LORENZO MONTI

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IN SHORT

I achieved my PhD in Computer Science and Engineering in March 2021 at the University of Bologna. My main research activity comprehends the area of edge computing and edge machine learning in the ubiquitous computing context. I'm currently a post-doc researcher at INAF, working on the control software for INAFs radio telescopes (Medicina, Noto and Sardinia Radio Telescope).

EDUCATION

PhD **November, 2017 → October 2020**
Computer Science and Engineering *University of Bologna, Italy*

- Studies in the field of Ubiquitous Computing and Human Computer Interaction, focusing on novel enabling approaches, architectures and technologies with a thesis called Enabling Human Centric Smart Campuses via Edge Computing and Connected Objects.
- thesis: Enabling Human Centric Smart Campuses via Edge Computing and Connected Objects

Supervisor: Prof.Giovanni Pau

Master's degree **October, 2014 → March, 2017**
Computer Science and Engineering *University of Bologna, Italy*

- I obtained my Masters degree at the University of Bologna with a thesis called GlovePi: a wearable device to support many-to-many communication between deaf and blind users.
- External site: https://amslaurea.unibo.it/13206/
- Final vote: 105/110

Relator: Prof.ssa Silvia Mirri

Bachelor's degree **October, 2008 → March, 2014**
Computer Science and Engineering *University of Bologna, Italy*

- I obtained my Bachelors degree at the University of Bologna with a thesis called Sistema di monitoraggio modulare attraverso tecnologie mobile per la sicurezza in ambiente domestico.
- External site: https://amslaurea.unibo.it/6618/

Relator: Prof.ssa Paola Salomoni

EXPERIENCE

Post-doc Researcher at INAF **Nov. 2021 → Now**
IRA, Istituto di Radioastronomia *Bologna*

- DI'm currently working on DISCOS: the control software for INAFs radio telescopes.
- Supervisor: Prof. Rita Tse

Visiting Researcher at Macao Polytechnic Institute **Sept. → Dec., 2019**
Macao Polytechnic Institute *MPI, Macao*

- During my stay at Macao Polytechnic Institute we have defined and adopted a people counting approach with the aim of monitoring persons presence in smart campus classrooms. Such an approach has been improved thanks to specific image processing strategies, so as to be generalized and adopted in different indoor environments, without the need of a specific training phase.
- Supervisor: Prof. Rita Tse

Teaching assistant for the course "Tecnologie Web" **Sept. → Dec., 2018**
School of Engineering and Architecture *University of Bologna, Italy*

- Supervisor: Prof. Paola Salomoni
- Course Info: `https://iol.unibo.it/course/view.php?id=25030`

Teaching assistant for the course "Tecnologie Web" **Sept. → Dec., 2017**
School of Engineering and Architecture *University of Bologna, Italy*

- Supervisor: Prof. Paola Salomoni
- Course Info: `https://iol.unibo.it/course/view.php?id=13004`

Teaching assistant for the course "Applicazioni e Servizi Web" **Sept. → Dec., 2017**
School of Engineering and Architecture *University of Bologna, Italy*

- Supervisor: Prof. Silvia Mirri
- Course Info: `https://iol.unibo.it/course/view.php?id=23117`

Research Fellow, "Assegnista di ricerca" **April, 2017 → October, 2017**
Department of Informatics – Science and Engineering (DISI) *University of Bologna, Italy*

- Project title: "SACHER: Smart Architecture for Cultural Heritage in Emilia-Romagna"
- Goal: the project aims to provide a fundamental contribution to the enhancement and protection of Cultural Heritage, guaranteeing to cultural institutions, conservation-restoration experts and the public an innovative ICT platform, available on the Web, which facilitates access to data on Cultural Heritage (BBCC) throughout the whole phase of their life.
- Supervisor: Prof. Silvia Mirri https://github.com/SACHER-project

Full stack developer **December, 2015 → March, 2016**

- Full stack developer for Stivaleria F.lli Fabbri S.n.c.
- Responsible for developing a boot configurator (front-end) and a management (back-end) verticalized to the company's core business.

Mobile developer **March, 2014 → March, 2015**

- Mobile developer at Aurel S.p.A.
- Responsible for developing an Android app for a proprietary home automation application.

PERSONAL PROJECTS

Pyresonant **June, 2020**

- Design and implementation of a distributed system for the analysis of social distancing through RGB-D cameras (Intel Realsense D415) and convolutional neural networks. The system is based on a DL model, it uses a known network called YOLOv3, created during my period abroad. Through transfer learning methodologies, an ad-hoc model with high accuracy for the project needs was driven. In this case, a pipeline was therefore created as follows: i) Object detection on the RGB stream; ii) After aligning the depth frame with the RGB frame, the distance between the person and the camera is calculated; iii) The distance between people is calculated via Euclidean distance. Finally, quantitative tests were carried out to understand the goodness of the proposed solution.

· https://github.com/LorenzoMonti/Social-Distancing-Realsense

Pyresonant **June, 2020**

· Pyresonant allows the user to use any stringed instrument as a pc keyboard. This is possible thanks to the mapping of the notes with the keys.

· https://github.com/LorenzoMonti/pyresonant

InspectNoise **March, 2019**

· InspectNoise is a real-time sound meter with a glance into single-board computer. The main idea is to have a low-budget device to monitor and analyze acoustic noise. Exploiting environmental data such as temperature, humidity, atmospheric pressure, PM10, PM2.5, PM1.0, and ML algorithms we have significantly improved accuracy performance (in terms of dB SPL).

