Prof. Matteo Palmonari; Co-advisors: Dr. Elisabetta Fersini

Teaching

I have been involved in teaching activities at the University of Milano-Bicocca (Italy) since my master's degree, and I am **currently lecturer at TU Wien (Austria)**. I have held various roles, including **laboratory assistant**, **tutor**, **tutor** for students with **specific learning disabilities (SLD)**, and **lecturer** in undergraduate and master's degree courses.

In addition to lectures and laboratory exercises, I have been responsible for developing teaching materials and exercises, providing support and feedback both in live sessions and through online platforms (e.g. Moodle), and evaluating students' exercises and written and oral exams.

TU Wien:

- **Data-Intensive Computing** (M.Sc. Data Science) [A.Y. 24-25]
- **AI/ML in the Era of Climate Change** (M.Sc. Data Science) [A.Y. 24-25]

University of Milano-Bicocca:

- **Software Development Process** (M.Sc. Computer Science) [A.Y. 19-20, 20-21, 21-22, 22-23, 23-24, 24-25]
- **Cloud Computing** (M.Sc. Computer Science) [A.Y. 19-20, 20-21, 21-22]
- **Data Management & Visualization** (M.Sc. Data Science) [A.Y. 19-20]
- **Computer Science Laboratory I** (B.Sc. Physics) [A.Y. 19-20]
- **Distributed Systems** (B.Sc. Computer Science) [A.Y. 17-18, 19-20]

Mentoring and Supervision

In 2016 and 2017 I mentored on behalf of the KDE Community at the **Google Summer of Code (GSoC)** for two projects related to WikiToLearn, an open-source project for collaborative textbook writing that I was involved in at that time.

During my academic career, I have actively participated in (co-)supervision of **2 bachelor's theses**, of which one resulted in a workshop paper; and **12 master's theses**, of which three resulted in conference papers, at both the University of Milano-Bicocca (Italy) and TU Wien (Austria).

At the moment, I am involved in the co-supervision of **3 Ph.D. students and 6 master's students** at TU Wien (Austria). A list of students and their thesis titles is available on [my personal website](#) [↗](#).

During my Ph.D. studies at the University of Milano-Bicocca (Italy), I also served as a **student representative** for my cohort and the entire department.

Academic Services

Organizing Committee

- 8th International Workshop on Context-Aware, Autonomous and Smart Architectures (CASA) [co-located with ECSA 2025]
- 1st International Workshop on Systems and Methods for Sustainable Large-Scale AI (GreenSys) [co-located with EuroSys 2025]

Program Committee

- International Web Information Systems Engineering Conference (WISE) 2025 [Main Track]
- Fast Continuum Workshop 2025 [co-located with IEEE World Congress on SERVICES]
- IEEE International Symposium on Cluster, Cloud, and Internet Computing (CCGrid) 2025 [Artifact Evaluation Track]

- IEEE/ACM International Conference on Software Engineering (ICSE) 2025 [Artifact Evaluation Track]
- International Web Information Systems Engineering Conference (WISE) 2024 [Main Track, PhD Symposium]

Journal Reviewer

- ACM Transactions on Software Engineering and Methodology (TOSEM)
- Elsevier Information and Software Technology (IST)
- Springer Automated Software Engineering (ASE)
- Springer Design Automation for Embedded Systems (DAES)

External Reviewer

- IEEE International Parallel & Distributed Processing Symposium (IPDPS) 2025
- IEEE International Conference on Cloud Computing (CLOUD) 2024
- IEEE International Conference on Edge Computing & Communications (EDGE) 2024

Training

MSCA Postdoctoral Fellowships 2024 - Basics on the Application: Formal Criteria and Proposal Writing Aspects 2024

3 hours webinar offered by the department for Funding Support and Industry Relations of TU Wien.

Essentials in National Research Funding 2024

12 hours course offered by the department for Funding Support and Industry Relations of TU Wien.

16th Symposium and Summer School On Service-Oriented Computing 2022

SummerSoC is a well-established summer school and symposium focusing on service-oriented computing. I attended the summer school and presented a poster about my ongoing doctoral research.

27th Bertinoro International Spring School (BISS) 2022

One week spring school organized by Italian Computer Science PhD granting institutions under the auspices of GRIN, offering three graduate-level courses aimed at PhD students in Computer Science.

