

Andrea Melis Curriculum Vitae

Department of Computer Science and Engineering
University of Bologna
Bologna, BO 40136 Italy

Office Address: Viale del Risorgimento, 2, 40136 Bologna (BO)
Office Phone: +39 051 20 93148

Email: a.melis@unibo.it

ACADEMIC WEBSITE: <https://www.unibo.it/sitoweb/a.melis>

PERSONAL WEBSITE: <https://www.wildboar.com>

LINKEDIN PROFILE: <https://www.linkedin.com/in/andrea-melis-608a5684/>

Born: January 7, 1989—Lanusei, Italy
Nationality: Italian

Current position

Adjunct Professor, Department of Electrical, Electronic and Information Engineering, *University of Bologna*.

Post-doc Researcher Fellow, Department of Computer Science and Engineering, *University of Bologna*.

Areas of specialisation

Andrea Melis research focuses on aspects of computer security related to innovative software architectures. In particular, his research activity aims to study, design and implement innovative solutions that allow to improve the safety and operational robustness of connected production industrial network and devices for cyber-security contexts.

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1 Education

- 2020 **PhD:** Department of Electrical, Electronic and Information Engineering, *University of Bologna, Italy*
- 2014 **Msc:** Master Degree in Computer Science, *University of Bologna, Italy*
- 2013 **Msc:** Master Ubiquitous Networking, Distributed Systems and Security, *Nice, Polytech Sophia Antipolis, France*
- 2011 **Bsc:** Bachelor of Computer Science, *University of Bologna, Italy*

2 Experience

Andrea Melis' first research collaboration starts at the Polytechnic of Sophia Antipolis at the University of Nice where, as an Internship and Thesis activity, together with Professor Karima Boudaoud and Prof. Marco Prandini of the University of Bologna.

Next Andrea graduated in Computer Science at University of Bologna under the supervision of prof. Marco Prandini.

As soon as he graduated, he started collaborating as a researcher fellow with the DEI department of the University of Bologna, working under the coordination of prof. Franco Callegati on a project with the regional government of Emilia-Romagna.

Andrea then joined the Electronics, Telecommunications, and Information Technologies PhD program at the University of Bologna, where he completed his PhD in 2020 with a thesis entitled "Cybersecurity issues in software architectures for innovative services".

During his PhD program Andrea was visiting researcher for one year at the University of Queensland Australia, joining the team of Prof. Marius Portmann.

After the PhD Thesis discussion, Andrea got his current post-doc position as a researcher fellow at the Department of Computer Science and Engineering at the University of Bologna.

3 Research Activity

3.1 BRIEF SUMMARY OF THE RESEARCH TOPICS

Andrea Melis' research activity began, as an Internship and Thesis activity, studying security issues in a clearing system for public transport.

Following this line of research Andrea Melis subsequently deepened this work, specializing in attacks from Insider Threat actors against software architectures in Smart Mobility context. After getting his Master's degree, he continued his collaboration with the DEI department of the University of Bologna, through the "Mi Nuovo" project for the implementation of a clearing system for regional public transport.

As a PhD candidate Andrea widened the application contexts of his research investigating the security threats of the emerging service enabler architectures.

During his PhD program Andrea was visiting researcher for one year at the University of Queensland Australia. In this period Andrea worked on the integration at the controller level of programmable data planes in P4 language, within advanced and software defined network architectures.

After the PhD Thesis discussion Andrea then started a post-doc position, where he now works on Cybersecurity solutions for advanced software architecture mainly for Industrial environment context.

3.2 BIBLIOMETRIC INDEXES

- Papers in the last 5 years: 24
- Citations in the last 10 years: 310
- h-index in the last 10 years: 11

3.3 RESEARCH PROJECTS WHERE ANDREA MELIS HAS BEEN INVOLVED

3.3.1 International projects

from 01-01-2016 to 31-12-2016

SMALL Smart Mobility for ALL, EIT Digital, Innovation Activity N.16126

- Member of the Research Group
- Platform development.
- Threat Assessment, MaaS Stack design.

from 01-01-2011 to 31-05-2015

EINS - Network of Excellence in Internet Science, VII FP, prog. N. 216863

- Member of the Research Group
- Data Anonymization analysis.

