Magro Mattia

Graduated Biomedical Engineer in the Technologies for eletronic (BTE) field at Politecnico di Milano

LIST OF PUBBLICATIONS OR-CID

Profile

I am a specific and hard-working person with a constant desire to get to know. I always try to accomplish the objectives that I set for my self. Currently enrolled in a Ph.D. on "Computer Vision for Surgical Robot Assistance" at the Department of Electronics, Information and Bioengineering (DEIB) of Politecnico di Milano, co-funded by Medical MicroInstruments, Inc.

Skills

Matlab
C, C++
Python, Pycharm
LaTeX
Windows (7,8,10)
Microsoft Office package
Linux(Ubuntu)
ROS
CAD: Solidworks
CoppeliaSim
Unity
Arduino UNO
Processing
OrCAD PSpice

Soft Skills

Team working
Organization
Problem solving
Desired of knowing
Public speaking

Languages

Italian (mother tongue)
English (B2)

Extracurricular activities

Seller of study notes on the platform *Docity*, sports and gym, chess' player and volunteering as blood donor.

Education and Training

November 2022– present, **Philosophiae Doctor, (Ph.D)** on the "Computer Vision for Surgical Robot Assistance" topic.

September 2019– April 2022, Politecnico di Milano, Milano
Master's degree in Biomedical Engineering, *Rating*: 110/110
Thesis' project: "Robotic Actuation and Autonomous Control of a Tendon-driven Catheter for Structural Intervention Cardiology",
Supervisor: Elena De Momi

October 2016- July 2019, Politecnico di Milano, Milano
Bachelor's Degree in Biomedical Engineering, *Rating*: 101/110
Thesis' project: "Development of a segmentation software to assess the functionality of the heart",
Supervisor: Alberto Cesare Luigi Redaelli

September 2011– July 2016, IISS B. Pinchetti
High School Scientific Diploma, *Rating*: 95/100

Work Experiences

June 2022– October 2022, Politecnico di Milano (Electronic Information and Bioengineering Department (DEIB)), Milano
Extracurricular internship: during this period, I had the opportunity of working with steerable catheters, aiming to improve the current use, developing innovative robotic platforms and control algorithms. I had worked under the supervision of Prof.ssa Elena De Momi and Prof. Emiiano Votta at Neuroengineering and Medical Robotics Laboratory (NearLab).

Relevant projects

Artery project (Grant agreement No. 101017140, *website link*):
"Development of the actuation system and the control algorithm for a tendon driven robot", Politecnico di Milano, *March 2021 - April 2022*

The current medical intervention trend favors a minimally invasive and percutaneous approach. In my *Master thesis's project*, thus, I worked inside the European Artery project with the aim of designing, with the help of *Solidworks*, the robotic actuation system for the *Mitraclip* system, which has been 3D printed (*Ultimaker Cura printer*). Furthermore, I implemented the control algorithm through *Arduino* and the Robot Operating System (ROS) framework. Finally, I integrated the printed structure and the control algorithm to allow the autonomous achievement of the target position.

Path Planning using Reinforcement Learning (RL),
Politecnico di Milano, *October 2020 - February 2021*

Group project: Path Planning in a surgical scenario of laparoscopy with the aim of letting the *da Vinci robot* reaching autonomously a tumor, avoiding healthy tissues. The environment of the simulation was *CoppeliaSim*, while the toolkit for developing the RL algorithm was *OpenAI-Gym*.

Simulating Motor learning of cerebellar network,
Politecnico di Milano, *October 2020 - December 2020*

Group project: Evaluation and analysis of a Neural Network, developed in *Python*, that mimics the cerebellum activity.

Heart Rate Variability Feature extraction,
Politecnico di Milano, *March 2020 - June 2020*

Group project: Literature review and analysis, using *Matlab*, of the Heart Rate Variability (HRV) signal of newborns.

Publications

Title: Robotic Actuation and Control of A Catheter for Structural Intervention Cardiology (*active link*)
Authors: Xiu Zhang, Maria Chiara Palumbo, Francesca Perico, Mattia Magro, Andrea Fortuna, Tommaso Magni, Emiliano Votta, Alice Segato and Elena De Momi
Publication Place: IROS 2022, International Conference on Intelligent Robots and System
Place and Date of Conference: Kyoto, Japan, October 23-27, 2022: (*link to website conference*)
Publisher: IEEE
Accepted on 30/06/2022

Title: Towards an autonomous robotic platform for percutaneous procedures *(active link)*
Authors: Valentina Corbetta, Alice Segato, Andrea Fortuna, Tommaso Magni, Mattia Magro, Xiu Zhang and Elena De Momi
Conference: CRAS 2022, Conference on New Technologies for Computer and Robot Assisted Surgery
Place and Date of Conference: Naples, Italy, April 25-27, 2022: (*link to website conference*)
Accepted, Conference on 27/04/2022

Title: Toward Steerable Needles Autonomous Motion for Mitral Valve Repair (*active link*)
Authors: Mattia Magro, Andrea Fortuna, Xiu Zhang, Maria Chiara Palumbo, Emiliano Votta, Elena De Momi and Alice Segato
Conference: ICRA, Workshop Human-centered Autonomy in Medical Robotics
Place and Date of Conference: Philadelphia, PA, USA, May 23-27, 2022: (*link to website conference*)
Accepted, Conference on 23/05/2022, *active link to the POSTER*

Title: Path Planning and Control of a Steerable Catheter for Mitral Valve Repair in an Augmented Reality framework (*active link*)
Authors: Mattia Magro, Andrea Fortuna, Xiu Zhang, Maria Chiara Palumbo, Emiliano Votta, Elena De Momi and Alice Segato
Conference: Hamlyn Symposium 2022
Place and Date of Conference: London, UK, June 26-29, 2022:(*link to website conference*)
Date: Accepted, Conference on 29/06/2022