



ROBOTICS

Anno immatricolazione	2020/2021
Anno offerta	2021/2022
Normativa	DM270
SSD	ING-INF/05 (SISTEMI DI ELABORAZIONE DELLE INFORMAZIONI)
Dipartimento	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
Corso di studio	INGEGNERIA ELETTRICA
Curriculum	Sistemi elettrici
Anno di corso	2°
Periodo didattico	Primo Semestre (27/09/2021 - 21/01/2022)
Crediti	6
Ore	50 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO
Docente	FACCHINETTI TULLIO (titolare) - 5 CFU LI HOWARD - 1 CFU
Prerequisiti	Basic concepts of computer science and dynamical systems are required.
Obiettivi formativi	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.
Programma e contenuti	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>
Metodi didattici	<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>
Testi di riferimento	<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>
Modalità verifica apprendimento	<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>
Altre informazioni	<p>Updated information can be found at the page dedicated to the course on the homepage of Prof. Facchinetti.</p>
Obiettivi Agenda 2030 per lo sviluppo sostenibile	<p>\$lbl legenda sviluppo sostenibile</p>