



Cristina Nuzzi

Date of birth: 01/05/1993 | **Nationality:** Italian | **Gender:** Female |

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● EDUCATION AND TRAINING

2020 – CURRENT – Brescia, Italy
POST-DOC – University of Brescia

Research activity:

- Smart Automation and Robotics independent research activities involving AI applications for robotics and validation campaigns of developed systems.
- Software development for external industries involving computer vision techniques.

Educational activity:

- Course practical exercises, lectures, and group projects support (20h total). *Course:* Laboratorio di Misure Meccaniche e Termiche; *Teacher:* Prof. Matteo Lancini; *Year:* 2020/2021
- Course practical exercises, lectures, and group projects support (20h total). *Course:* Sistemi Meccatronici Interagenti con l'Uomo; *Teacher:* Prof. Alberto Borboni; *Year:* 2020/2021

2017 – 2020 – Brescia, Italy
PH. D. IN APPLIED MECHANICS – University of Brescia

The Ph. D. project focuses on **collaboration** between industrial robots and human operators. The key points of the research are:

- to define a natural and easy-to-use **gesture language** as the communication method between human operators and robots;
- to set up a **real-time monitoring system** that can understand the gestures of the operator and, at the same time, can take care of the safety strategies (intensely using **Deep Learning** models and **AI**);
- to port the whole system intelligence on an **embedded platform** to remove or at least to reduce the usage of a PC.

EQF level 8

2015 – 2017 – Brescia
MASTER DEGREE IN INDUSTRIAL AUTOMATION ENGINEERING – University of Brescia

General skills:

- Economics and Industrial plants design

Technical skills:

- Mechanical systems and applications
- Mechatronics and advanced Control Systems
- Models theory and control
- Robotics and Microrobotics
- Microcontrollers and Industrial Sensors
- Industrial Electronics
- Measurements fundamentals (Electrical, Mechanical, Thermal)
- Python programming language
- LabVIEW fundamentals
- Computer Graphics fundamentals
- 3D Vision Systems

110/110L | EQF level 7

General skills:

- Calculus, Physics, Chemistry, Analytical Mechanics

Technical skills:

- Technical and mechanical drawing and design with SolidWorks
- Machines construction theory
- Electronics and Electrotechnology
- PLC and Control Systems
- Automation fundamentals and Digital Control
- Computer science theory and C and C++ programming languages
- Programming Languages theory (ProLog, Haskell, Scheme)
- Networks and Telecommunication theory and design

94/110L | EQF level 6

● LANGUAGE SKILLS

Mother tongue(s): ITALIAN**Other language(s):**

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C2	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● PUBLICATIONS

Deep Learning Based Machine Vision: First Steps Towards a Hand Gesture Recognition Set Up for Collaborative Robots

<https://ieeexplore.ieee.org/abstract/document/8439044> – 2018

C. Nuzzi, S. Pasinetti, M. Lancini, F. Docchio and G. Sansoni, "Deep Learning Based Machine Vision: First Steps Towards a Hand Gesture Recognition Set Up for Collaborative Robots," 2018 Workshop on Metrology for Industry 4.0 and IoT, Brescia, 2018, pp. 28-33, doi: 10.1109/METROI4.2018.8439044

Development and Characterization of a Safety System for Robotic Cells Based on Multiple Time of Flight (TOF) Cameras and Point Cloud Analysis

<https://ieeexplore.ieee.org/document/8439037> – 2018

S. Pasinetti, C. Nuzzi, M. Lancini, G. Sansoni, F. Docchio and A. Fornaser, "Development and Characterization of a Safety System for Robotic Cells Based on Multiple Time of Flight (TOF) Cameras and Point Cloud Analysis," 2018 Workshop on Metrology for Industry 4.0 and IoT, Brescia, 2018, pp. 1-6, doi: 10.1109/METROI4.2018.8439037

Deep learning-based hand gesture recognition for collaborative robots

<https://ieeexplore.ieee.org/document/8674634> – 2019

C. Nuzzi, S. Pasinetti, M. Lancini, F. Docchio and G. Sansoni, "Deep learning-based hand gesture recognition for collaborative robots," in IEEE Instrumentation & Measurement Magazine, vol. 22, no. 2, pp. 44-51, April 2019, doi: 10.1109/MIM.2019.8674634

Hand Gesture Recognition for Collaborative Workstations: A Smart Command System Prototype

https://doi.org/10.1007/978-3-030-30754-7_33 – 2019

C. Nuzzi, S. Pasinetti,, R. Pagani, F. Docchio, G. Sansoni, "Hand Gesture Recognition for Collaborative Workstations: A Smart Command System Prototype," New Trends in Image Analysis and Processing -- ICIAP 2019, Lecture Notes in Computer Science, vol 11808, Springer, Cham. 2019, pp. 332-342, doi: https://doi.org/10.1007/978-3-030-30754-7_33