· https://github.com/LorenzoMonti/inspectNoise

GlovePi **March, 2016**

· GlovePi is a low cost and open source assistive system exploiting a wearable device in order to support deaf-blind people in communication using the Malossi alphabet.

LANGUAGE SELF-ASSESSMENT

	Listening	**Reading**	**Interaction**	**Speaking**	**Writing**
Italian	Native language				
English	B2	C1	B2	B2	C1

TECHNICAL STRENGTHS

Hardware configuration	Desktop & notebook PCs assembling
Programming Paradigms	imperative, object oriented, functional programming
Software configuration	Linux, Mac and Windows installation and configuration
Embedded configuration	Raspberry Pi, UDOO Neo, BeagleBoard, Jetson Nano/NX/AGX
Programming Languages	C/C++, Python, Java, JavaScript, PHP
Data Analysis Tools	R, Python + Pandas/NumPy/Matplotlib
Computer Vision	OpenCV, CUDA, cuDNN
Machine Learning	Scikit-learn, TensorFlow, TensorRT, Keras, YOLOv3
Networking	HTTP, RESTful WebAPI
Databases	SQL, MySQL, MongoDb
Development tools	Git, Gradle, Docker
Markup languages	JSON, YAML, HTML, Markdown, LaTeX
IDEs	Eclipse, IntelliJ Idea, Visual Studio, Android Studio, PyCharm, Atom

ADDITIONAL INFORMATION

Interests: Music, coding, playing guitar, reading, astronomy and travel.

Driving license: B2, with own car.

LIST OF PUBLICATIONS

[1] Lorenzo Monti et al. "RaveGuard: A Noise Monitoring Platform Using Low-End Microphones and Machine Learning". In: *Sensors* 20.19 (2020), p. 5583.

[2] Rita Tse et al. "DeepClass: edge based class occupancy detection aided by deep learning and image cropping". In: *Twelfth International Conference on Digital Image Processing (ICDIP 2020)*. Vol. 11519. International Society for Optics and Photonics. 2020, p. 1151904.

[3] Luca Casini et al. "What Do Patients Tell Doctors on the Internet? Ask AI How to Valorize Online Medical Conversations". In: *2019 28th International Conference on Computer Communication and Networks (ICCCN)*. IEEE. 2019, pp. 1–6.

[4] Lorenzo Monti et al. "Preservation in Smart Libraries: An Experiment Involving IoT and Indoor Environmental Sensing". In: *2019 IEEE Global Communications Conference (GLOBECOM)*. IEEE. 2019, pp. 1–6.

[5] Lorenzo Monti et al. "Smart Sensing Supporting Energy-Efficient Buildings: On Comparing Prototypes for People Counting". In: *Proceedings of the 5th EAI International Conference on Smart Objects and Technologies for Social Good*. 2019, pp. 171–176.

[6] Catia Prandi et al. "Gamifying cultural experiences across the urban environment". In: *Multimedia Tools and Applications* 78.3 (2019), pp. 3341–3364.

[7] Catia Prandi et al. "Smart Campus: Fostering the Community Awareness Through an Intelligent Environment". In: *Mobile Networks and Applications* (2019), pp. 1–8.

[8] Davide Aguiari et al. "Canarin II: Designing a smart e-bike eco-system". In: *2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2018, pp. 1–6.

[9] Giovanni Delnevo et al. "AlmaWhere: A prototype of accessible indoor wayfinding and navigation system". In: *2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2018, pp. 1–6.

[10] Giovanni Delnevo et al. "On enhancing accessible smart buildings using IoT". In: *2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2018, pp. 1–6.

[11] Giovanni Delnevo et al. "Patients Reactions to Non-Invasive and Invasive Prenatal Tests: a Machine-based Analysis from Reddit Posts". In: *2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*. IEEE. 2018, pp. 980–987.

[12] Lorenzo Monti and Giovanni Delnevo. "On improving GlovePi: Towards a many-to-many communication among deaf-blind users". In: *2018 15th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2018, pp. 1–5.

[13] Lorenzo Monti, Catia Prandi, and Silvia Mirri. "Iot and data visualization to enhance hyperlocal data in a smart campus context". In: *Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good*. ACM. 2018, pp. 1–6.

[14] Rita Tse et al. "On assessing the accuracy of air pollution models exploiting a strategic sensors deployment". In: *Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good*. ACM. 2018, pp. 55–58.

[15] Davide Aguiari et al. "Smart Mobility and Sensing: Case Studies Based on a Bike Information Gathering Architecture". In: *International Conference on Smart Objects and Technologies for Social Good*. Springer. 2017, pp. 112–121.

[16] Giovanni Delnevo et al. "Discovering the City: Crowdsourcing and Personalized Urban Paths Across Cultural Heritage". In: *International Conference on Smart Objects and Technologies for Social Good*. Springer. 2017, pp. 132–141.

[17] Silvia Mirri et al. "Fitting like a GlovePi: A wearable device for deaf-blind people". In: *2017 14th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2017, pp. 1057–1062.

[18] Lorenzo Monti et al. "Digital Invasions Within Cultural Heritage: Social Media and Crowdsourcing". In: *International Conference on Smart Objects and Technologies for Social Good*. Springer. 2017, pp. 102–111.

[19] Silvia Mirri et al. “Social location awareness: A prototype of altruistic iot”. In: *2016 8th IFIP International Conference on New Technologies, Mobility and Security (NTMS)*. IEEE. 2016, pp. 1–5.

Lorenzo Monti, March 1, 2022