POLITECNICO DI MILANO

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

Research Area n. 1 - Computer Science and Engineering

THEMATIC Research Field: AI-DRIVEN ANALOG CIRCUIT DESIGN

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	While analog integrated circuits (ICs) are critical in a wide range of modern electronics applications, including telecommunications, power electronics, audio engineering, biomedical engineering, and instrumentation the analog design flow is mainly a manual process carried out by expert engineers which requires several iterations with the risk of delivering sub-optimal products. In addition, the large adoption of commercial closed-source CAD framework to design analog circuit hinders the design, implementation, and adoption of novel CAD methodologies. In this scenario, seminal works demonstrated the potential benefits of AI-driven heuristics to design analog circuits while most of the open-source analog frameworks still leverage the traditional algorithmic approach. Thus, the design of complete AI-driven methodologies to help the design, verification, and optimization of the different stages in the analog design process is still an open research question. The PhD scholarship will support the investigation of AI-driven methodologies to create innovative analog design frameworks supported by open-source CAD tools. The emphasis of the research will be on automatic test generation as well as layout and sizing optimizations.
Methods and techniques that will be developed and used to carry out the	Design methodologies for optimal design of analog and

research	mixed-signal circuits. The research envisions the development of novel AI-driven methodological approaches to support the entire analog and mixed-signal design flow.
Educational objectives	The student will acquire strong skills in applied AI with emphasis on CAD tools and hardware design (Verilog SystemVerilog, TCL, Spice). Additional skills will be acquired in the domain of AI (PyTorch) and software engineering using C/C++ and Python programming languages to design and integrate complex software into commercial and opensource CAD tools.
Job opportunities	Recent graduates in this research area have been hired by major semiconductor and IT companies. Post-doc research opportunities are also available. Cooperation with other academic institutions and start-up at PoliMI can open additional job opportunities.
Composition of the research group	0 Full Professors 7 Associated Professors 6 Assistant Professors 7 PhD Students
Name of the research directors	Prof. Davide Zoni

Contacts
davide.zoni@polimi.it https://zoni.faculty.polimi.it

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	700.0 €
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): 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:
1st year: Yes
2nd year: Yes
3rd year: Yes

Progetto “OCTOPUS - Automatic layout of analog mixed-signal circuits encompassing re-targeting and post-layout optimizations”, codice identificativo FISA-2024-00333
Decreto Direttoriale del 18 luglio 2024, n. 1075 di emanazione di un “Avviso per la presentazione di proposte progettuali a valere sul Fondo italiano per le scienze applicate”;
Decreto Dirigenziale n. 15723 del 07-10-2025 Avviso FISA 2024 - Approvazione della lista delle proposte ammissibili al finanziamento
CUP D53C25002020001