



Alessandro Tundo

LinkedIn: <https://www.linkedin.com/in/alessandrotundo/>

GitHub: <https://github.com/aletundo> **GitLab:** <https://gitlab.com/aletundo>

Date of birth: 04/01/1994 **Nationality:** Italian

WORK EXPERIENCE

[01/06/2024 – Current] **Post-doctoral Project Assistant**

TU Wien

City: Vienna | **Country:** Austria

[01/02/2024 – 31/05/2024] **Pre-doctoral Project Assistant**

TU Wien

City: Vienna | **Country:** Austria

[02/2018 – Current] **Fixed-term Teaching Assistant (Lab. sessions and tutoring)**

University of Milano-Bicocca

City: Milan | **Country:** Italy

Supplementary educational activities for several B.Sc. and M.Sc. courses, mostly for the Computer Science degree. The activities consist of holding the laboratory session, tutoring students through e-learning platforms, grading the laboratory final projects or assignments.

- Software Development Process (M.Sc. Computer Science) [A.Y. 19-20, 20-21, 21-22, 22-23]
- 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]

[01/2020 – 11/2020] **Research Scholarship Holder**

University of Milano-Bicocca

City: Milano | **Country:** Italy

The research activity entitled aims to extend and enhance the main functionalities of the VARYS framework. VARYS is a technology agnostic model-driven Monitoring-as-a-Service framework for the Cloud. In particular, the main objectives are enabling automatic dashboards generation and anomaly detections. The research work was supervised by Professor Leonardo Mariani.

[01/2020 – 10/2020] **Independent Researcher**

Quisque Srl.

City: Milan | **Country:** Italy

The research objectives involve the development of DevOps practices and frameworks for container-based orchestrators (i.e., Kubernetes) and tailored set of tools for parking remote management through edge devices.

[01/2019 – 01/2020] **Research Fellow (Assegnista di Ricerca)**

University of Milano-Bicocca

City: Milan | **Country:** Italy

The research activity was focused on designing approaches and techniques for application monitoring, anomaly detection and self-healing in Cloud Computing systems.

The research work was carried out first the scope of the LEARN - Learning from Failing and Passing Executions at the Speed of Internet project (8 months) and next for the GAUSS - Governing Adaptive Unplanned Systems of Systems project (4 months). The research work was supervised by Professor Leonardo Mariani. In particular, I worked on:

- an agnostic model-driven Monitoring-as-a-Service framework (VARYS) – an Anomaly Detection as-a-Service tool prototype
- self-healing and repairing approaches for container orchestrators (i.e., Kubernetes)

With respect to VARYS, I also delivered a talk and a tool demo in August 2019 at 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE).

[01/2017 – 12/2018] **Research Scholarship Holder**

Consortium GARR

City: Milan | **Country:** Italy

The research activity involved cloud-native architectures for Open Educational Resources (OER) and integrations into Learning Management Systems (LMS). The research work was supervised by Dr. Daniela Micucci (University of Milano - Bicocca) and by the GARR Scientific and Technical Committee. In particular, I worked on the design and development of a new version of the WikiToLearn platform. WikiToLearn is a wiki-based open source project for collaborative textbooks writing under the KDE Community umbrella, which I was involved in. I also explored DevOps and Automation practices for software development in cloud-native environments. During the research period I had to provide a quarter report about the advancement status, technical issues and the plan for the next quarter. I also had the opportunity to deliver talks at GARR events (Borsisti Day 2017, Borsisti Day 2018, Workshop GARR 2018) and participating to training courses on public speaking. At the end of the first year I was nominated by Consortium GARR for GÉANT's Future Talent Programme (Lighting Talk competition).

[12/2015 – 02/2017] **Full-stack Developer | Freelance**

2Program SRL

City: Milan | **Country:** Italy

Design and development of web applications and CMS from scratch.

