Michele Tucci

Email : michele.tucci@univaq.it
Skype : tucci.m
Google Scholar
dblp

EDUCATION

University of L'Aquila, L'Aquila, Italy   *May 4, 2021*

PhD in Information and Communication Technology
Thesis advisors : Romina Eramo, Vittorio Cortellessa
Thesis title : "Advanced model-driven techniques to improve non-functional properties of software systems"
Available online : https://tinyurl.com/365w8p99

University of L'Aquila, L'Aquila, Italy   *October 21, 2017*

Master Degree in Computer Science
Thesis advisors : Vittorio Cortellessa, Romina Eramo
Thesis title : "Availability-driven refactoring through bidirectional transformations between UML and Petri Nets"
Mark : 110/110 cum laude

University of L'Aquila, L'Aquila, Italy   *March 27, 2012*

Bachelor Degree in Computer Science
Thesis advisors : Vittorio Cortellessa, Romina Eramo
Thesis title : "Change propagation from performance models to software models through a language for bidirectional transformations"
Mark : 96/110

PROFESSIONAL EXPERIENCE

University of L'Aquila   *since March 2023*
Assistant Professor (RTDa)   *L'Aquila, Italy*

Charles University   *October 2021 - February 2023*
Postdoctoral researcher   *Prague, Czech Republic*

Coordinator : Prof. Petr Tůma
Main activities: Research on performance testing and measurement. I mainly focused on a novel definition of code coverage for performance testing, one that would be compatible with current goals and practices in software engineering. I also worked on the automated detection of performance changes that are relevant to developers, performance benchmarking for parallelism, automated optimization of software architectures for performance, and software refactoring for non-functional properties.

OP RDE project No. CZ.02.2.69/0.0/0.0/18_053/0016976 "International mobility of research, technical and administrative staff at the Charles University"

University of L'Aquila   *2020 - September 2021*
Infrastructure and backend administrator for web services   *L'Aquila, Italy*

Main activities: Responsible for performance, security, and availability of the web services of the University. Administration of the backend from bare metal up to application servers. Design of cloud migration plans.

University of L'Aquila   *2016–2017*
Research project   *L'Aquila, Italy*

Coordinator : Romina Eramo
Title: Development of a framework for bidirectional model transformations in Model-Driven Engineering
Main activities: development of an Eclipse-based IDE for the Janus Transformation Language (JTL).

University of L'Aquila   *2010–2019*
Systems administrator   *L'Aquila, Italy*
Main activities: Administration, integration and analysis of performance, security and availability of systems
on Linux and Windows. Design, installation and administration of a virtual infrastructure based on VMware
vSphere, including hypervisors, virtual storage and centralized management. Implementation of backup and
disaster recovery policies for virtual machines and specific applications. Design of load balancing and high
availability solutions. Implementation of a central monitoring system. The infrastructure hosts more than 300
virtual servers.

University of L'Aquila   *June 2006–2009*
Web developer and web services administrator   *L'Aquila, Italy*
Main activities: Design and development of the web portal of University of L'Aquila using LAMP technology.
Design of a web platform for the web sites of departments and excellence centers. Administration of the
servers hosting the web services for the University.

COMMITTEE AND REVIEWING ACTIVITY

Organizing committee:

- Co-Chair of the Data Challenge track of the International Conference on Performance Engineering
  (ICPE) 2023
- Co-Chair of the International Workshop on Challenges in Performance Methods for Software
  Development (WOSP-C) at ICPE 2023

Committee member:

- Programme Committee of the International Workshop on Load Testing and Benchmarking of Software
  Systems (LTB) 2023
- Artifact Evaluation Committee of the International Conference on Fundamental Approaches to
  Software Engineering (FASE) 2023
- Artifact Evaluation Committee of the European Conference on Object-Oriented Programming
  (ECOOP) 2023
- Programme Committee of the International Workshop on Challenges in Performance Methods for
  Software Development (WOSP-C) at ICPE 2022
- Artifact Evaluation Committee of the
  International Conference on Software Language Engineering (SLE) [2018,2019,2020,2021,2022]
- Programme Committee of the International Workshop on Model-Driven Engineering for
  Design-Runtime Interaction in Complex Systems (MDE@DeRun), co-located with MODELS [2021]
- Programme Committee of the International Workshop on Modeling Language Engineering and
  Execution (MLE), co-located with MODELS [2021]

