Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Design Space Exploration and Optimisation for AI/ML-enabled Systems

Funded 4-Year PhD Position
School of Computer Science and Statistics
Trinity College Dublin
https://www.scss.tcd.ie/

Motivation. Modern AI/ML-enabled Software Systems, consisting of multiple AI/ML components and related traditional software components, face numerous engineering challenges beyond the basic performance of single AI/ML components. When designing such systems and the related AI/ML pipelines, engineers have to deal with a large number of design decisions balancing multiple competing objectives, e.g., performance, robustness, and more complex goals like user experience, explainability, and trustworthiness. This creates a complex design space that needs systematic exploration and optimization approaches.

Focus. The successful candidate for this position will investigate novel approaches to design space exploration and optimization for AI/ML-enabled systems. The research will focus on developing methods and tools to help engineers make better design decisions when building and improving complex AI/ML-enabled systems, considering multiple competing objectives. Of particular interest are approaches that provide automatic and interactive tool support to deal with the whole configuration space as a whole.

Position. This is a funded 4-year PhD position and includes:

- an annual stipend of €22,000 (for 4 years), and
- fees to pursue a PhD in Computer Science (for 4 years, at the fee level charged to EU students).

Requirements.

Mandatory

- Bachelor's degree (minimum II.1 honours grade or equivalent) in computer science, computer engineering, or a closely related discipline.

Desirable/Advantageous

- Master's degree in a relevant field
- Experience with machine learning or AI
- Experience with optimisation, search-based approaches, variability modelling, software product lines
- Interest in the development of automated and interactive tools
- Candidates should be self-motivated with a proven ability to work independently and as part of a team.

SCSS and Trinity College. The successful candidate will join the structured PhD programme in the School of Computer Science and Statistics at Trinity College Dublin, working with a vibrant community of over 150 PhD students. TCD is the top-ranked academic institution in Ireland and one of the leading institutions in Europe for the study of computer science.

Application Instructions.

Submit a single PDF document including:

- A cover letter (one page) addressing
  - Your motivation for applying for the position
  - How your background makes you a suitable candidate for the project
  - Your research interests
- Your curriculum vitae
- Names and contact details of two academic referees

Applications and informal queries about the position can be submitted **via email to Goetz Botterweck (botterwg@tcd.ie)** with the subject "**PHD-DSEAI**".

Suitably qualified applicants will be interviewed on a rolling basis, with a **deadline of 31 January 2025** for applicants who wish to begin before September 2025.