Camilla Fioravanti

Master's Degree in Biomedical Engineering at the University Campus Bio-Medico of Rome. I am interested in distributed fault detection algorithms, cyber-physical systems and sensor networks. I am extremely focused, motivated and determined to achieve my goals, especially when these arise from inputs that meet my passions.

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Employment History

Job Experiences

- **October 2018—November 2018, Collaboration Contract with the Automatic Control Unit**
  Coserity Lab, University Campus Bio-Medico of Rome.

  Collaboration within the national project SmartBench.

Research Projects

- **2018-2019, National Project SmartBench**
  The project, funded by INAIL, aims to develop smart systems for safeguarding the health and safety of workers in highly reliable industrial plants, placing itself in the context of Industry 4.0. The SmartBench system is composed of several modules and is devoted to improving the prevention of injuries and accidents within a plant. The Automatic Control Unit of Università Campus Bio-Medico di Roma has developed a sensor prototype capable of detecting plant alterations (environmental sensor) by measuring quantities such as temperature, pressure, humidity, CO percentage, and human status alterations (wearable sensor) via accelerometric signals of the worker to detect dangerous situations.
  My contribution to the project included:
  - Software development of sensorized STMicroelectronics boards;
  - Implementation of a BLE communication protocol among STMicroelectronic boards and Android applications;
  - Data acquisition and prototype testing in a safety — critical industrial environment in the outskirts of Brindisi;
  - Realization of the demo;
  - Participation, preparation and display of the prototype at the final event of the project.

  The main results of the above research activity have been collected in two peer-reviewed papers presented at international conferences (Papers n. 1 and 2 listed below).

Invited Talks

- **October 2020, Seminar**
  University Campus Bio-Medico of Rome
  Fault detection in Industry 4.0: from classical methodologies to modern smart networked approaches.

- **November 2020, Seminar**
  University Campus Bio-Medico of Rome
  Laplacian graph drawing and Clustering techniques.

Employment History (continued)

Mentoring

- **2018-today, Personal Tutor Activity** for Industrial Engineering students University Campus Bio-Medico of Rome.

Research Activity

Journals

- A paper regarding a novel distributed fault detection algorithm for smart water distribution networks is currently under development based on the results of my Master's Thesis. The paper, in cooperation with prof. Polycarpou (University of Cyprus) and profs. Oliva and Setola is scheduled for submission in Early 2021 in the IEEE Transactions on Control of Network Systems.

Conference Papers

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

   The paper illustrates the solution developed within the SmartBench project based on wearable sensors to monitor the workers' status. It involves a waist mounted platform able to detect several situations ranging from standing, running, falling, laying down, etc. and equipped with environmental sensors able to monitor the presence of carbon monoxide, humidity, temperature, etc. On the base of such data, the system is able to detect anomalous situations.

2. **A Privacy – Oriented Solution for the Improvement of Workers Safety**
   Faramondi, L., Bragatto, P., **Fioravanti**, **C.**, Gnoni, M.G., Guarino, S., & Setola, R. in MIPRO 2019 42nd International Convention on Information and Communication Technology, Electronics, and Microelectronics, (2019).

   The paper proposes a fully distributed solution for the management of data related to workers in critical environments, facing the problem of low confidence due to a potential monitoring of workers' activities. In the context of Smart-Bench project and using an architecture based on deployed and wearable sensors, the system is able to provide information about the environmental status directly and exclusively to the worker, in order to avoid any possible incorrect abuse of the data.

3. **New perspectives on wearable devices andelectronic health record systems**
   Assenza, G., **Fioravanti**, **C.**, Guarino, S., & Petrassi, V. in 2020 IEEE International Workshop on Metrology for Industry 4.0 & IoT.

   The paper provides a review of the main wearable solutions for activity recognition and medical devices, with the aim to analyze new perspectives based on the integration of these systems within management platforms for electronic health records. Authors also analyzed guidelines and standards existing in relation to these devices and provided cybersecurity concepts associated to medical wearable devices.

Research Activity (continued)

Reviewer Activity

2018 - today, Formally appointed subreviewer of international conference papers, under the supervision of prof. Gabriele Oliva.

- IEEE American Control Conference (ACC), 1 paper.
- Int. Conference on Robotics and Automation (ICRA), 1 paper.
- IEEE Conference on Decision and Control (CDC), 1 paper.
- Int. Conference on Control, Decision and Information Technologies (CoDIT), 1 paper.
- IFAC World Congress, 1 paper.

2019 - today, Reviewer of international conference papers and journals.

- Int. Journal of Critical Infrastructure Protection, Elsevier, 3 papers.
- IEEE Conference on Decision and Control (CDC), 1 paper.
- IEEE Int. Conference on Systems, Man, and Cybernetics (SMC), 2 papers.
- The IEEE Control Systems Society Conference, Journals, Award Management System (ACC), 1 paper.

Education

2018 – 2020

Master's degree in Biomedical Engineering
University Campus Bio-Medico of Rome.

Curriculum: *eHealth Systems*.
Thesis title: *Distributed measurement re-synchronization for fault detection in cyber-physical systems.*

Final grade: *110/110 cum laude*.
Advisor: prof. Gabriele Oliva Co-advisor: prof. Marios Polycarpou

2015 – 2018

Bachelor's degree in Industrial Engineering
University Campus Bio-Medico of Rome.

Thesis title: *Creation of a Self-Balancing Robot for the estimation of maps of the surrounding environment*.

Final grade: *106/110*.
Advisor: prof. Roberto Setola Co-advisor: prof. Luca Faramondi

2010 – 2015

Scientific High School Diploma
I.I.S. "Margherita Hack", Morlupo (RM).

Final grade: *100/100*.

Skills

Languages	Italian: Mother tongue; English: Good reading, writing and speaking competencies, level C1.
Coding	Matlab, C/C++, Python, Java, Assembly, LaTeX.
Software	Matlab and Simulink, Ccs Pic C Compiler, Iar, Eagle, Comsol Multiphysics, VisUAL, Cisco Packet Tracer, Arduino, Raspberry Pi, OnShape, SimScale.
Misc.	Communication skills and public speaking, proactive mindset, problem solving, team working.

Miscellaneous Experience

2020
- Virtual Reality Contest Life Science participation, Lazio Region.
  "Covid-19. Quali tecnologie (a partire dalla robotica ma non solo) vorresti vedere adottate per affrontare e gestire al meglio l'emergenza sanitaria del nostro Paese?"

2019
- Demostration of the prototype at Inail stand for the SmartBench project at Maker Faire 2019.
- Participation at European Control Conference (ECC) conference 2019, Naples.
- Winner of the call Erasmus+ for Trainesheep 2019-2020, for the experience at the *KIOS* center of excellence in Cyprus (canceled due to the covid 19 pandemic).
- E-TeC (Enac Technology Contest) participation, Enac.
  "Idee tra Terra e Cielo. Droni: le nuove frontiere dell'innovazione tecnologica per lo sviluppo di moderni concetti di servizio"
- Hackathon experience, RomeCup 2019.
  "Giovani Talenti Italiani della Robotica — Sfida sui Superconnected Robot"

Roma, 11/11/2020