Reviewer for the journals:

- Journal of System and Software (JSS)
- Information and Software Technology journal
- Journal of Software: Testing, Verification and Reliability (STVR)

Reviewer for the conferences:

- International Conference on Software Language Engineering (SLE)
- International Conference on Automation Science and Engineering (CASE)

Sub-reviewer for the conferences:

- International Conference on Fundamental Approaches to Software Engineering (FASE)
- European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)
- International Conference on Software Architecture (ICSA)
- International Conference on Performance Engineering (ICPE)
- International Conference on Model Driven Engineering Languages and Systems (MODELS)
- European Conference on Modelling Foundations and Applications (ECMFA)
- Euromicro Conference Series on Software Engineering and Advanced Applications (SEAA)
- International Conference of Systems Modelling and Management (ICSMM)

INVITED TALKS

University of Hamburg, invited by André van Hoorn, Virtual *April 19, 2022*

Talk title : Quality-centric Continuous Software Engineering

SPEC DevOps Research Group, Virtual *November 23, 2021*

Talk title : A model-driven approach for continuous performance engineering in microservice-based systems

AWARDS

2023 SPEC Impact Award *February 6, 2023*

Nominated by : SPEC RG Steering Committee Members; Chairs and Co-Chairs of SPEC RG DevOps

PARTICIPATION TO RESEARCH PROJECTS

MegaM@Rt2 – European project *2017 – 2020*

Title:	MegaModelling at Runtime – scalable model-based framework for continuous development and runtime validation of complex systems
Funded by:	Electronic Component Systems for European Leadership Joint Undertaking (ECSEL-JU) under grant agreement No 737494.
Objectives:	To create a framework incorporating methods and tools for continuous development and validation leveraging the advantages in scalable model-based methods to provide benefits in significantly improved productivity, quality and predictability of large and complex industrial systems.
Contribution:	Definition of the design and runtime methodologies of the framework, definition of approaches for model to model traceability, and for the evaluation of performance and dependability properties.
Website:	https://megamart2-ecsel.eu

PARTICIPATION TO PROJECT PROPOSALS

AIDOaRt – European project *2021 – 2024*

Title:	AI-augmented automation for efficient DevOps, a model-based framework for continuous development At Run Time in cyber-physical systems
Funded by:	Electronic Component Systems for European Leadership Joint Undertaking (ECSEL-JU) under grant agreement No 101007350.
Objectives:	To provide a model-based framework to more efficiently support the continuous software and system engineering of CPSs and CPSoS via AI-augmentation. Complementary to the support for already existing systems of any kind, AIDOaRt also aims at improving the continuous development of new modern CPSs / CPSoS.
Contribution:	Gathering and redaction of industrial use cases for the validation of the expected project results, contribution to the overall methodology and time planning of the project.

TEACHING

Database Systems *2022-2023*

36 hours within the Master's degree course in Data Science at University of L'Aquila, Italy.
Topic: database concepts and design, relational algebra, Entity Relationship diagrams, SQL.

Mobile Applications *2020-2021*

2 hours each year within a Bachelor degree course in Computer Science at University of L'Aquila, Italy.
Topics: Version Control Systems, Git, collaboration practices in software development.

Operating Systems Laboratory *2018*

22 hours within a Bachelor degree course in Computer Science at University of L'Aquila, Italy.
Topics: Linux basics, Bash shell and scripting, filesystem, processes management, permissions.

THESIS CO-SUPERVISION / REVIEWING

Tomáš Drozdík *2023*

Reviewer and opponent. Advisor : Vojtěch Horký
MSc Thesis: Asynchronous Duet Benchmarking

Andrea Reale *2021*

Co-supervision. Advisors : Vittorio Cortellessa, Daniele Di Pompeo
BSc Thesis: Performance of J2EE applications when varying the application server

Enrico Simone Adamelli *2021*

Co-supervision. Advisors : Vittorio Cortellessa, Daniele Di Pompeo
BSc Thesis: Performance unit testing reporting on open source applications

Vincenzo De Petris *2020–2021*

Co-supervision. Advisors : Vittorio Cortellessa, Daniele Di Pompeo
BSc Thesis: Performance benchmarking of a Java application based on the microservices architecture