3.3.2 National projects

from 25-10-2019 to 31-05-2022

Integration of IoT connectivity via 5G network (5GConnect) (CUP Code: C41J20000040008), of which Bonfiglioli Riduttori S.p.A. is coordinator, funded under the "Call for the selection of technological innovation projects" issued by BI-REX on 25 October 2019, on a mandate and based on funds from the Ministry of Economic Development, in line with the purposes of the Ministerial Plan 12 September 2017 n. 214 for the establishment of highly specialized Industry 4.0 competence centers;

- Member of the Research Group
- 5G security analysis
- Infrastructure Development

from 01-01-2019 to 31-12-2021

POR-FESR 2014-2020, Action 1.2.2, Project "I4S: Industria 4.0 Sicura (Cybersafe Industry 4.0)"

- Member of the Research Group
- ICS infrastructure development
- ICS protocols pentest

from 24/07/2014 to 30/06/2016

member of the research unit in the technical / scientific collaboration agreement with the Directorate General for infrastructural networks, logistics and mobility systems of the Emilia Romagna Region in relation to the design of the "Mi / Muovo" regional clearing model / system.

3.4 FELLOWSHIPS

2018-2019	6 months Scholarship for visiting PhD by Marco Polo Program
2013	6 months Scholarship for deserving students by University of Nice for Master 2 Programs
2012	6 months Scholarship by the Erasmus EU program
2009-2012	Sardinia Regional Government Annual Fellowship for Deserving Students of Scientific University Programs.
2008	Sardinia Regional Government Fellowship for Deserving Bachelor Students

3.5 AWARDS

2021	Offensive Security Certified Professional (OSCP). Credential ID OS-101-31614
2020	CVE-2020-26694 Disclosed Vulnerability

3.6 MEMBER OF COMMITTEE PROGRAMS, JOURNAL BOARD, REVIEWER PROGRAMS

3.6.1 Journals

2020-2021	Editor of the Special Issue for Cybersecurity and Privacy Journal "Microservices and Security" (ISSN 2624-800X).
2019-Present	Member of the Reviewer Board of Future Internet Journal (ISSN 1999-5903)

- 2020-Present Reviewer for IEEE Access Journal (Access-2020-12261)
- 2019-Present Reviewer for Applied Sciences Journal (ISSN 2076-3417; CODEN: ASPCC7)
- 2019-Present Reviewer for The International Journal of Urban Policy and Planning (ISSN: 0264-2751)
- 2018 Reviewer for International Journal of Network Management (ISSN:1099-1190)
- 2017 Reviewer for IEEE Transactions on Dependable and Secure Computing (ISSN: 1941-0018)

3.6.2 Conferences

- 2021 Co-Chair for: Disinformation - Cybersecurity Risks and Responses: GoodIT Special Session
- 2018 Co-Chair for: Security in Crowdsourced Applications, Goodtechs Special Session
- 2020 Local Chair for: International Conference on Microservices 2020
- 2020 Local Organizer for: BOlogna Federated Conference on Programming Languages 2020
- 2020 Member of the Program Committee for: International Conference on Microservices 2020
- 2020 Member of the Program Committee for: 21st International Conference on Agile Software Development
- 2018 Member of the Program Committee for: Second International Workshop on Microservices: Agile and DevOps Experience
- 2018 Member of the Technical Program Committee for: International Conference on Smart Objects and Technologies for Social Good
- 2019,2020 Reviewer for The Hawaii International Conference on System Sciences.
- 2018,2019,2021 Reviewer for Conference on Innovation in Clouds, Internet and Networks.
- 2018 Reviewer for IEEE Conference on Network Functions Virtualization (NFV) and Software Defined Networks (SDN).
- 2017 Reviewer for IEEE Symposium on Computers and Communications.

