# Laura Romeo

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**Summary** Graduated with honors in Automation Engineering at the Polytechnic of Bari.
Ph.D. Student in Industry 4.0, working as a research fellow at the Institute of Intelligent Industrial Systems and Technologies for Advanced Manufacturing (STIIMA), National Research Council of Italy (CNR). Member of the Intelligent, Sensing and Perception (ISP) research group.

**Experience**

**Research Fellow**
**Institute of Intelligent Industrial Systems and Technologies for Advanced Manufacturing (STIIMA)**
**National Research Council of Italy (CNR), Bari, Italy**
Oct. 2019 – *in progress*

- "**MINDBOT**" European project. The aim of the project is to support the worker's motivation and engagement within the cobot-worker interaction in a flexible and personalized way, with the purpose of facilitating active and positive job experiences, thus preventing negative experiences of anxiety or boredom and apathy.
- Research fellowship granted under the funding of the ISP group "**BESIDE**" regional project. **BE**havioral integrated **S**ystem for diagnosis, support and mon**I**toring of neuro-**D**egenerative diseas**E**s. The research project aims to apply AI for gait analysis and behavior of patients with neurodegenerative diseases, developing a vision-based system for the physical performance assessment of elderly people suffering from dementia.

**Education**

**Inter-University Ph.D. with the University of Bari "Aldo Moro", in INDUSTRY 4.0**
**Department of Electrical and Informatics Engineering (DEI)**
**Polytechnic of Bari, Bari, Italy**
2020 – *in progress*

- Ph.D. Thesis: "**IMPACT**: v**I**sion devices and systems for **M**onitoring the wellbeing of o**P**erators in a worksp**A**ce shared with **C**obots in indus**T**ry 4.0". The project is focused on monitoring the behaviour of operators and cobots sharing a workspace. For that purpose, vision devices and computer vision systems will be integrated into the shared workspace, aiming to lead the cobot to fully adapt to the operators, according to their movements and actions. Computer vision is often associated with deep learning technologies, which enable proper recognition, processing and elaboration of human actions data. In general, body-tracking aims at identifying users within a scene and segmenting them in

significative parts or, equivalently, representing them in ordered arrays of skeleton joints. Such information can make the cobot aware of the operators' actions, which is fundamental in leading the cobot to perform tasks based on the required activity, decreasing eventual risk factors for the operators, thus increasing the production. The project will also focus on the possible monitoring of operators suffering from physical and/or cognitive disabilities, whose support of suitable devices for human-machine interactions can be fundamental for easier insertion in collaborative robotics contexts.

Master's Degree (with honors) in Automation Engineering
Department of Electrical and Informatics Engineering (DEI)
Polytechnic of Bari, Bari, Italy
2017 – 2019

- Experimental thesis entitled "Design and experimentation of a robotic system for the automatic installation of an Internet of Things network in outdoor scenarios". In this work, an automatic deployment of a 6TiSCH network has been developed. Specifically, an Unmanned Ground Vehicle has been used to look for the best deploying position for the IoT sensors in outdoor contexts. The outdoor localization has been estimated by means of an Extended Kalman filter, merging odometry, inertial and GPS measurements. IoT sensors have been configured to guarantee an IoT network topology that provides wide coverage in outdoor areas, making use of multi-hop communications.
- Team Project for "Distributed Measurement and Data Acquisition Systems" exam. In laboratory, a MelfaRV-2FB-D manipulator has been configured to be controlled through LabView and Melfa Basic (V edition).
- Team Project for "Measures for Automation" exam. In laboratory, the Festo Didactic Stations have been studied and analyzed, managing to control them using PLCs Siemens S7-1200.
- Team Project for "Internet of Things" exam. A Smart Home simulation has been developed, using Arduino MKR1000 to control features such as illumination, security alarm and ventilation through a Smartphone.