Roberto Zaccagno *2018–2019*

Co-supervision. Advisors : Romina Eramo, Daniele Di Pompeo
BSc Thesis: Reverse Engineering of a web application based on the microservices architecture

PARTICIPATION TO PHD SCHOOLS

Advanced Statistics and Data Mining, Madrid, Spain *2018*

Courses : Statistical Inference - Román Mínguez (Univ. de Castilla–La Mancha), Bayesian Inference - Mike Wiper, Concepción Ausín (Univ. Carlos III de Madrid), Bayesian Networks - Concha Bielza, Pedro Larrañaga, Bojan Mihaljević (Univ. Politécnica de Madrid), Hidden Markov Models - Agustín Álvarez (Univ. Politécnica de Madrid).

ATTENDED CONFERENCES

- International Conference on Software Architecture (ICSA 2023), L'Aquila, Italy

- International Conference on Performance Engineering (ICPE 2022), Virtual

- International Symposium on Computer Performance, Modeling, Measurements and Evaluation (IFIP 2021), Virtual

- Symposium on Software Performance (SSP 2021), Leipzig, Germany

- Euromicro Conference Series on Software Engineering and Advanced Applications (SEAA 2021), Virtual

- International Conference on Performance Engineering (ICPE 2021), Virtual

- International Conference on Model Driven Engineering Languages and Systems (MODELS 2020), Virtual

- International Conference on Performance Engineering (ICPE 2020), Virtual

- International Symposium on Computer Performance, Modeling, Measurements and Evaluation (Performance 2020), Virtual

- European Conference on Software Architecture (ECSA 2020), Virtual

- Software Technologies: Applications and Foundations (STAF 2019), Eindhoven, Netherlands - **Speaker**

- International Conference on Software Architecture (ICSA 2019), Hamburg, Germany - **Speaker**

- International Conference on Model Driven Engineering Languages and Systems (MODELS 2018), Copenhagen, Denmark - **Speaker**

- International Conference on Software Architecture (ICSA 2018), Seattle, WA, USA - **Speaker**

PUBLICATIONS

Journal articles

2023

Cortellessa, V., Di Pompeo, D., Stoico, V., and Tucci, M. (2023). Many-Objective Optimization of Non-Functional Attributes based on Refactoring of Software Models. In *Journal of Information and Software Technology*.
https://doi.org/10.1016/j.infsof.2023.107159

Traini, L., Cortellessa, V., Di Pompeo, and Tucci, M. (2023). Towards effective assessment of steady state performance in Java software: Are we there yet?. In *Empirical Software Engineering*, 28(1):1-57.
https://doi.org/10.1007/s10664-022-10247-x

2022

Cortellessa, V., Di Pompeo, D., Eramo, R., and Tucci, M. (2022). A model-driven approach for continuous performance engineering in microservice-based systems. In *Journal of Systems and Software*, 183:111084.
https://doi.org/10.1016/j.jss.2021.111084

2021

Traini, L., Di Pompeo, D., Tucci, M., Lin, B., Scalabrino, S., Bavota, G., Lanza, M., Oliveto, R., Cortellessa, V. (2021). How Software Refactoring Impacts Execution Time. In *ACM Transactions on Software Engineering and Methodology*, 31, 2, Article 25, 23 pages.
https://doi.org/10.1145/3485136

2020

Cortellessa, V., Eramo, R., and Tucci, M. (2020). From software architecture to analysis models and back: Model-driven refactoring aimed at availability improvement. In *Journal of Information and Software Technology*, 127:106362.
https://doi.org/10.1016/j.infsof.2020.106362

Conference papers

2022

Di Pompeo, D. and Tucci, M. (2022). Search Budget in Multi-Objective Refactoring Optimization: a Model-Based Empirical Study. In *Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2022), pp. 406-413.*
https://doi.org/10.1109/SEAA56994.2022.00070

2021

Cortellessa, V., Di Pompeo, D., Stoico, V., and Tucci, M. (2021). On the impact of Performance Antipatterns in multi-objective software model refactoring optimization. In *Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2021)*, pp. 224-233.
https://doi.org/10.1109/SEAA53835.2021.00036

