**Motivation and objectives of the research in this field**

Today's collaborative robots are just machines that are safe to work with, but certainly not already suitable to intelligently interact with human co-workers. One of the challenges to be addressed is to propose interfaces and control algorithms designed around the human. In order to go beyond a mere workspace sharing and to aim for a real collaboration between humans and robots, the robot needs to be fully informed of what the human fellow co-worker is doing, or about to do.

**Methods and techniques that will be developed and used to carry out the research**

The research will make use of techniques for object/human perception, using tools from machine learning and artificial intelligence. A robust classification of human activities during, e.g., assembly cycles is foreseen in this project.

**Educational objectives**

The candidate will master techniques for the development of functionalities for human activity segmentation, as well as decision-making capabilities for the robot in order to properly handle these additional information.

**Job opportunities**

The job market for experts in the field of robotics is already large today and is expected to become even more interesting in the coming years. Opportunities to work in the research institutes will also be available.
Composition of the research group

- 3 Full Professors
- 2 Associated Professors
- 0 Assistant Professors
- 4 PhD Students

Name of the research directors
Andrea Maria Zanchettin

Contacts

- andreamaria.zanchettin@polimi.it
- https://zanchettin.faculty.polimi.it

Additional support - Financial aid per PhD student per year (gross amount)

<table>
<thead>
<tr>
<th>Housing - Foreign Students</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
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<tbody>
<tr>
<td></td>
<td>1500.0 € per student</td>
<td>1000.0 € per student</td>
<td>1000.0 € per student</td>
</tr>
</tbody>
</table>

max number of financial aid available: 2, given in order of merit

Housing - Out-of-town residents (more than 80Km out of Milano)

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Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

This scholarship is supported by the Ministry of Research, and part of the project "TIGHT" (Tactile InteGration for Humans and arTificial systems) coordinated by Università degli Studi di Siena (https://www.unisi.it/ricerca/finanziamenti-prin/tight-tactile-integration-humans-and-artificial-systems), see also http://sirslab.diism.unisi.it/TIGHTWorkshop/index.html.

LIST OF UNIVERSITIES, COMPANIES, AGENCIES AND/OR NATIONAL OR INTERNATIONAL INSTITUTIONS THAT ARE COOPERATING IN THE RESEARCH: Università degli Studi di Siena; Università di Pisa; Smart Robots s.r.l. (spin-off company); Università degli Studi di Roma ?Tor Vergata?; Consiglio Nazionale delle Ricerche (CNR).

INCREASE IN THE SCHOLARSHIP FOR STAYS ABROAD: Euro 566,36 per month, for up to 6 months

EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student per year
2nd year: euros per student (1534)
3rd year: euros per student (1534)

TEACHING ASSISTANSHIP: (availability of funding in recognition of supporting teaching activities by the PhD student)
There are various forms of financial aid for activities of support to the teaching practice. The PhD
student is encouraged to take part in these activities, within the limits allowed by the regulations.

COMPUTER AVAILABILITY:
1st year: individual use
2nd year: individual use
3rd year: individual use

DESK AVAILABILITY:
1st year: individual use
2nd year: individual use
3rd year: individual use