BASS Automotive Summer School
Centro Studi Componenti per Veicoli SpA (CVIT Bosch Group), Bari, Italy
Sept. 2018

- The aim of this Summer School was to train the selected attendees on the existing technologies in the Automotive industry and to steer them towards the most promising research fields.
  The school was held by alternating lectures given by experienced teachers coming from companies and academia and Teamwork, to promote cooperation and team spirit. Topics:
  - ✓ 0D/1D modeling and simulations of internal combustion engines
  - ✓ Computational Fluid Dynamic Modeling of Intake and Exhaust Systems
  - ✓ Exhaust Gas Treatment systems for Diesel engines (EGR, SCR, DPF)
  - ✓ CFD simulation for GDI engine design
  - ✓ Diesel Combustion Study by Optical Diagnostics
  - ✓ Multi-zone modeling of combustion in Diesel Engines

**Bachelor's Degree in Computer Science and Automation Engineering**
**Department of Electrical and Informatics Engineering (DEI)**
**Polytechnic of Bari, Bari, Italy**
2013 – 2017

- Thesis entitled "Calibration of domestic gas meters based on the thermal-mass measurement principle". In this work, different domestic gas meters have been analyzed, studying the appropriate method to manage the calibration.

**High School Degree**
**Liceo Classico Giustino Fortunato, Pisticci, Italy**
2008 – 2013

## Skills and Abilities

- MatLab & Simulink
- ROS – Robot Operating System
- Python
- C/C++
- Melfa Basic V
- MS Office Package
- LaTEX
- LabVIEW

Time management skills, ability to work under stress or independently.
Team working and problem-solving skills developed during university projects presented at the Polytechnic of Bari, and working as a research fellow at the National Research Council of Italy.

## Language Skills

**Italian Language – *Mother tongue***
**English Language – C1: *technical and engineering knowledge***

## Publications

- **L. Romeo**; R. Marani; A. G. Perri; T. D'Orazio, "Performance Analysis of Body Tracking with the Microsoft Azure Kinect," in Proceedings of the 29th Mediterranean Conference on Control and Automation (MED), Bari, Italy, Jun. 2021
- **L. Romeo**; A. Petitti; R. Marani; A. Milella, "Internet of Robotic Things in Smart Domains: Applications and Challenges," *Sensors* 2020, *20*, 3355
- **L. Romeo**, R. Marani, A. Petitti, A. Milella, T. D'Orazio and G. Cicirelli, "Image-based Mobility Assessment in Elderly People from low-cost Systems of Cameras: a Skeletal Dataset for Experimental Evaluations," in Proceedings of the 19th International Conference on Ad Hoc Networks and Wireless (Ad-Hoc Now), Oct. 2020
- **L. Romeo**, R. Marani, N. Lorusso, M. T. Angelillo and G. Cicirelli, "Vision-based Assessment of Balance Control in Elderly People," in Proceedings of the 2020 IEEE International Symposium on Medical Measurements and Applications (MeMeA), Bari, Italy, Jun. 2020
- **L. Romeo**, A. Petitti, R. Marani and A. Milella, "Internet of Robotic Things in Industry 4.0: applications, issues and challenges," in Proceedings of the 7th International Conference on Control, Decision and Information Technologies (CoDIT), Prague, Czech Republic, Jun. 2020
- **L. Romeo**, A. Petitti, R. Colella, G. Valecce, P. Boccadoro, A. Milella and L. A. Grieco, "Automated Deployment of IoT Networks in Outdoor Scenarios using an Unmanned Ground Vehicle," in Proceedings of the 21st IEEE 2020 International Conference on Industrial Technology (ICIT), Buenos Aires, Argentina, Feb. 2020

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| | ▪ A. Petitti, R. Colella, A. Milella, T. D'Orazio, **L. Romeo**, P. Boccadoro, G. Valecce and L.A. Grieco, "A Robotic-aided IoT System for Automatic Deployment of 6TiSCH Networks," in Proceedings of the 1st Italian Conference of Robotics and Intelligent Machines (I-RIM), Rome, Italy, Oct. 2019<br>▪ **L. Romeo**. "A Robotic-aided IoT system for automatic deployment of a 6TiSCH Network in outdoor scenarios using an UGV," in Proceedings of the 1st National Conference of the Institute of Intelligent Industrial Technologies and Systems for Advanced Manufacturing (STIIMA), Milan, Italy, Dec. 2019 |
| Certified experiences | - International English Language Testing System (IELTS)<br>Certification: C1<br>Jul. 2020<br>- Technical-Scientific Writing Course<br>National Research Council of Italy (CNR), Milan, Italy<br>Nov. 2019<br>- English Certificate: 4/5<br>Rider University, Lawrenceville, United States<br>Aug. 2014 |
| Other Certifications and Hobbies | Member of the International Organization "Mensa"<br>IQ society, Caythorpe, England<br>2018 – in progress |