

PhD Course on Advanced Robotic Grasping

Organizers and Lecturers: Domenico Prattichizzo and Monica Malvezzi

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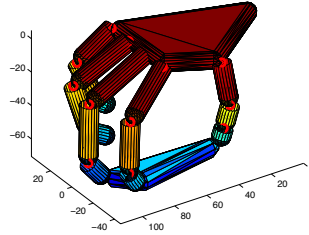
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1 Course Objectives

Robotic grasping literature is not limited to the design, modeling and control of robotic hands manipulating object, but extends its interest to human hands which indeed inspired most of the recent works of roboticists on design of new underactuated hands and control with synergies. This course will talk about hands, with a special emphasis on grasping. A special attention will be devoted to sensori-motor synergies as inspired by studies in neuroscience and on the consequent implications on underactuation and control. The main subjects covered by the course are:

- modeling of multifingered hands
- grasping synthesis and control
- sensorimotor synergies and underactuation
- human and robotic hands
- SynGrasp Matlab Toolbox on grasping



2 Course Organization

The course consists of a series of lectures and seminars. The lectures will be held at the Dipartimento di Ingegneria dell'Informazione e Scienze Matematiche of the Università degli Studi di Siena in via Roma 56, 53100 Siena, Italia, according to the following tentative schedule:

Monday Nov. 26, 2012	14.00 - 18.00	Aula 13	Lecture
Tuesday Nov. 27, 2012	9.00 - 13.00	Aula 103	Seminars and Lab Visit
Tuesday Nov. 27, 2012	14.30 - 16.00	Aula 103	PhD Defense
Wednesday Nov. 28, 2012	9.00 - 13.00	Aula 149 or 13	Lecture
Wednesday Nov. 28, 2012	14.30 - 16.30	Aula 143	Lab (Matlab)
Thursday Nov. 29, 2012	9.00 - 13.00	Aula 13	Lecture
Thursday Nov. 29, 2012	14.30 - 16.00	Aula 103	Lecture
Friday Nov. 30, 2012	9.00 - 13.00	Aula 103	Lecture

The course will be also extended to the afternoon of Tuesday and Wednesday.

3 Tuesday Nov. 27, 2012

09.00 - 09.45 Stefano Caselli, Università di Parma, Beyond Simple Objects: Putting Grasps into Context

09.50 - 10.35 Darwin Caldwell, Istituto Italiano di Tecnologia, Technologies for Humanoid (CO-MAN) and Quadrupedal (HyQ) Robots

10.40 - 11.25 Giuseppe Casalino, Università di Genova, Task and Substitution Priority-based Technique for Agile Mobile Manipulation

11.45 - 13.00 Lab Visit.

14.30 - 16.00 PhD Defense of Gionata Salvietti

The lectures will be given by Domenico Prattichizzo and Monica Malvezzi. Darwin Caldwell (Istituto Italiano di Tecnologia), Giuseppe Casalino (Università di Genova), Marco Gabiccini (Università di Pisa) confirmed their availability to give seminars during the course. More seminars will be probably included in the program. A lab visit is planned during the course week.

4 Grade Policy, Subscription and Information

The grading policy consists of a final work/report to be completed by students who need to get a final certificate.

To subscribe to the course please send an email to prattichizzo@ing.unisi.it. The updated program is available at <http://www.dii.unisi.it/prattichizzo/teaching/phd2012grasping.pdf>

5 Course material

The course material can be downloaded here

<http://www.dii.unisi.it/prattichizzo/teaching/phd2012grasping-coursematerial.zip>