PhD on the topic: Secure neuromorphic architectures

The REACT MSCA DN Project: Self-awareness in humans is an innate capability, arising from the brain's ability to process a multitude of sensory inputs. Emulating this functionality in electronic systems—commonly referred to as neuromorphic computing—holds the potential to create highly intelligent machines capable of supporting a wide range of everyday applications, from autonomous vehicles to smart navigation systems. However, realizing neuromorphic computing in practice presents significant challenges, particularly in the areas of energy efficiency, reliability, and security.

The REACT MSCA Doctoral Network addresses these challenges by developing a neuromorphic platform that is inherently self-aware in terms of energy consumption, secure operation, and system reliability. As part of this initiative, 15 early-stage doctoral candidates (DCs) will be trained through a comprehensive, interdisciplinary program spanning material science, device physics, computer architecture, hardware prototyping, compiler design, simulation and emulation tools, as well as cybersecurity, reliability, and system verifiability.

REACT offers a uniquely structured training environment, combining academic excellence with industrial collaboration. DCs will benefit from close mentorship by leading researchers and industry experts, while also developing essential skills in scientific writing, research ethics, time management, and entrepreneurship.

By the conclusion of the REACT project, participants will be well-equipped to pursue impactful careers across academia and industry, with the REACT program serving as a strong foundation for their future success.

Organization:

Founded in 1614, the University of Groningen enjoys an international reputation as a dynamic and innovative institution of higher education, offering high-quality teaching and research. Flexible study programmes and academic career opportunities in a wide variety of disciplines encourage the 34,000 students and researchers alike to develop their own individual talents. As one of the best research universities in Europe, the University of Groningen has joined forces with other top universities and networks worldwide to become a truly global center of knowledge. Within the Faculty of Science and Engineering, a 4-year interdisciplinary PhD position is available at the Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence. The candidate will become a member of Dr. Farhad Merchant's Research Group working on Innovative Computer Architectures and Hardware Security, and will be supervised by Dr Farhad Merchant. The candidate will be part of the CogniGron center, a multidisciplinary initiative on neuromorphic computing. The position is funded by MSCA DN for 36 months and the remaining 12 months will be covered by other funding sources. The candidate is expected to undertake secondment(s) during the first three years of the project.

Qualification & Eligibility:

- Mobility Rule: Candidates must not have resided or carried out their main activity in "**host country**" for more than 12 months in the 3 years immediately before the recruitment date.
- PhD Rule: Applicants must not already possess a doctoral degree at the date of recruitment.
- Master degree or equivalent in Electrical Engineering, Computer Science, or related field with excellent grades.
- Sound knowledge of computer hardware design and synthesis tools (ASIC, FPGA).
- Good programming and scripting skills.
- Excellent English communication, presentation, and writing skills.
- Must be a team player.
- Knowledge of hardware security is an added advantage.
- Knowledge of computing-in-memory is an added advantage.
- Knowledge of emerging non-volatile memory technologies is an added advantage.

Conditions of employment:

We offer you in accordance with the Collective Labour Agreement for **Dutch Universities**:

- A salary of € 2,770 (salary scale PhD candidates) gross per month in the first year, up to a maximum of € 3,539 gross per month in the fourth and final year, based on a full-time position.
- A holiday allowance of 8% gross annual income and an 8.3% year-end bonus.
- A temporary position of one year with the option of renewal for another three years; prolongation of the contract is contingent on sufficient progress in the first year to indicate that you will successfully complete your PhD thesis within the next three years. A PhD training programme is part of the agreement.
- **Intended start date:** November 1, 2025

Application:

Please submit the following material, concatenated in a single PDF file and upload this file as your 'CV' by means of the application form at Vacancies – project-react.eu.

- A cover letter motivating your application and detailing the motivation to apply for this specific PhD project (1 page max).
- An academic CV.
- A research statement (2 pages max) describing your personal research interests and previous research projects.
- A certified list of grades from your undergraduate degree(s) up to the moment of application (in case your MSc degree has not yet been awarded).
- The names and e-mail addresses of 2 academic referees who are willing and able to write recommendation letters for you, including the supervisor of your MSc research project.

You may apply for this position until 31 October 11:59pm / before 1st November 2025 Dutch local time (CET) by means of the project website Vacancies – project-react.eu Applications will be evaluated as received.

The University of Groningen strives to be a university in which students and staff are respected and feel at home, regardless of differences in background, experiences, perspectives, and identities. We believe that working on our core values of inclusion and equality are a joint responsibility and we are constructively working on creating a socially safe environment. Diversity among students and staff members enriches academic debate and contributes to the quality of our teaching and research. We

therefore invite applicants from underrepresented groups in particular to apply. For more information, see also our diversity policy webpage: https://www.rug.nl/(...)rsity-and-inclusion/

Our selection procedure follows the guidelines of the Recruitment code (NVP): https://www.nvp-hrnetwerk.nl/nl/sollicitatiecode and European Commission's European Code of Conduct for recruitment of researchers: https://euraxess.ec.europa.eu/jobs/charter/code

We provide career services for partners of new faculty members moving to Groningen.

Unsolicited marketing is not appreciated.

Information

For information you can contact:

- Dr Farhad Merchant, f.a.merchant@rug.nl

Please do not use the e-mail address(es) above for applications.