

# FRANCESCO GRELLA



## EDUCATION

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<b>University of Genova, Italy</b> <i>Research Fellow</i>	<i>Feb 2023 - Today</i>
<b>University of Genova, Italy</b> <i>PhD Fellow in Bioengineering and Robotics</i>	<i>Nov 2019 - Jan 2023</i>
<b>Oxford Robotics Institute, Oxford, United Kingdom</b> <i>Visiting PhD Student in Robotics</i>	<i>July 2022 - October 2022</i>
<b>University of Genova, Italy</b> <i>Master's degree in Robotics Engineering, Grade: 110/110</i>	<i>Oct 2017 - Oct 2019</i>
<b>University of Genova, Italy</b> <i>Bachelor's degree in Biomedical Engineering Grade: 101/110</i>	<i>Sep 2014 - Oct 2017</i>
<b>Liceo Scientifico "E. Amaldi", Novi Ligure (AL), Italy</b> <i>Scientific high school diploma</i>	<i>Sep 2009 - Jun 2014</i>

## SKILLS

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<b>Languages:</b>	Italian, English, Spanish
<b>Programming:</b>	C++, Python, Java, Javascript
<b>Frameworks/Tools:</b>	ROS, Tensorflow, PyTorch, Matlab, Simulink, LTSpice, Docker, Git VCS, CMake
<b>Other skills:</b>	Deep Learning Architectures, Robotic Software Architectures, Robot Manipulator Control

## RESEARCH INTERESTS

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<b>Robot Control:</b>	Task-based control, Admittance/Impedance control, Force control
<b>Robot Perception:</b>	Distributed Tactile Sensing, Bayesian State Estimation
<b>Artificial Intelligence:</b>	Deep Learning for Tactile Processing, Generative Modeling for Domain Transfer
<b>Tactile Sensing:</b>	FDM and Inkjet printed capacitive pressure sensors

## PUBLICATIONS

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- Safe and Effective Collaboration With a High-Payload Robot: A Framework Integrating Novel Hardware and Software Modules**  
*Grella F. et al.*  
*IEEE Robotics Automation Magazine, 2023*
- Mathematical Model and Experimental Characterization of Vertically Stacked Capacitive Tactile Sensors**  
*Staiano M., Baldini G., Grella F., Frascio M., Maiolino P., Cannata G.*  
*IEEE Sensors Journal, 2023*
- Voluntary Interaction Detection for Safe Human-Robot Collaboration**  
*Grella F., Albini A., Cannata G.*  
*IEEE International Conference on Robotic Computing (IRC) 2022*
- Tactile-Based Human-Robot Collaboration: A Performance Analysis**  
*Grella F., Canale R., Giovinazzo F., Albini A., Cannata G.*  
*'Advances in System-Integrated Intelligence', Springer Nature - 2022*
- Exploiting Distributed Tactile Sensors to drive a robot arm to get through Obstacles**  
*Albini A., Grella F., Maiolino P., Cannata G.*  
*IEEE Robotics and Automation Letters (RA-L) 2021*

## **A Novel Tactile Device for Safe Human-Robot Interaction in Industrial Scenarios**

*Grella F., Baldini G., Wang S.A., Sagar K., Albin A., Jilich M., Cannata G., Zoppi M.*

*Italian Conference on Robotics and Intelligent Machines (I-RIM) 2021*

## **A Tactile Sensor-Based Architecture for Collaborative Assembly Tasks with Heavy-Duty Robots**

*Grella F., Canale R., Baldini G., Wang S.A., Sagar K., Albin A., Jilich M., Cannata G., Zoppi M.*

*IEEE International Conference in Advanced Robotics (ICAR), 2021*

## **Exploring the Relationship between Robot Personality and User Engagement in Verbal Interactions: a Preliminary Study**

*Garello L., Grella F., Castagnetta S., Bruno B., Recchiuto C., Sgorbissa A.*

*17th IEEE Conference on Ubiquitous Robots, Kyoto, Japan, June 2020*

## **PROJECTS**

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### **SestoSenso Horizon Europe Project (<http://sestosenso.eu/>)**

*Nov 2022 - Today*

*Key role in following tasks:*

- Hardware design and integration
- Data acquisition firmware design
- Sensor-based motion control algorithm design
- Software architecture design and implementation
- Dissemination (Deliverables, workshop organization)

### **CoLLaboratE H2020 Project (<https://collaborate-project.eu/>)**

*Nov 2019 - May 2022*

*Key role in following tasks:*

- Hardware design and integration
- Sensor integration
- Software architecture design and implementation

## **TEACHING ACTIVITIES**

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**Teaching Assitant of the 'Embedded Systems' course**

*Academic year: 2023 - 2024*

**Teaching Assitant of the 'Robot Dynamics and Control' course**

*Academic year: 2022 - 2023*

**Teaching Assitant of the 'Flexible Automation' course**

*Academic year: 2022 - 2023*

**Teaching Assitant of the 'Robot Dynamics and Control' course**

*Academic year: 2021 - 2022*

## **CO-SUPERVISED MASTER THESES**

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**Vision-Based Control Strategy for Safe Human-Robot Collaboration**

*Academic year: 2019 - 2020*

**Control Strategies for a Lower Limb Bipedal Hexoskeleton**

*Academic year: 2019 - 2020*

**Computational Model for the Simulation of Deformable Cable Simulation**

*Academic year: 2019 - 2020*

**Study and Implementation of a Real-Time and Fail-Safe Communication System for Tactile Sensors Networks**

*Academic year: 2019 - 2020*

**Study and Implementation of Robot-Assisted Calibration Techniques for Robotic Skin**

*Academic year: 2019 - 2020*

**Tactile-based Touch Classification and Detection for the Control of an Industrial Robot for Human-Robot Cooperative Tasks**

*Academic year: 2020 - 2021*

**Trajectory Adaptation for Human Robot Interaction**

*Academic year: 2020 - 2021*

**Robot Arm Catching a Flying Drone: Vision-based Control Strategies**

*Academic year: 2020 - 2021*