Cloud Management with Docker and Kubernetes 2019

8 hours course offered by Consortium GARR and University of Milano-Bicocca.

Public Speaking Course 2018

Multiple online sessions over 2 months with Barbara Rogoski (TEDx Ambassador for Europe) in the context of the GÉANT's Future Talent Programme.

Techniques and Training about Public Speaking 2018

16 hours course offered by Consortium GARR, manager of the Italian National Research and Education Network.

Cloud Management with OpenStack and Juju 2018

8 hours course offered by Consortium GARR and University of Milano-Bicocca.

Honors and Awards

Best Short Paper Award 2024

"Towards Model-Driven Dashboard Generation for Systems-of-Systems", 12th IEEE/ACM International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems.

Hackathon winner (People's choice prize) 2019

Winner team (People's choice prize) @ HackTheCloud 2019: Developed a cloud-native application to enable and increase farm-to-table products through a certified and monitored supply chain.

Hackathon winner (2nd prize) 2018

Winner team (2nd prize) @ HackTheCloud 2018: Developed a cloud-native application to implement a car sharing companies aggregator with car pooling functionality.

Research Scholarship 2017 – 2018

I twice received the "O. Carlini" research scholarship, funded by the Consortium GARR, the Italian National Computer Network for Universities and Research (NREN).





Hackathon winner 2017












Winner team @ Hack.Developers 2017: Developed a microservice to ingest data from Km4City/Replicate Smart City platform into the Data Analytics Framework (DAF).

Talks and Presentations

Invited talk	May 2025
"Adapt to Sustain: Leveraging Self-Adaptivity for Sustainable Software Systems" @ <i>Muse Research Lab (IMDEA Software Institute), Madrid (Spain) [online]</i>	
Conference presentation	June 2024
"ReProbe: An Architecture for Reconfigurable and Adaptive Probes" @ <i>ICSA 2024, Hyderabad (India)</i>	
Guest lecture	Nov 2023
Guest lecture for the course "AI/ML in the Era of Climate Change" @ <i>TU Wien, Vienna (Austria)</i>	
Conference presentation	Sept 2023
"An Energy-Aware Approach to Design Self-Adaptive AI-based Applications on the Edge" @ <i>ASE 2023, Luxembourg City (Luxembourg)</i>	
Conference presentation	May 2022
"Towards Self-Adaptive Peer-To-Peer Monitoring for Fog Environments" @ <i>SEAMS 2022, Pittsburgh (USA) [online]</i>	
Conference presentation	Nov 2021
"DFaaS: Decentralized Function-as-a-Service for Federated Edge Computing" @ <i>CloudNet 2021, Cookeville (USA) [online]</i>	
Conference presentation	Oct 2020
"Declarative Dashboard Generation" @ <i>GAUSS workshop (co-located with ISSRE 2020), Coimbra (Portugal) [online]</i>	
Conference presentation	Aug 2019
"VARYS - A Technology Agnostic Model-Driven Monitoring-as-a-Service Framework for the Cloud" @ <i>ESEC/FSE 2019, Estonia (Tallinn)</i>	
Invited talk	May 2018
"Automazione e monitoring: la cultura DevOps attraverso due casi di studio" @ <i>GARR Workshop 2018, Rome (Italy)</i>	

Publications

Decentralized Edge Workload Forecasting With Gossip Learning	2025
Alessandro Tundo, Federica Filippini, Federico Regonesi, Michele Ciavotta, Marco Savi <i>IEEE Transactions on Network and Service Management</i> 10.1109/TNSM.2025.3570450 	
A Decentralized and Self-Adaptive Approach for Monitoring Volatile Edge Environments	2025
Shashikant Ilager, Jakob Fahringer, Alessandro Tundo, Ivona Brandic <i>ACM Transactions of Autonomous and Adaptive Systems (accepted, to appear)</i> 10.48550/arXiv.2405.07806 	
Monitoring Probe Deployment Patterns for Cloud-Native Applications: Definition and Empirical Assessment	2024
Alessandro Tundo, Marco Mobilio, Oliviero Riganelli, Leonardo Mariani <i>IEEE Transactions on Services Computing</i> 10.1109/TSC.2024.3349648 	
ReProbe: An Architecture for Reconfigurable and Adaptive Probes	2024
Federico Alessi, Alessandro Tundo, Marco Mobilio, Oliviero Riganelli, Leonardo Mariani <i>21st IEEE International Conference on Software Architecture (ICSA-C 2024)</i> 10.1109/ICSA-C63560.2024.00037 	
Towards Model-Driven Dashboard Generation for Systems-of-Systems	2024
Maria Teresa Rossi, Alessandro Tundo, Leonardo Mariani	