RemindLy: A Personal Note-bot Assistant

<https://doi.org/10.1145/3371382.3379456> – 2020

C. Nuzzi, S. Ghidini, R. Pagani, F. Ragni, "RemindLy: A Personal Note-bot Assistant," 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20). Association for Computing Machinery, New York, NY, USA, 2020, pp. 631–632. doi: <https://doi.org/10.1145/3371382.3379456>

Hands-Free: a robot augmented reality teleoperation system

<https://ieeexplore.ieee.org/document/9144841> – 2020

C. Nuzzi, S. Ghidini, R. Pagani, S. Pasinetti, G. Coffetti and G. Sansoni, "Hands-Free: a robot augmented reality teleoperation system," 2020 17th International Conference on Ubiquitous Robots (UR), Kyoto, Japan, 2020, pp. 617-624, doi: 10.1109/UR49135.2020.9144841

Validation of Marker-Less System for the Assessment of Upper Joints Reaction Forces in Exoskeleton Users

<https://doi.org/10.3390/s20143899> – 2020

S. Pasinetti, C. Nuzzi, N. Covre, A. Luchetti, L. Maule, M. Serpelloni, M. Lancini, "Validation of Marker-Less System for the Assessment of Upper Joints Reaction Forces in Exoskeleton Users," *Sensors*, vol. 20, no. 14, 2020, pp. 3899, doi: <https://doi.org/10.3390/s20143899>

MEGURU: a gesture-based robot program builder for Meta-Collaborative workstations

<https://doi.org/10.1016/j.rcim.2020.102085> – 2021

C. Nuzzi, S. Pasinetti, R. Pagani, S. Ghidini, M. Beschi, G. Coffetti and G. Sansoni, "MEGURU: a gesture-based robot program builder for Meta-Collaborative workstations," *Robotics and Computer-Integrated Manufacturing*, vol. 68, 102985, doi: <https://doi.org/10.1016/j.rcim.2020.102085>

HANDS: an RGB-D dataset of static hand-gestures for human-robot interaction

<https://doi.org/10.1016/j.dib.2021.106791> – 2021

C. Nuzzi, S. Pasinetti, R. Pagani, G. Coffetti and G. Sansoni, "HANDS: an RGB-D dataset of static hand-gestures for human-robot interaction", *Data in Brief*, 2021, 106791. doi: <https://doi.org/10.1016/j.dib.2021.106791>

● DRIVING LICENCE

Driving Licence: B

● ORGANISATIONAL SKILLS

Organisational skills

I am a very organized and independent person, taking care of my own research by investigating my ideas with some experiments first and reaching intermediate steps that I further discuss with my co-workers and supervisors. Whenever possible I look out for courses and books to further expand my knowledge and contaminate my own ideas and expertise with the ones of colleagues of other research areas.

I have experience in the management of the courses organized by the Ph. D. program as a Students Representative. I have some experience in managing Master students' Laboratory courses, for which I usually do a portion of the lectures and supervise their experimental work in the Lab. I also supervise Master Thesis projects and work in the development of different spin-off projects of my Laboratory not directly related to my current one.

● COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

I can easily get along with co-workers or superiors and discuss with them my point of view clearly. I can communicate and manage conflicts in an assertive way thanks to some communication courses I've followed during the Ph. D. I have been a Students Representative of Ph. D. students for three years, further refining my communication and leadership skills.

I also assist students during the courses I co-tutor each year and I have some experience in supervising Master Thesis.

● **JOB-RELATED SKILLS**

Job-related skills

- Good programming skills acquired both independently and in University courses (C, C++, Python, HTML, CSS, MATLAB, LabVIEW)
- Proficient user of OSX and Windows operative systems, good user of Ubuntu systems
- Good knowledge of the most famous Machine Learning algorithms and theory
- Good knowledge and usage of Deep Learning algorithms and theory
- Good knowledge and usage of TensorFlow and Keras frameworks
- Good knowledge and usage of ROS

● **OTHER SKILLS**

Other skills

- I'm a passionate reader of fantasy, urban fantasy, and sci-fi novels and books, I also like reading classics and poetry sometimes. This hobby sparked my recent interest in writing.
- I have a life-long passion for role-playing videogames, table-top games, and manga and anime products.
- I practiced figure roller skating for 7 years competitively, and even if I haven't been practicing for years I still love to skate and feel the need to do it sometimes.
- I have good orienteering and self-organizing skills, refined during the month-long Camino de Santiago. I can easily communicate with foreign people even if we don't speak the same language at all.
- I love to travel in the wild, love the silence and scenery of nature. I'm scared of climbing (I fell once) but I love hiking.