4 Teaching

- 2020-2021 **ADJUNCT PROFESSOR** Course: Real Time OS M (Module 2) at Department of Electrical, Electronic and Information Engineering, *University of Bologna, Italy*
- 2021 **INVITED LECTURE** Course: Laboratory of Network Programmability and Automation at Department of Computer Science and Engineering, *University of Bologna*
- 2020-2021 **TEACHING TUTOR** Course: Computer and Network Security Lab T at Department of Computer Science and Engineering, *University of Bologna*
- 2014-2021 **TEACHING TUTOR** Course: Laboratory of System Administration T at Department of Computer Science and Engineering, *University of Bologna*
- 2018 **ADJUNCT PROFESSOR** Module for: Securing the Internet of Things at Bologna Business School, *University of Bologna, Italy*

5 Talks

- 2021 "A Programmable Data Plane Framework for security oriented solutions", GTTI Workshop
- 2020 "A Survey on Microservices Security: Preliminary Findings", Microservices 2020
- 2020 "TechNETium: Atomic Predicates and Model Driven Development to Verify Security Network Policies, Annual Consumer Communications and Networking Conference

- 2018 "Security network policy enforcement through a SDN framework", International Telecommunication Networks and Applications Conference
- 2018 "Securing the Internet of Things past and future challenges", Seminar at University of Bologna
- 2017 "Insider Threats in Emerging Mobility-as-a-Service Scenarios", Hawaii International Conference on System Sciences
- 2016 "Crowdsensing for smart mobility through a service-oriented architecture", IEEE International Smart Cities Conference (ISC2)
- 2015 "Data-set Anonymization Framework, for Public Transport Operators", Interdisciplinary Cyber Research (ICR) Workshop

6 Public Engagement

2017-Present **Unibo Laboratory of Information System Security**
 Founder of the University Research Group "Ulisse". Within this group Andrea Melis in addition to having contributed to the main research activities, has supported students and members of the group in the development of many projects related to the security of information systems. Some of the main activities include:

- Co-Supervision of more than 40 Bachelor Computer Science Thesis
- Co-Supervision of more than 10 Master Computer Science Thesis
- Supervision of more than 10 Project Activities for the Computer Engineering Degree program
- Founder of the Capture the Flag Ulisse Team
- Seminar and teaching activities regarding CyberSecurity

More information can be retrieved at: <https://ulisse.unibo.it>

2018-Present **CyberChallenge.it Program**
 Tutor for the University of Bologna Node for the CyberChallenge.it Program sponsored by the Italian Ministry of Defense. Andrea' role in this task has been twofold. First organizing the schedule for classes and lab activities together with the other tutors, second Andrea was in charge for 3 teaching modules of the program, in which he showed the theory and practice of attack and defense aspects of Web Applications and Cryptography.

2020-Present **Research Fellow Representative**
 Elected representative of Research Fellows at the Counsel of the Department of Computer Science and Engineering, University of Bologna.

2016-2017 **Research Fellow Representative**
 Elected representative of Research Fellows at the Counsel of the Department of Electrical, Electronic and Information Engineering, University of Bologna.

7 Schools

- 2020 NECS Winter School, *University of Trento*
<https://necs-winterschool.disi.unitn.it/program/>
- 2019 Open Source Mano Hackfest, *IMT of Lucca*
<https://osm.etsi.org/wikipub/index.php/8thOSMHackfest>
- 2019 International Summer School on Machine Learning for CyberSecurity, *University of Padua*
<https://spritz.math.unipd.it/events/2019/PIU2019/PagesOutput/MLS/index.html>
- 2019 Summer School on Machine Learning methodologies and applications for next generation networking, *University of Catania*
<http://netprog.liparischool.it/>
- 2015 Cyber Security Summer School, *Tallinn University of Technology*
<http://www.studyitin.ee/c3s2015>
- 2015 International Summer School on Information Security, *Universidad de Deusto*
<https://www.deusto.es/cs/Satellite/estudios/en/summer-school>
- 2015 IEEE Winter Academy on Internet of Things, *University of Milan*
<https://wfiot2015.ieee-wf-iot.org/winteracademy.html>
- 2014, 2016 Building Trust in the Information Age, summer school on computer security and Privacy Issuing authority, *University of Cagliari*
<https://comsec.diee.unica.it/summer-school/>

