



# PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 40th cycle

Research Area n. 3 - Systems and Control

**PNRR 630 Research Field: DEVELOPMENT OF SYSTEMS AND ALGORITHMS FOR  
AUTONOMOUS DRIVING ON SUBURBAN AND HIGHWAY ROADS**

<b>Monthly net income of PhDscholarship (max 36 months)</b>
<b>€ 1500.0</b>
In case of a change of the welfare rates during the three-year period, the amount could be modified.

<b>Context of the research activity</b>	
<b>Motivation and objectives of the research in this field</b>	The autonomous-driving technology will be the next revolution in mobility, both in urban and in suburban/highway context. The objective of this research is to focus on the development of methods and algorithms for the autonomous driving on highways and suburban conditions. The use cases that will be taken as references are the automatic scanning of the roads with an autonomous or semi-autonomous (level 3) vehicle, and the mobility-as-a-service mobility model (assuming some level of sharing of the cars)The research aims to to develop at least one working prototype, capable of experimental development on the technology on public roads.
<b>Methods and techniques that will be developed and used to carry out the research</b>	The research will follow this path: <ul style="list-style-type: none"> <li>- Review and assessment of the reference literature and available design/experimental data.</li> <li>- Development of control strategies and algorithms.</li> <li>- Validation of different case studies in simulation.</li> <li>- Elaboration of Papers/Articles to be published in the appropriate Journals.</li> </ul>
<b>Educational objectives</b>	The Ph.D. candidate will learn the principles of control of autonomous vehicles (including perception, localization,



	<p>planning, motion-control)</p> <ul style="list-style-type: none"> <li>- Applying knowledge and understanding. The Ph.D. candidate will be able to apply autonomous-vehicles control systems to different case studies</li> <li>- Critical assessments. The Ph.D. candidate will learn how to identify crucial aspect of autonomous cars</li> <li>- Communication: the PhD Candidate will learn how to communicate the results of the Ph.D. research presenting results analysis in a scientific context and policy brief to decision-makers.</li> </ul>
<b>Job opportunities</b>	This research activity will qualify the candidate for future academic and research positions, as well as for a highly qualified professional career in industries or organizations.
<b>Composition of the research group</b>	<p>3 Full Professors                  2 Associated Professors                  4 Assistant Professors                  30 PhD Students</p>
<b>Name of the research directors</b>	Prof. Sergio Savaresi

<b>Contacts</b>	
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<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	750.0 €
<b>By number of months</b>	6

<b>National Operational Program for Research and Innovation</b>
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<b>Company where the candidate will attend the stage (name and brief description)</b>	Autostrade per L'Italia - Italia
<b>By number of months at the company</b>	6
<b>Institution or company where the candidate will spend the period abroad (name and brief description)</b>	College of Engineering Electrical & Computer Engineering Michigan State University - USA
<b>By number of months abroad</b>	6

<b>Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information</b>
<p><u>EDUCATIONAL ACTIVITIES</u> (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student.</p> <p><u>TEACHING ASSISTANTSHIP:</u> 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.</p> <p><u>COMPUTER AVAILABILITY:</u>                  1st year: Yes                  2nd year: Yes                  3rd year: Yes</p>