



PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 39th cycle

Research Area n. 4 - Telecommunications

THEMATIC Research Field: AIR TRAFFIC MONITORING AND TRACKING

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0
In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
<p>Motivation and objectives of the research in this field</p>	<p>The focus of the research is the design of localization infrastructures and algorithms to augment the performance of aircraft monitoring and tracking during the critical phases of landing and departure.</p> <p>Localization technologies currently used in airports rely on local and wide area multi-lateration (WAM) systems. These, however, suffer from limitations due to the inability to resolve multipath ambiguities, the lack of optimization strategies for ground stations' selection, calibration issues and limited coverage.</p> <p>The PhD research aims at the development of enhanced solutions to overcome such limitations, by extending the system coverage in areas such as open sea and mountain areas, allowing to offer a service where now it is not possible.</p> <p>To achieve this goal, the research will analyze hybrid WAM systems, where satellite stations are integrated with the ground stations, as well as where ground-based sensing technology (i.e., radar) is integrated with Automatic Dependent Surveillance - Broadcast (ADS-B) messages.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>The research project will investigate both from a theoretical and experimental (i.e., with numerical simulations) point of view the development of hybrid WAM systems, involving:</p>



	<ul style="list-style-type: none"> • study and modelling of current localization solutions available for aircraft monitoring; • development of novel localization algorithms for hybrid WAM systems; • assessment of the algorithm performance and comparison with baseline solutions currently available for aircraft localization. <p>The research will be carried out within the IoT Lab research group, in cooperation with Thales Italia.</p>
Educational objectives	<p>Develop competences on innovative components Multi-disciplinary competencies Methodological competences at both the theoretical and applied level Problem setting and solving capabilities Develop team-working attitude.</p>
Job opportunities	<p>Future job opportunities include automotive industry and in particular:</p> <ul style="list-style-type: none"> • Aerospace and avionics • Mobility • Air traffic management • Localization systems. <p>Besides this, job opportunities comprise national and international academic and non-academic institutions and organizations, engaged in innovation, research and technical development.</p>
Composition of the research group	<p>0 Full Professors 1 Associated Professors 1 Assistant Professors 0 PhD Students</p>
Name of the research directors	<p>Prof. Monica Nicoli Prof. Mattia Brambilla</p>

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



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

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

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

The visiting period abroad will be in an international headquarter of Thales Group.

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.

TEACHING ASSISTANTSHIP: (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: individual use

DESK AVAILABILITY: individual use