8 Personal Bibliography

Journals

- [1] Davide Berardi, Franco Callegati, Andrea Melis, and Marco Prandini. “Password similarity using probabilistic data structures”. In: *Journal of Cybersecurity and Privacy* 1.1 (2021), pp. 78–92. URL: <https://www.mdpi.com/2624-800X/1/1/5>.
- [2] Andrea Melis, Siamak Layeghy, Davide Berardi, Marius Portmann, Marco Prandini, and Franco Callegati. “P-SCOR: Integration of Constraint Programming Orchestration and Programmable Data Plane”. In: *IEEE Trans. Netw. Serv. Manag.* 18.1 (2021), pp. 402–414. DOI: 10.1109/TNSM.2020.3048277. URL: <https://doi.org/10.1109/TNSM.2020.3048277>.
- [3] Catia Prandi, Andrea Melis, Marco Prandini, Giovanni Delnevo, Lorenzo Monti, Silvia Mirri, and Paola Salomoni. “Gamifying cultural experiences across the urban environment”. In: *Multim. Tools Appl.* 78.3 (2019), pp. 3341–3364. DOI: 10.1007/s11042-018-6513-4. URL: <https://doi.org/10.1007/s11042-018-6513-4>.
- [4] Franco Callegati, Saverio Giallorenzo, Andrea Melis, and Marco Prandini. “Cloud-of-Things meets Mobility-as-a-Service: An insider threat perspective”. In: *Comput. Secur.* 74 (2018), pp. 277–295. DOI: 10.1016/j.cose.2017.10.006. URL: <https://doi.org/10.1016/j.cose.2017.10.006>.
- [5] Andrea Melis, Silvia Mirri, Catia Prandi, Marco Prandini, Paola Salomoni, and Franco Callegati. “Integrating Personalized and Accessible Itineraries in MaaS Ecosystems Through Microservices”. In: *Mob. Networks Appl.* 23.1 (2018), pp. 167–176. DOI: 10.1007/s11036-017-0831-z. URL: <https://doi.org/10.1007/s11036-017-0831-z>.

- [6] Silvia Mirri, Catia Prandi, Paola Salomoni, Franco Callegati, Andrea Melis, and Marco Prandini. “A Service-Oriented Approach to Crowdsensing for Accessible Smart Mobility Scenarios”. In: *Mob. Inf. Syst.* 2016 (2016), 2821680:1–2821680:14. DOI: [10.1155/2016/2821680](https://doi.org/10.1155/2016/2821680). URL: <https://doi.org/10.1155/2016/2821680>.
- [7] Franco Callegati, Aldo Campi, Andrea Melis, Marco Prandini, and Bendert Zevenbergen. “Privacy-Preserving Design of Data Processing Systems in the Public Transport Context”. In: *Pac. Asia J. Assoc. Inf. Syst.* 7.4 (2015), p. 4. URL: <https://aisel.aisnet.org/pajais/vol7/iss4/4>.

Conferences

- [1] Davide Berardi, Franco Callegati, Andrea Melis, and Marco Prandini. “Sustainable Infrastructure Monitoring for Security-Oriented Purposes”. In: *GoodTechs '20: 6th EAI International Conference on Smart Objects and Technologies for Social Good, Antwerp, Belgium, September 14-16, 2020*. Ed. by Catia Prandi and Johann Márquez-Barja. ACM, 2020, pp. 48–53. URL: <https://dl.acm.org/doi/10.1145/3411170.3411236>.
- [2] Davide Berardi, Franco Callegati, Andrea Melis, and Marco Prandini. “TechNETium: Atomic Predicates and Model Driven Development to Verify Security Network Policies”. In: *IEEE 17th Annual Consumer Communications & Networking Conference, CCNC 2020, Las Vegas, NV, USA, January 10-13, 2020*. IEEE, 2020, pp. 1–6. DOI: [10.1109/CCNC46108.2020.9045145](https://doi.org/10.1109/CCNC46108.2020.9045145). URL: <https://doi.org/10.1109/CCNC46108.2020.9045145>.
- [3] Andrea Melis, Davide Berardi, and Giallorenzo Saverio. “A Survey on Microservices Security: Preliminary Findings”. In: *Microservices 2020* (2020). URL: <https://www.conf-micro.services/2020/program/>.
- [4] Franco Callegati, Saverio Giallorenzo, Maurizio Gabbrielli, Andrea Melis, and Marco Prandini. “Federated Platooning: Insider Threats and Mitigations”. In: *52nd Hawaii International Conference on System Sciences, HICSS 2019, Grand Wailea, Maui, Hawaii, USA, January 8-11, 2019*. Ed. by Tung Bui. ScholarSpace, 2019, pp. 1–10. URL: <http://hdl.handle.net/10125/59758>.
- [5] Davide Berardi, Franco Callegati, Andrea Melis, and Marco Prandini. “Security network policy enforcement through a SDN framework”. In: *28th International Telecommunication Networks and Applications Conference, ITNAC 2018, Sydney, Australia, November 21-23, 2018*. IEEE Computer Society, 2018, pp. 1–4. DOI: [10.1109/ATNAC.2018.8615186](https://doi.org/10.1109/ATNAC.2018.8615186). URL: <https://doi.org/10.1109/ATNAC.2018.8615186>.
- [6] Andrea Melis, Davide Berardi, Chiara Contoli, Franco Callegati, Flavio Esposito, and Marco Prandini. “A Policy Checker Approach for Secure Industrial SDN”. In: *2nd Cyber Security in Networking Conference, CSNet 2018, Paris, France, October 24-26, 2018*. Ed. by Patrick Hebrard and Solange Ghernaouti. IEEE, 2018, pp. 1–7. DOI: [10.1109/CSNET.2018.8602927](https://doi.org/10.1109/CSNET.2018.8602927). URL: <https://doi.org/10.1109/CSNET.2018.8602927>.

