

ELISA IOVENE



Date of Birth: 19/02/1996

Address: Via A. Tadino 46, Milan

Tel: +39 3802168440

Email: eiovene96@gmail.com

TECHNICAL SKILLS

Programming Languages: C++ - Python - Matlab - R

Operative Systems: Windows - Linux - MacOS

Simulation Framework: Gazebo - Unity - AMBF

Middleware: ROS

Graphic Software: Blender

PUBLICATION

A. V. Iordache, A. Casella, E. Iovene, et al, "Envisioning Robotic Exoscope: Concept And Preliminary Results", *Hamlyn Symposium On Medical Robotics 2022*

SOFT SKILLS

I am a dynamic person and a fast learner always willing to face new challenges. During my studies, I developed a strong sense of autonomy and a problem-solving mindset. I enjoy working in teams and believe that communication and collaboration are essential for achieving a common goal.

LANGUAGES

Italian: Native Speaker

English: Fluent (IELTS 7.0)

Spanish: Good (B2)

CURRENT POSITION

PhD Candidate in Bioengineering

May 2021 - Present

Politecnico di Milano, Milan

The research project focuses on human-robot interaction in robotic surgery, with a particular emphasis on robotic control systems and machine learning for neurosurgical application

WORK EXPERIENCE

Teaching Assistant

September 2021 – Present

Politecnico di Milano, Milan

- "Technologies for Motor Behaviour Analysis" Course for the Master Degree in Biomedical Engineering.
- "Bioelettroragnetismo e Strumentazione Biomedica" Course for the Bachelor Degree in Biomedical Engineering.

EDUCATION

Master's Degree in Bioengineering and Technologies for Electronics

September 2018 – April 2021

Politecnico di Milano, Milan

Thesis: "Evaluating the Role of Visual and Force Feedback in a Simulated Surgical Teleoperation System".

Final Grade: 110/110

Bilateral Agreement at Tecnológico De Monterrey

August 2019 – December 2019

Monterrey, Mexico

PROJECTS

Autonomous Robotic Camera Holder for Spinal Surgery

September 2022 – Present

The aim of the proposed system is to assist the surgeon during osteotomy procedures where the risk of causing severe neurovascular injury is high because of the proximity of the spine to critical structures. To this end, variable and adaptive admittance control is used, whereby the robotic system is able to adapt according to the forces detected at the surgical site.

Autonomous Robotic Camera Holder for Neurosurgical Application

May 2021 – Present

The proposed system's main goal is to keep surgery as smooth as possible while reducing the surgeon's workload during neurosurgical procedures. This is accomplished by incorporating an autonomous vision-guided camera holder capable of identifying and tracking the surgical instrument using an object detection neural network. The proposed method is based on a visual servoing technique in which the information provided by the vision system is used in the robotic holder's control loop.

Implementation of Control Algorithms in a Simulated Surgical Teleoperation System.

April 2020 – April 2021.

The primary goal of the MSc thesis was to develop control algorithms for teleoperation of a robotic arm (Kuka LWR4+) using a haptic device (Omni Phantom) to restore the sense of touch during surgical procedures such as palpation. A phone attached to the arm was also used to control an endoscopic camera. The IMU's acceleration and gyroscope data were fused to obtain a stable estimate of the device orientation (roll and pitch).