- Requirements analysis and UML modelling
- Database schema design
- Full-stack development
- CI/CD pipelines design

[08/2015 – 07/2016] **Waiter | Freelance**

Fatto Bene SRL

City: Milan | **Country:** Italy

EDUCATION AND TRAINING

[10/2020 – 14/05/2024] **PhD in Computer Science**

University of Milano-Bicocca

Country: Italy | **Field(s) of study:** Information and Communication Technologies | **Final grade:** Cum Laude | **Thesis:** Adapt and Automate: Efficiently Monitoring in the Cloud Continuum

[09/2022 – 31/01/2024] **Visiting PhD Student**

TU Wien

Country: Austria |

[07/03/2022 – 11/03/2022] **Bertinoro International Spring School (BISS)**

Italian Computer Science PhD granting institutions

Country: Italy | **Field(s) of study:** Information and Communication Technologies

[2019] **Cloud Management with Docker and Kubernetes [8 hours]**

Consortium GARR

Country: Italy | **Field(s) of study:** Information and Communication Technologies

The holder of this Badge has acquired knowledge on *Cloud Computing* and the service models related to it (Infrastructure as a Service, Platform as a Service, Software as a Service), as well as skills related to the use of components of a *Cloud Computing* infrastructure and to *Service Deployment and Management* in a Cloud environment.

[2016 – 2018] **MSc in Computer science**

University of Milano-Bicocca

Country: Italy | **Field(s) of study:** Information and Communication Technologies | **Final grade:** with honors

During my master's degree thesis (supervised by Professor Leonardo Mariani), I started collaborating in the scope of a European funded 5G-PPP Phase 2 Project named NGPaaS - Next Generation Platform-as-a-Service. NGPaaS was a project jointly developed by telco industry leaders (i.e., Nokia, Orange, BT) and universities (i.e., DTU, University of Milano - Bicocca).

Specifically, I contributed to design and integrate a solution for Monitoring-as-a-Service (lately became the VARYS framework) in a 5G-ready Cloud PaaS for the telco industry (NGPaaS). Moreover, I also participated to other activities in the scope of anomaly detection and self-healing for the CORD platform (cloud-native platform for telco services).

During the collaboration period, I had the opportunity to work with several telco industry researcher and professors, some of them have been co-authors of the paper "NGPaaS Framework for Enriched and Customized Virtual Network Functions-as-a-Service".

I also attended two project meetings (Paris and Heraklion) and participated in writing project deliverables and research publications. An extensive list of the project outcomes is available at <http://ngpaas.eu/projectoutcomes/>.

[2018] **Public Speaking Course [multiple online sessions over 2 months]**

GÉANT's Future Talent Programme - Barbara Rogoski (TEDx Ambassador for Europe)

Field(s) of study: Education

[2018] **Cloud Management with OpenStack and Juju [8 hours]**

Consortium GARR

Country: Italy | **Field(s) of study:** Information and Communication Technologies

The holder of this Badge has acquired knowledge on Cloud Computing, the models of services related to it (Infrastructure as a Service, Platform as a Service, Software as a Service) and the deployment models (Juju), as well as skills related to the use of components of a Cloud Computing infrastructure and Service Deployment and Management in a Cloud environment.

[2018] **Techniques and Training about Public Speaking [16 hours]**

Consortium GARR

Country: Italy | **Field(s) of study:** Education

[2013 – 2016] **BSc in Computer science**

University of Milano-Bicocca

Country: Italy | **Field(s) of study:** Information and Communication Technologies | **Final grade:** with honors

Thesis on semantic annotation and disambiguation for wiki platforms.

