

The Art of Manipulation in Robotics and Metaverses

PhD Course held by Prof. Domenico Prattichizzo, PhD, IEEE Fellow
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Technically sponsored by the Italian Chapter of the IEEE Control Systems Society



Course Synopsis

Robotics is an inspiring, interdisciplinary, and cutting-edge research field. It combines the rigorousness of linear algebra with the creativity needed to design innovative hardware and software platforms. Building dexterous robotic hands and studying new algorithms to control them is essential to allow industrial, service, and humanoid robots to interact with objects around them, and, possibly, with humans.

Robotic manipulation refers to the art of controlling the motion of an object by constraining its dynamics through contact with a hand. The process of controlling the manipulation is not limited to robotic hands only, but also applies to human hands and to all other systems using contact constraints to control the motion of the manipulated object that can be real or virtual.

The course will provide notions about mathematical models of manipulation and grasping, will illustrate applications in robotics (control for autonomous grasping, grasp planning) and metaverse (control for autonomous grasping, grasp planning) fields. In addition, confluence examples of robotics and VR methodologies will be presented.

- ▶ Basics of mathematical modeling and automatic control are required
- ▶ Hands-on activities will be carried out
- ▶ Open to all PhD students and researchers
- ▶ Starting Feb 14 at 12:00 in Maxwell Conference Room (DET)
- ▶ Enquiries to alessandro.rizzo@polito.it
- ▶ Calendar: Feb 14: 12-14 and 15-19; Feb 15: 9-13; Feb 20: 12-14 and 15-19; Feb 21: 9-13