- [7] Giovanni Delnevo, Andrea Melis, Silvia Mirri, Lorenzo Monti, and Marco Prandini. “Discovering the City: Crowdsourcing and Personalized Urban Paths Across Cultural Heritage”. In: *Smart Objects and Technologies for Social Good - Third International Conference, GOODTECHS 2017, Pisa, Italy, November 29-30, 2017, Proceedings*. Ed. by Barbara Guidi, Laura Ricci, Carlos T. Calafate, Ombretta Gaggi, and Johann Márquez-Barja. Vol. 233. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering. Springer, 2017, pp. 132–141. DOI: [10 . 1007/978-3-319-76111-4_14](https://doi.org/10.1007/978-3-319-76111-4_14). URL: https://doi.org/10.1007/978-3-319-76111-4_14.
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- [9] Franco Callegati, Maurizio Gabbriellini, Saverio Giallorenzo, Andrea Melis, and Marco Prandini. “Smart mobility for all: A global federated market for mobility-as-a-service operators”. In: *20th IEEE International Conference on Intelligent Transportation Systems, ITSC 2017, Yokohama, Japan, October 16-19, 2017*. IEEE, 2017, pp. 1–8. DOI: [10 . 1109/ITSC . 2017 . 8317701](https://doi.org/10.1109/ITSC.2017.8317701). URL: <https://doi.org/10.1109/ITSC.2017.8317701>.
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- [12] Andrea Melis, Silvia Mirri, Catia Prandi, Marco Prandini, Paola Salomoni, and Franco Callegati. “CrowdSensing for smart mobility through a service-oriented architecture”. In: *IEEE International Smart Cities Conference, ISC2 2016, Trento, Italy, September 12-15, 2016*. IEEE, 2016, pp. 1–2. DOI: [10 . 1109/ISC2 . 2016 . 7580861](https://doi.org/10.1109/ISC2.2016.7580861). URL: <https://doi.org/10.1109/ISC2.2016.7580861>.
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National Conferences

- [1] Andrea Melis, Davide Berardi, Marco Prandini, and Franco Callegati. “An SDN framework to verify security network policy”. In: *ITASEC20 (Italian Conference on Cybersecurity)* (2020).

Misc

- [1] Andrea Melis. “Cybersecurity issues in software architectures for innovative services”. PhD thesis. University of Bologna, Italy, 2020. URL: <http://amsdottorato.unibo.it/9303/>.
- [2] Andrea Melis, Marco Prandini, and Marco Ramilli. “MalwareStats: Improving Static Analysis of Modern Malware through Statistical Characterization of Samples”. In: *EFORENSICS MAGAZINE* (2017). URL: <https://eforensicsmag.com/download/linux-memory-forensics/>.
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