[2005 – 2013]

High-school graduation diploma

I.I.S.S. Ettore Majorana

Country: Italy | | Final grade: 100/100

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING B2 READING C1 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Spanish






LISTENING A2 READING A2 WRITING A2

SPOKEN PRODUCTION A2 SPOKEN INTERACTION A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Digital Skills - Test Results

	Information and data literacy	ADVANCED	Level 6 / 6
	Communication and collaboration	ADVANCED	Level 6 / 6
	Digital content creation	ADVANCED	Level 6 / 6
	Safety	ADVANCED	Level 6 / 6
	Problem solving	ADVANCED	Level 6 / 6

Results from [self-assessment](#) based on [The Digital Competence Framework 2.1](#)

COMMUNICATION AND INTERPERSONAL SKILLS

Team work

I have worked in various types of teams in the research and development area. From September 2022 I'm part of the HPC Group @ TU Wien, a team of more than 15 people working on a diverse range of topics. We have regular sub-teams and full team meetings every two weeks. From 2016 to 2019 I have been part of WikiToLearn, an open source project under the KDE Community umbrella.

Intercultural skills

I am experienced at working in multicultural environment. Currently, my team is composed by people from seven different countries across the globe. In addition, thanks to open source projects I have to deal with people of different nationalities, mostly from Europe, USA and India.

ORGANISATIONAL SKILLS

Mentoring

I mentored for KDE Community for the Google Summer of Code 2016 and 2017. During the 2017 edition I attended to Google Summer of Code Mentor Summit @ Google Tech Corners in Sunnyvale, California. I had to assess the work and guide the student I mentored.

MANAGEMENT AND LEADERSHIP SKILLS

Community management

In 2016 I founded a Linux User Group at my university with other classmates. In 2017 we started to deliver workshops and talks for the community.

BSc and MSc thesis supervision

I co-supervised more than 10 BSc and MSc computer science thesis.

Relevant topics:

- Automatic dashboard generation for cloud monitoring
- Self-adaptive fog monitoring
- Federated edge computation

DRIVING LICENCE

Cars: B

HONOURS AND AWARDS

- [14/04/2024] **Best Short-Paper Award Awarding institution:** 12th International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems
Paper Title: Towards Model-Driven Dashboard Generation for Systems-of-Systems
Authors: Maria Teresa Rossi, Alessandro Tundo, Leonardo Mariani
- [2019] **Winner team (People's choice prize) @ HackTheCloud 2019 Awarding institution:** Consortium GARR and University of Milano-Bicocca
The hackathon was organized by Consortium GARR and the University of Milano - Bicocca. The project consist of a cloud-native application to enable and increase farm-to-table products through a certified and monitored supply chain.
- [2018] **Winner team (2nd prize) @ HackTheCloud 2018 Awarding institution:** Consortium GARR and University of Milano-Bicocca
The hackathon was organized by Consortium GARR and the University of Milano - Bicocca. The project consist of a cloud-native application to implement a car sharing companies aggregator with car pooling functionality.
- [2017] **Winner team @ Hack.Developers 2017 Awarding institution:** AgID & Team Digitale
The hackathon was organized by AgID & Team Digitale, the Italian government team for digital transformation. The project consist of a microservice to ingest data from Km4City/Replicate Smart City platform into the Data Analytics Framework (DAF).

SOCIAL AND POLITICAL ACTIVITIES

- [2020 – 2024] **Member of Associazione Dottorandi e Dottori di Ricerca in Italia (ADI)** Milan, Italy
- [2019 – 2024] **PhD student representative** Milan, Italy

