POLITECNICO DI MILANO

PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 41st cycle

Research Area n. 2 - Electronics

THEMATIC Research Field: INVESTIGATION OF DRAM DATA RETENTION

Monthly net income of PhDscholarship (max 36 months)
1700.0 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	The DRAM technology is among the most successful semiconductor technologies ever existed. Its success stems from its relentless evolution in terms of cell dimensions, geometry, and materials. Technology evolution, however, also results in more severe reliability issues to face. Among them, those impacting cell data retention are likely the most critical and may put at risk the success of the technology in the years to come. Research on data retention in DRAM cells is then of utmost importance. The Ph.D. program aims to investigate data retention in DRAM cells from a statistical perspective, considering its main dependences, variability, and instability over array lifetime. The results will support the development of future DRAM technologies, providing hints to mitigate the reliability issues coming from cell data retention.
Methods and techniques that will be developed and used to carry out the research	The research will require both experimental and modeling activities, which will be carried out at the Politecnico di Milano and in the labs of a leading company in the field. Experimental activities will involve electrical tests specifically designed to statistically address data retention in DRAM cells. Modeling activities will involve the development of Monte Carlo simulation tools to reproduce

	the experimental evidence.
Educational objectives	The research aims to make the candidate develop solid skills and expertise in the field of semiconductor technologies, with emphasis on the DRAM technology. The candidate will get familiar with the electrical testing of high-density memory arrays, statistical analyses, the development of physics-based models to reproduce the experimental evidence. At the end of the Ph.D. program the candidate will be a professional able to take up a successful career in the field of microelectronics.
Job opportunities	Highly-qualified positions in the most relevant semiconductor companies and research centers in the world.
Composition of the research group	2 Full Professors 0 Associated Professors 1 Assistant Professors 6 PhD Students
Name of the research directors	Prof. Christian Monzio Compagnoni

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

Scholarship Increase for a period abroad	
Amount monthly	850.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences). 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:
1st year: Yes
2nd year: Yes
3rd year: Yes

DESK AVAILABILITY:
1st year: Yes
2nd year: Yes
3rd year: Yes