MIRELAI

PhD position 5: Physics-informed machine learning for simulations of semiconductor devices

Employers

Prof. Willem van Driel from Delft University of Technology in Delft, the Netherlands and Mr. Jakko Nieuwenkamp from Reden B.V in Hengelo, the Netherlands are looking for a PhD candidate to join a three-year research training within the EU-funded MCSA industrial doctorate MIRELAI. You will be enrolled in the PhD programme of Delft University of Technology and and supervised by Prof. Willem van Driel (TU Delft) and Prof. Guo Qi Zhang (TU Delft).

Project description

- Development of a physics-informed machine learning (ML) modelling strategy fulfilling the following key aspects: 1) Establish ML technology for semiconductor devices to explore massive design spaces, identify multi- dimensional correlations and manage ill- posed problems. 2) Design specialized network architectures that automatically satisfy some of the physical invariants for better accuracy, faster training and improved generalization. 3) Consider differences and variances in user profiles/application conditions.
- Application of the digital twin to a use case defined with the partners Nexperia and Bosch to monitor the health of the electrical components based on a combination of physics-based models and sensor data.

International mobility

As a PhD candidate, you will be employed for 18 months each by TU Delft and Reden. During the placement at TU Delft, you will also undertake a 1-month placement at IMEC, supervised by Dr. Bart Vandevelde.

Requirements

Specific Eligibility Criteria on the Horizon Europe: Marie Skłodowska-Curie (MSCA) programme apply, including the mobility rule and PhD rules. Applicants of any nationality are welcome.

Additional requirements

- Master's degree in science, electrical/mechanical engineering, physics, mathematics
- Background in FE-simulations (e.g., Abaqus or Comsol), and programming (e.g., Matlab, Python)
- English proficiency: Toefl-IBT test >100 points or IELTS test >7,0

The monthly support and benefits

- The successful candidate will benefit from an international scientific network of academic and industrial partners with research excellence in microelectronics reliability based on experimental characterization, simulation, and data-driven approaches
- Flexible working hours and part-time home office
- Personalised career development plans will be established to support the needs of the PhD candidate
- The PhD candidate will receive an attractive salary in accordance with the MSCA regulations. The financial package will include: 1) Living allowance of €3,400 (country correction coefficient applies), 2) Mobility allowance of €600, 3) Family allowance (€660), if applicable. The exact (net) salary will be confirmed upon appointment and is dependent on local tax, social and health insurance regulations and on the country correction factor and be subjected to deductions for employment costs.

Application

Required documents:	Complete applications in English should include: · CV* and copy of diploma · Letter of motivation and letter of recommendation · English language proficiency certificate(s) (not for native speakers)
Selection process:	· Our selection procedure for PhD position is open, transparent, merit-based and in line with the principles set out in the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers · The application dossier needs to be submitted as a single PDF file to w.d.vandriel-1@tudelft.nl by 31-10-2022. Please indicate by: 'MIRELAI: **PhD position 05** - your name' · Pre-selected candidates will be invited for interviews by 15-11-2022. Unsuccessful applicants will not receive any notification
Application deadline:	31-10-2022
Expected start date:	The individual PhD project is set to start between 01-01-2023 and 01-04-2023
Contact person for enquiries:	Prof. Dr. Ir. W.D. van Driel Email address: w.d.vandriel-1@tudelft.nl Phone: +31 6 50 123153

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Engineering and Physical Sciences Research Council

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* The CV must be signed by the candidate and has to bear the following sentence concerning the management of candidate's personal data: *"The undersigned Name and Surname authorizes the management of his/her personal data contained in the application documents as foreseen by the European Regulation 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and declares to be aware of the rights of the data subject as listed in Chapter III of the aforementioned European Regulation".*

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