- 12th ACM/IEEE International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems (SESoS 2024)
[10.1145/3643655.3643876](#) 
- ExVivoMicroTest: ExVivo Testing of Microservices** 2023
 Luca Gazzola, Maayan Goldstein, Leonardo Mariani, Marco Mobilio, Itai Segall, Alessandro Tundo, Luca Ussi
Journal of Software: Evolution and Process
[10.1002/SMR.2452](#) 
- Automated Probe Life-Cycle Management for Monitoring-As-a-Service** 2023
 Alessandro Tundo, Marco Mobilio, Oliviero Riganelli, Leonardo Mariani
IEEE Transactions on Services Computing
[10.1109/TSC.2022.3180500](#) 
- An Energy-Aware Approach to Design Self-Adaptive AI-based Applications on the Edge** 2023
 Alessandro Tundo, Marco Mobilio, Shashikant Ilager, Ivona Brandic, Ezio Bartocci, Leonardo Mariani
38th IEEE/ACM International Conference on Automated Software Engineering (ASE 2023)
[10.1109/ASE56229.2023.00046](#) 
- Serverless Computing for NFV: Is it Worth it? A Performance Comparison Analysis** 2022
 Marco Savi, Alessandro Banfi, Alessandro Tundo, Michele Ciavotta
IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom 2022 Workshops)
[10.1109/PERCOMWORKSHOPS53856.2022.9767495](#) 
- Towards Self-Adaptive Peer-to-Peer Monitoring for Fog Environments** 2022
 Vera Colombo, Alessandro Tundo, Michele Ciavotta, Leonardo Mariani
International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS 2022)
[10.1145/3524844.3528055](#) 
- DFaaS: Decentralized Function-as-a-Service for Federated Edge Computing** 2021
 Michele Ciavotta, Davide Motterlini, Marco Savi, Alessandro Tundo
10th IEEE International Conference on Cloud Networking (CloudNet 2021)
[10.1109/CLOUDNET53349.2021.9657141](#) 
- Cloud Failure Prediction with Hierarchical Temporal Memory: An Empirical Assessment** 2021
 Oliviero Riganelli, Paolo Saltarel, Alessandro Tundo, Marco Mobilio, Leonardo Mariani
20th IEEE International Conference on Machine Learning and Applications (ICMLA 2021)
[10.1109/ICMLA52953.2021.00130](#) 
- Declarative Dashboard Generation** 2020
 Alessandro Tundo, Chiara Castelnovo, Marco Mobilio, Oliviero Riganelli, Leonardo Mariani
IEEE International Symposium on Software Reliability Engineering Workshops (ISSRE Workshops 2020)
[10.1109/ISSREW51248.2020.00075](#) 
- NGPaaS Framework for Enriched and Customized Virtual Network Functions-as-a-Service** 2019
 Paul Veitch, Adam Broadbent, Angelos Mimidis, Jose Soler, Marco Mobilio, Alessandro Tundo, Michell Guzmàn, Steven Van Rossem
European Conference on Networks and Communications (EuCNC 2019)
[10.1109/EUCNC.2019.8802024](#) 
- Anomaly Detection As-a-Service** 2019
 Marco Mobilio, Matteo Orrù, Oliviero Riganelli, Alessandro Tundo, Leonardo Mariani
IEEE International Symposium on Software Reliability Engineering Workshops (ISSRE Workshops 2019)
[10.1109/ISSREW.2019.00071](#) 
- VARYS: A Technology Agnostic Model-Driven Monitoring-as-a-Service Framework for the Cloud** 2019

Alessandro Tundo, Marco Mobilio, Matteo Orrù, Oliviero Riganelli, Michell Guzmàn, Leonardo Mariani
ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/SIGSOFT FSE 2019)
[10.1145/3338906.3341185](https://doi.org/10.1145/3338906.3341185) 