



# UNIVERSITÀ DI PAVIA

Anno Accademico 2020/2021

## ROBOTICS

<b>Anno immatricolazione</b>	2019/2020
<b>Anno offerta</b>	2020/2021
<b>Normativa</b>	DM270
<b>SSD</b>	ING-INF/05 (SISTEMI DI ELABORAZIONE DELLE INFORMAZIONI)
<b>Dipartimento</b>	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
<b>Corso di studio</b>	INGEGNERIA ELETTRICA
<b>Curriculum</b>	Sistemi elettrici
<b>Anno di corso</b>	2°
<b>Periodo didattico</b>	Primo Semestre (28/09/2020 - 22/01/2021)
<b>Crediti</b>	6
<b>Ore</b>	50 ore di attività frontale
<b>Lingua insegnamento</b>	English
<b>Tipo esame</b>	SCRITTO
<b>Docente</b>	FACCHINETTI TULLIO (titolare) - 5 CFU LI HOWARD - 1 CFU
<b>Prerequisiti</b>	Basic concepts of computer science and dynamical systems are required.
<b>Obiettivi formativi</b>	The course provides the know-how to design and engineering a robotic system. The study is concentrated on the systemic dimension of the design, i.e., on some of the main building blocks of a robot, their interconnection and control. This organization allows to provide the big picture of a robot system, while providing insights on some aspects that are considered of particular interest.
<b>Programma e contenuti</b>	The program includes the study of the characteristics of the most widely used sensors in robotic applications, including: linear and angular position sensors, pressure sensors, accelerometers, force sensors, thermal sensors, image sensors (cameras), and "time sensors". We will

	<p>study some techniques for the use of sensors and their main application fields will be shown. Techniques and issues in real-time acquisition of sensory data will be explored. Moreover, the subject of Finite State Machines will be introduced as a useful tool for implementing robotic control and coordination algorithms. Finally, we will describe some basic techniques of robot navigation, which make use of different sensors among those presented.</p>
<p><b>Metodi didattici</b></p>	<p>Lectures (hours/year in lecture theatre): 45  Practical class (hours/year in lecture theatre): 0  Practicals / Workshops (hours/year in lecture theatre): 0</p>
<p><b>Testi di riferimento</b></p>	<p>The study material consists mostly of slides available on the course website. For further details of the various topics covered, you can consult the following texts:</p> <p>[1] John Brignell, Neil White. Intelligent Sensor System. Institute of Physics Publishing, Bristol and Philadelphia.</p> <p>[2] Paulo Verissimo, Luis Rodriguez. Distributed Systems for System Architects. Kluwer Academic Publishers.</p> <p>[3] Giorgio C. Buttazzo. Hard Real-time Computing System. Springer.</p> <p>[4] Howie Choset, Kevin M. Lynch, Seth Hutchinson, George Kantor, Wolfram Burgard, Lydia E. Kavraki, Sebastian Thrun. Principles of Robot Motion: Theory, Algorithms, and Implementations. The MIT Press.</p>
<p><b>Modalità verifica apprendimento</b></p>	<p>The exam is based on a single written test regarding the topics covered in the course. There are no tests during the course or oral tests.</p>
<p><b>Altre informazioni</b></p>	<p>Updated information can be found at the page dedicated to the course on the homepage of Prof. Facchinetti.</p>
<p><b>Obiettivi Agenda 2030 per lo sviluppo sostenibile</b></p>	<p><a href="#">Gli obiettivi</a></p>