PUBLICATIONS

- [2024] [**Monitoring Probe Deployment Patterns for Cloud-Native Applications: Definition and Empirical Assessment**](#)
Reference: A. Tundo, M. Mobilio, O. Riganelli, L. Mariani
IEEE Transactions on Services Computing (Early Access)
- [2024] **Towards Model-Driven Dashboard Generation for Systems-of-Systems**
Reference: M. T. Rossi, A. Tundo, L. Mariani
Proceedings of the 12th International Workshop on Software Engineering for Systems-of-Systems and Software Ecosystems (SESoS)
- [2023] [**An Energy-Aware Approach to Design Self-Adaptive AI-based Applications on the Edge**](#)
Reference: A. Tundo, M. Mobilio, S. Ilager, I. Brandic, E. Bartocci, L. Mariani
Proceedings of the 38th IEEE/ACM International Conference on Automated Software Engineering (ASE)
- [2023] [**Automated Probe Life-Cycle Management for Monitoring-as-a-Service**](#)
Reference: A. Tundo, M. Mobilio, O. Riganelli, L. Mariani
IEEE Transactions on Services Computing, 16(2): 969-982 (2023)
- [2022] [**Towards Self-Adaptive Peer-To-Peer Monitoring for Fog Environments**](#)
Reference: V. Colombo, A. Tundo, M. Ciavotta, L. Mariani
Proceedings of the 17th Symposium on Software Engineering for Adaptive and Self-Managing Systems, SEAMS 2022. p. 156-166
- [2022] [**ExVivoMicroTest: ExVivo Testing of Microservices**](#)
Reference: L. Gazzola, M. Goldstein, L. Mariani, M. Mobilio, I. Segall, A. Tundo, L. Ussi
Journal of Software: Evolution and Process
- [2022] **Serverless Computing for NFV: Is it Worth it? A Performance Comparison Analysis**
Reference: M. Savi, A. Banfi, A. Tundo, M. Ciavotta
IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)
- [2021] [**DFaaS: Decentralized Function-as-a-Service for Federated Edge Computing**](#)
Reference: M, Ciavotta, D, Motterlini, M, Savi, A, Tundo
IEEE International Conference on Cloud Networking (CloudNet)
- [2021] [**Cloud Failure Prediction with Hierarchical Temporal Memory: An Empirical Assessment**](#)

Reference: O. Riganelli, P. Saltarel, A. Tundo, M. Mobilio, L. Mariani
2021 20th IEEE International Conference on Machine Learning and Applications (ICMLA)

[2020] [Declarative Dashboard Generation](#)

Reference: A. Tundo, C. Castelnovo, M. Mobilio, O. Riganelli, L. Mariani
2020 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)

[2019] [VARYS: an agnostic model-driven monitoring-as-a-service framework for the cloud](#)

Reference: A. Tundo, M. Mobilio, M. Orrù, O. Riganelli, M. Guzmàn, L. Mariani
Proceedings of the 2019 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)

[2019] [Anomaly detection as-a-service](#)

Reference: M. Mobilio, M. Orrù, O. Riganelli, A. Tundo, L. Mariani
2019 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)

[2019] [NGPaaS Framework for Enriched and Customized Virtual Network Functions-as-a-Service](#)

Reference: P. Veitch, A. Broadbent, A. Mimidis, J. Soler, M. Mobilio, A. Tundo, M. Guzmán, S. Van Rossem
2019 European Conference on Networks and Communications (EuCNC)

CONFERENCES AND SEMINARS

[2023] **An Energy-Aware Approach to Design Self-Adaptive AI-based Applications on the Edge**
IEEE/ACM ASE - Luxembourg

[2022] **Towards Self-Adaptive Peer-To-Peer Monitoring for Fog Environments** IEEE/ACM SEAMS - Pittsburgh, USA

[2021] **DFaaS: Decentralized Function-as-a-Service for Federated Edge Computing** IEEE CloudNet - Cookeville, USA

[2020] **Declarative Dashboard Generation** GAUSS Workshop (IEEE ISSRE) - Coimbra, Portugal
Link: <https://drive.google.com/file/d/1azgs8LJGG-BCSzvTcDWtAOSz3fkgfYhU/view>

[2019] **VARYS - a Technology Agnostic Model-Driven Monitoring-as-a-Service Framework for the Cloud**
IEEE/ACM ESEC/FSE - Tallinn, Estonia
Link: https://drive.google.com/file/d/1lqzkI-T2FqHtQiIValhQ0B_IRCS-Ta/view

[2018] **Automazione e monitoring: la cultura DevOps attraverso due casi di studio [Invited Talk]**
Workshop GARR - Rome, Italy
Link: <https://www.eventi.garr.it/it/ws18/programma/workshop/speaker/265-alessandro-tundo>