



Simone Guarino

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SUMMARY

I am graduated in Biomedical Engineering, specialised in the e-Health sector for the development of Internet of Things (IoT) platforms. During my Bachelor's degree in Industrial Engineering, I started a collaboration with Automatics Research Unit operating in Campus Bio-Medico University of Rome. In the two-year period 2018-2019, I was involved in the "SmartBench" project funded by INAIL (Istituto Nazionale Assicurazione Infortuni sul Lavoro) during which I dealt with advanced sensors, Android applications and indoor localization algorithms. I am currently a PhD student in the same laboratory: my research activity is concerned with cyber security in industrial environment with a particular focus on possible defensive strategies against APT attacks against SCADA systems.

My academic career and my professional experiences allowed me to deepen aspects of engineering and of the research field in which I reinforced my passion for learning and my curiosity in a world of continuous innovation at service of society and the individual. Thanks to my collaborations, I was able to hone my ability to work in a team and my communication skills in professional environments: my versatile and creative approach allows me to deal with new contests and challenges in an always proactive perspective. The collaboration with the Automatics Research Unit of the Campus Bio-Medico University of Rome has also allowed me to increasingly appreciate the world of research towards which I have always shown strong passion and dedication.

EMPLOYMENT HISTORY

University Campus Bio-Medico of Rome

30/11/2020 – until now

PhD student at the Automatics Research Unit - "Coserity Lab"

- My research project focuses on the study, development and design of solutions for the defence of OT systems against APT (Advanced Persistent Threat) attacks, improving the ability to identify anomalous behaviour.
- The goal is to create a hybrid detection system that integrates characteristics of the model-based and behavioral-based approaches using also a local Digital Twin of the process.

University Campus Bio-Medico of Rome

30/10/2018 – 30/11/2020

Collaboration with the Automatics Research Unit - "Coserity Lab"

- Study of the state of the art about IT security in the industrial sector.
- Implementation of cyber-attacks against a water testbed using Kali Linux.
- Study of possible defence strategies by means of Intrusion Detection System (IDS) and / or Intrusion Prevention System (IPS) software such as Snort or Suricata and machine learning algorithms.
- Virtual extension of water testbed for real-time simulation of Cyber-Physical systems through the MiniCPS software.
- Review of numerous scientific articles.
- Publication of three scientific articles.

Teleconsys S.p.A.

01/09/2020 – 3/10/2020

Self-employed worker under occasional collaboration

- Tutoring for the course "Fondamenti di Cybersecurity"
Aim of the course was to show basic elements of cyber security in terms of threats, problems and the role of the user; technological tools to limit exposure to cyber risk; the main regulatory and organizational aspects related to cyber security.

Lutech S.p.A.
Job Shadowing employment

28/09/2018 – 31/10/2018

- I was involved in supporting health personnel after the renewal of the digital medical record at the Campus Bio-Medico University Hospital in Rome.

University Campus Bio-Medico of Rome

15/05/2018 – 30/10/2018

Self-employed worker under occasional collaboration at the Automatics Research Unit - "Coserity Lab"

- Collaborator for the "SmartBench" project promoted by Inail which had the goal to develop a SmartPlatform for the integrated safety of High Reliability industrial plants.
- Development of an Android application for the connection with wearable and environmental sensors via BLE protocol: the first ones consisted of an inertial platform for recognizing the status of the worker and, in particular, of a possible fall; the latter ones consisted of sensors such as thermometer, hygrometer, barometer and CO meter.
- Development of an indoor localization algorithm based on fuzzy logic.

EDUCATION

University Campus Bio-Medico of Rome

11/2018 – 10/2020

Master's degree in Biomedical Engineering- 110/110 cum laude and honour mention for the academic career

Thesis project: "Cyber range for a water distribution system and virtual extension" carried out at Automatics Research Unit - "Coserity Lab" - operating in Campus Bio-Medico University of Rome and in collaboration with the NICS Lab of the Universidad of Malaga.

The aim of the thesis was to respond to the need to have protected and limited environments in order to reconstruct real or hypothetical scenarios of cyber-attacks against SCADA systems. A further goal was to recognize and block the highest possible number of attacks through the use of IDS / IPS software and machine learning algorithms.

University Campus Bio-Medico of Rome

10/2015 - 07/2018

Bachelor's degree in Industrial Engineering - 110/110 cum laude and honour mention for the academic career

Thesis project: "Sviluppo di un sistema per aumentare la sicurezza dei lavoratori in ambienti complessi", carried out at Automatics Research Unit - "Coserity Lab" - operating in Campus Bio-Medico University of Rome as part of the project "SmartBench".

The goal of the thesis was to develop an algorithm implemented in an Android application in order to recognize, using wearable sensors, situations of potential danger for a worker, such as running or falling.

