



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

Research Area n. 2 - Electronics

**THEMATIC Research Field: INVESTIGATION OF HIGH-END INERTIAL SENSORS THROUGH
ADVANCED ALLAN VARIANCE ANALYSES**

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

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

MEMS sensors are pervasive in the consumer and automotive field. In some high-end applications, like space navigation, their performances are still behind systems based on other technologies. However, the cost of the latter is becoming the bottleneck of modern inertial navigation systems. For this reason, the development of next-generation MEMS sensors cannot be postponed any longer. Investigation of the long-term stability issues through the Allan variance becomes mandatory

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

On one side, innovative working principles will be exploited to enhance sensors stability under various environmental conditions, and thus offset drifts associated to such phenomena. On the other side, innovative electronic blocks will also be considered building up on previous researches carried on with the company financing this PhD (ST Microelectronics). A deep study will finally concern the investigation of the impact of various nonidealities on the Allan variance.

Educational objectives

Approach to the design of sensors, and more in general of architectures where a sensor is coupled to sustaining and readout circuits. The PhD should be capable, at the end of the research, to manage the design phase from specs and technological constraints to the final design.



Job opportunities	Given the more and more relevant impact of miniaturized sensors and actuators in our everyday life (IoT, autonomous driving, smart cities/factories/ health), the job opportunities after the PhD include industrial R&D positions, similar positions in research centres, and the academic career (RTD-A). All these positions can be offered by Italian or foreign companies or institutions.
Composition of the research group	0 Full Professors 1 Associated Professors 0 Assistant Professors 2 PhD Students
Name of the research directors	Giacomo Langfelder

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
<p>Number of industrial members in the team: 2</p> <p>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.</p> <p>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.</p> <p>COMPUTER AVAILABILITY: individual use</p>



DESK AVAILABILITY: individual use