2019

Eramo, R., de Kerchove, F. M., Colange, M., Tucci, M., Ouy, J., Brunelière, H., and Di Ruscio, D. (2019). Model-driven design-runtime interaction in safety critical system development: an experience report. In *Journal of Object Technology - European Conference on Modelling Foundations and Applications (ECMFA 2019)*, 18(2):1:1–22.
https://doi.org/10.5381/jot.2019.18.2.a1

Arcelli, D., Cortellessa, V., Di Pompeo, D., Eramo, R., and Tucci, M. (2019). Exploiting architecture/runtime model-driven traceability for performance improvement. In *IEEE International Conference on Software Architecture, ICSA 2019, Hamburg, Germany, March 25-29, 2019*, pages 81–90. IEEE.
https://doi.org/10.1109/ICSA.2019.00017

2018

Cortellessa, V., Eramo, R., and Tucci, M. (2018). Availability-driven architectural change propagation through bidirectional model transformations between UML and Petri net models. In *IEEE International Conference on Software Architecture, ICSA 2018, Seattle, WA, USA, April 30 - May 4, 2018*, pages 125–134. IEEE Computer Society.
https://doi.org/10.1109/ICSA.2018.00022

2012

Eramo, R., Cortellessa, V., Pierantonio, A., and Tucci, M. (2012). Performance-driven architectural refactoring through bidirectional model transformations. In *Proceedings of the 8th international ACM SIGSOFT conference on Quality of Software Architectures, QoSA 2012*, pages 55–60.
https://doi.org/10.1145/2304696.2304707

Workshop papers

2023

Di Pompeo, D., and Tucci, M. (2023). Quality Attributes Optimization of Software Architecture: Research Challenges and Directions. In *3rd International Workshop on Model-Driven Engineering for Software Architecture (MDE4SA 2023) - co-located with IEEE International Conference on Software Architecture, ICSA 2023, L'Aquila, Italy, March 13–17, 2023*.
https://arxiv.org/abs/2301.07516

2021

Cortellessa, V., Di Pompeo, D., Stoico, V., and Tucci, M. (2021). Software Model Refactoring Driven by Performance Antipattern Detection. In *Tools for Stochastic Modelling and Evaluation (TOSME), co-located with IFIP WG 7.3 Performance*.
https://www.performance2021.deib.polimi.it/wp-content/uploads/2021/11/TOSME21_paper_1.pdf

2019

Di Pompeo, D., Tucci, M., Celi, A., and Eramo, R. (2019). A Microservice Reference Case Study for Design-Runtime Interaction in MDE. In *STAF 2019 Co-Located Events Joint Proceedings: 2nd International Workshop on Model-Driven Engineering for Design-Runtime Interaction in Complex Systems (MDE@DeRun), Eindhoven, The Netherlands, July 15 - 19, 2019*, volume 2405 of *CEUR Workshop Proceedings*, pages 23–32. CEUR-WS.org.

http://ceur-ws.org/Vol-2405/06_paper.pdf

2018

Eramo, R., Pierantonio, A., and Tucci, M. (2018). Improved traceability for bidirectional model transformations. In *Proceedings of MODELS 2018 Workshops: MDETools, Copenhagen, Denmark, October, 14, 2018*, volume 2245 of *CEUR Workshop Proceedings*, pages 306–315. CEUR-WS.org.
http://ceur-ws.org/Vol-2245/mdetools_paper_1.pdf

Eramo, R., Pierantonio, A., and Tucci, M. (2018). Enhancing the JTL tool for bidirectional transformations. In *Conference Companion of the 2nd International Conference on Art, Science, and Engineering of Programming - International Workshop on Bidirectional Transformations (BX 2018), Nice, France, April 09-12, 2018*, pages 36–41. ACM.
https://doi.org/10.1145/3191697.3191720

Posters

2023

Di Pompeo, D., and Tucci, M. (2023). Multi-objective Software Architecture Refactoring driven by Quality Attributes. In *IEEE International Conference on Software Architecture, ICSA 2023, L'Aquila, Italy, March 13–17, 2023*.
https://arxiv.org/abs/2301.07500

Doctoral Symposium

2018

Tucci, M. (2018). Model-driven round-trip software dependability engineering. In *Proceedings of the 21st ACM/IEEE International Conference on Model Driven Engineering Languages and Systems: Doctoral Symposium, MODELS 2018, Copenhagen, Denmark, October 14-19, 2018*, pages 186–191, ACM.
https://doi.org/10.1145/3270112.3275337