High School San Giuseppe Del Caburlotto

09/2010 – 07/2015

Scientific High School diploma - 100/100 cum laude

LANGUAGES

ITALIAN: Mother tongue

ENGLISH: B2 - Good knowledge of written and spoken language with particular reference to technical-scientific language in the field of biomedical engineering, cybersecurity and critical infrastructures

SOFTWARE

- ECDL – Certificate 2014
- Android Studio – Advanced user
- Matlab and Simulink– Intermediate user
- Java – Intermediate user
- Python – Intermediate user
- OnShape: Modern Cad – Intermediate user
- SimScale: Simulation Software– Intermediate user
- Kali Linux – Intermediate user
- Ubuntu – Intermediate user
- Snort – Intermediate user
- Eagle – Intermediate user
- Cisco Packet Tracer – Intermediate user
- Office – Base user
- C/C++ – Base user
- Latex – Base user
- Comsol – Base user
- VeraCrypt – Base user
- GnuPG – Base user

TRAINING COURSES

Model Predictive Control – IMT Lucca 3,4,5,8,9 June 2020

Course for PhD students held by Professor Alberto Bemporand for a total of 20 hours. The course contents covered theory and practice on predictive control models for linear, linear constraint, non-linear, stochastic and dynamic hybrid systems as well as numerical optimization methods for the implementation of control models.

SCIENTIFIC INIZIATIVES AND COMPETITIONS

Virtual Reality Life Science Contest - Lazio Innova, Comau Robotics, Regione Lazio and Fondazione Mondo Digitale **06/2020**

Implementation of a project proposal regarding a mobile application that allows the public transport user to move throughout the Lazio region in total safety, knowing the real time crowding level in the bus lines. The project has the goal to counter the spread of Covid-19.

"I Giovani talenti della robotica" – Hackathon at University Roma Tre; Romecup 2019

03/2019

Implementation of a project proposal regarding a robotic solution for the cognitive, emotional and motor support of the elderly.

"Innovathon" Hacathon - Leonardo spa, Talent Garden Ostiense

11/2019

Development of a robotic prototype for the release of first aid kits to injured people in dangerous or hard to reach environments. Through the use of two electronic boards, Arduino and Raspberry, proximity sensors and a camera, a 4-wheel robot has been created which, following a line drawn on the ground, releases a small rescue kit if the camera detects the presence of a person.

"Tech Care Hackathon" - Università Campus Bio-Medico di Roma – *second place*

12/2018

Implementation of a project proposal for a smart medicine dispenser as support for the elderly.

ARTICLES, PUBLICATIONS AND REVISIONS

A Wearable Platform to Identify Workers Unsafety Situations, 2019 II Workshop on Metrology for Industry 4.0 and IoT (MetroInd4.0&IoT); R. Setola, P. Bragatto, C. Fioravanti, M. Gnoni, S. Guarino, L. Faramondi

A Privacy-Oriented Solution for the Improvement of Workers Safety, The 42nd International ICT Convention – MIPRO 2019; R. Setola, P. Bragatto, C. Fioravanti, S. Guarino, L. Faramondi

New Perspectives on Wearable Devices and Electronic Health Record Systems, IEEE MetroInd4.0&IoT 2020; G. Assenza, C. Fioravanti, S. Guarino, V. Petrassi,

Reviewer for the 59th Conference on Decision and Control, Jeju Island, Republic of Korea, December 8th-11th, 2020

Reviewer for the IEEE International Conference on Systems, Man and Cybernetics (SMC), Toronto, Canada, October 11th-14th, 2020

Reviewer for the IEEE International Conference on Systems, Man and Cybernetics (SMC), Bari, Italy, October 6th-9th, 2019

Reviewer for the International Conference on Control, Decision and Information Technologies (CoDIT), Prague, Czech Republic, June 29th-July 2nd, 2020

Reviewer for the American Control Conference (ACC), Philadelphia, PA, USA, July 10th-12th, 2019

Reviewer for the IEEE Control Systems Society Conference, Journals, Award Management System, Nice, France, December 11th-13th, 2019

Reviewer for the IEEE Control Systems Society Conference, Journals, Award Management System, Nice, France, December 11th-13th, 2019

Reviewer for International Journal of Critical Infrastructure Protection: 3 reviews

MISCELLANEOUS EXPERIENCE

- Member of the Italian Catholic Action: I collaborate with my parish for numerous voluntary initiatives such as Caritas dinners, catechism classes and assistance at parish celebrations.
- MD - - Candidate as the best student of the Faculty of Biomedical Engineering of the Campus Bio-medico University of Rome for the A.Y. 2019/2020.
- Scholarship winner for the Student Mobility for Traineeship Call - Erasmus + Program for the A.Y. 2019-2020.
- Candidate and Elected as the best student of the Faculty of Industrial Engineering for the A.Y. 2015/2016.
- Winner of the European competition "Movimento per la Vita" in 2014.

Roma, 08/09/2020

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