

Carlo Mazzocca

EDUCATION

2020-now University of Bologna (Italy) - Ph.D. in Computer Science and Engineering

- Research activities: authentication and authorization solutions for cloud-to-thing continuum systems, system modeling, blockchain, federated-learning

2023 Florida International University, FIU (United States) – International Ph.D. Exchange (6 months)

- Research activities: revocation of verifiable credentials in IoT networks, survey on decentralized identifier and verifiable credential.

2018-2020 University of Naples Federico II (Italy) - Master's degree in Computer Engineering Cum Laude (Summa Cum Laude) with a GPA of 29.75 on a 30.00 scale

- Relevant modules: Digital System Design, Computer System Design, Design and Development Software Systems, Advanced Computer Architecture and GPU Programming, Secure System Design, Distributed Systems, Data Mining, Computer Systems Performance Analysis, Embedded System, and Software Security for Industrial System
- Final Thesis: "Secure methodologies for secure microservice applications based on the Security-by-Design paradigm"

2015-2018 University of Naples Federico II (Italy) - Bachelor's degree in Computer Engineering Cum Laude (Summa Cum Laude) with a GPA of 29.29 on a 30.00 scale

- Relevant modules: Programming, Software Engineering, Database Systems, Operating Systems, Computer Architecture, Object-Oriented Programming, Computer Networks, and IT for industrial automation
- Final Thesis: "Fault tolerance and replication in container-based software systems"

2019 STMicroelectronics, Naples (Italy) - NeaPolis Innovation Summer Campus 2019

- Undertook two week-intensive seminars and laboratory sessions related to the use of 32-bit micro-controllers and real-time operating systems
- Designed a dam project whose main aim was to realize a monitoring system of a dam using STM32 microcontroller and sensors

WORK AND TEACHING EXPERIENCE

2022/2023 Assistant professor in Computer Lab, Numerical Analysis, University of Bologna (Italy)

2021/2022 Assistant professor in Smart Services For Industry 4.0, Fondazione Alma Mater, Bologna (Italy)

2021/2022 Assistant professor in Fundamentals of Computer Science, Telecommunications Engineering, University of Bologna (Italy)

2021/2022 Professor in Fundamentals of Security and Cryptography, Master in Cybersecurity: from design to operations, Fondazione Alma Mater, Bologna (Italy)

2019 Bit4id through Generazione Vincente, Naples (Italy) – Software Engineer
Business: Public Key Infrastructure, Technologies for Authentication, Digital Signature, and Cryptography

- Computer security project
- Development of applications for digital authentication
- Blockchain-based application development (Hyperledger)
- Analysis of electronic voting system using blockchain

PUBLICATIONS

Published 10 peer-reviewed articles in top journals and conference proceedings. The following is a partial list of the most recent publications. The complete list can be found through Google Scholar (<https://scholar.google.com>).

1. Mazzocca C., Romandini N., Mendula M., Montanari R., Bellavista P. "TruFLaaS: Trustworthy Federated Learning as a Service". In: IEEE Internet of Things Journal, 2023
2. Al Sadi A., Mazzocca C., Melis A., Montanari R., Prandini M., Romandini N. "PIOTA: A Cloud-Based Geographically Distributed Threat Alert System That Leverages P4 and IOTA", In: Sensors, 2023
3. Romandini N., Mazzocca C., Montanari R. "Federated Learning Meets Blockchain: a Power Consumption Case Study". In: 31st Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP), Napoli, Italy, 2023
4. Mazzocca C., Romandini N., Colajanni M., Montanari R. "FRAMH: A Federated Learning Risk-based Authorization Middleware for Healthcare". In: IEEE Transactions on Computational Social Systems, 2022
5. Mazzocca. C, Sabbioni A., Montanari R., Colajanni M. "Evaluating Tangle Distributed Ledger for Access Control Policy Distribution in Multi-region Cloud Enviornments". In: International

Conference on the Quality of Information and Communications Technology (QUATIC),
Talavera de la Reina, Spain, 2022

TECHNICAL SKILLS

- **Programming** - Developed software application using Python. Good knowledge of C/C++. Programmed in Java, Assembly, and SQL. Basic Knowledge of CUDA Programming. Intermediate knowledge of Machine Learning libraries and MATLAB. Competent in using Windows and Linux operating systems
- **Modeling and designing** - Gained experience in modeling and designing software systems using iterative and incremental development methods (Agile and Scrum). During a regional project, which involved all the universities of Emilia-Romagna and some local companies, modeled an industrial implant. Undertook a university group project aimed to carry out a system capable of measuring the memory consumption associated with random interactions of a user with an Android device. Digital systems design with VHDL and synthesis on FPGA Xilinx. Modeled and created a relational database for a university group project
- **Other knowledge** - Techniques for analysis of computer systems security and performance. Considerable knowledge of symmetric and asymmetric ciphers, cryptography data integrity algorithms, network, and Internet security. Driver and protocol design. Blockchain technologies. Architecture for Federated Learning environments. ML algorithms

LANGUAGES

- **Italian** (Native).
- **English** (Proficient – C1) - Certificates: Hold First Certificate in English (FCE) issued in September 2014.

COMMUNICATION AND ORGANISATIONAL SKILLS

- Team work skills gained through successfully coordinating more than 10 students in designing and developing university group projects and thesis
- Good organizational and time management skills acquired while working and studying at the same time

REFERENCES AVAILABLE ON REQUEST