
**12th INTERNATIONAL SCHOOL ON DEEP LEARNING
(with a special focus on Large Language Models, Foundation Models and
Generative AI)**

DeepLearn 2025

Porto – Maia, Portugal

July 21-25, 2025

<https://deeplearn.irdta.eu/2025/>

Co-organized by:

University of Maia

Institute for Research Development, Training and Advice – IRDTA
Brussels/London

Early registration: October 28, 2024

SCOPE:

DeepLearn 2025 will be a research training event with a global scope aiming at updating participants on the most recent advances in the critical and fast developing area of deep learning. Previous events were held in Bilbao, Genova, Warsaw, Las Palmas de Gran Canaria, Guimarães, Las Palmas de Gran Canaria, Luleå, Bournemouth, Bari, Las Palmas de Gran Canaria and Porto.

Deep learning is a branch of artificial intelligence covering a spectrum of current frontier research and industrial innovation that provides more efficient algorithms to deal with large-scale data in a huge variety of environments: computer vision, neurosciences, speech recognition, language processing, human-computer interaction, drug discovery, biomedicine and health informatics, medical image analysis, recommender systems, advertising, fraud detection, robotics, games, business and finance, biotechnology, physics experiments, biometrics, communications, climate sciences, geographic information systems, signal processing, genomics, materials design, video technology, social systems, earth and sustainability, etc. etc.

The field is also raising a number of relevant questions about robustness of the algorithms, explainability, transparency, interpretability, as well as important ethical

concerns at the frontier of current knowledge that deserve careful multidisciplinary discussion.

Most deep learning subareas will be displayed, and main challenges identified through 18 four-hour and a half courses, 2 keynote lectures, 1 round table and a hackathon competition among participants. Renowned academics and industry pioneers will lecture and share their views with the audience. The organizers are convinced that outstanding speakers will attract the brightest and most motivated students. Face to face interaction and networking will be main ingredients of the event. It will be also possible to fully participate in vivo remotely.

DeepLearn 2025 will place special emphasis on large language models, foundation models and generative artificial intelligence.

ADDRESSED TO:

Graduate students, postgraduate students and industry practitioners will be typical profiles of participants. However, there are no formal pre-requisites for attendance in terms of academic degrees, so people less or more advanced in their career will be welcome as well.

Since there will be a variety of levels, specific knowledge background may be assumed for some of the courses.

Overall, DeepLearn 2025 is addressed to students, researchers and practitioners who want to keep themselves updated about recent developments and future trends. All will surely find it fruitful to listen to and discuss with major researchers, industry leaders and innovators.

VENUE:

DeepLearn 2025 will take place in Porto, the second largest city in Portugal, recognized by UNESCO in 1996 as a World Heritage Site. The venue will be:

University of Maia
Avenida Carlos de Oliveira Campos - Castelo da Maia
4475-690 Maia
Porto, Portugal

<https://www.umaia.pt/en>

STRUCTURE:

3 courses will run in parallel during the whole event. Participants will be able to freely choose the courses they wish to attend as well as to move from one to another.

All lectures will be videorecorded. Participants will be able to watch them again for 45 days after the event.

An open session will give participants the opportunity to present their own work in progress in 5 minutes. Also companies will be able to present their technical developments for 10 minutes.

The school will include a hackathon, where participants will be able to work in teams to tackle several machine learning challenges.

Full live online participation will be possible. The organizers highlight, however, the importance of face to face interaction and networking in this kind of research training event.

KEYNOTE SPEAKERS:

Yonina Eldar (Weizmann institute of Science), Model Based AI and Applications

Manuela Veloso (JPMorganChase), AI, Humans, and Robots for Task Solving

PROFESSORS AND COURSES: (to be completed)

Pierre Baldi (University of California Irvine), [intermediate/advanced] From Deep Learning and Transformers to AI Risks and Safety

Sean Benson (Amsterdam University Medical Center), [intermediate] Digital Twins and Generative AI for Personalised Medicine

Mark Derdzinski (Dexcom), [introductory] From Prototype to Production: Evaluation Strategies for Agentic Applications

Samira Ebrahimi Kahou (University of Calgary), [intermediate/advanced] Explainability in Machine Learning

Elena Giusarma (Michigan Technological University), [introductory/intermediate] Machine Learning at the Frontier of Astrophysics: Simulating the Universe

Xia "Ben" Hu (Rice University), [introductory/advanced] Efficient LLM Serving: Algorithms, Systems and Applications

Jayashree Kalpathy-Cramer (University of Colorado), [introductory/intermediate] Multimodal AI for Healthcare

Yingbin Liang (Ohio State University), [intermediate/advanced] Theory on Training Dynamics of Transformers

Chen Change Loy (Nanyang Technological University), [intermediate/advanced] Harnessing Prior for Content Enhancement and Creation

Preslav Nakov (Mohamed bin Zayed University of Artificial Intelligence), tba

Evan Shelhamer (DeepMind), [intermediate] Test-Time Adaptation for Updating Models on New and Different Data

Atlas Wang (University of Texas Austin), [intermediate] Low Rank Strikes Back in the Era of Large Language Models

Xiang Wang (University of Science and Technology of China), [advanced] Large Language Models for User Behavior Modeling: Cross-Modal Interpretation, Preference Optimization, and Agentic Simulation

Rex Ying (Yale University), [intermediate/advanced] Multimodal Foundation Models for Graph-Structured Data: Framework and Scientific Applications

OPEN SESSION:

An open session will collect 5-minute voluntary oral presentations of work in progress by participants.

They should submit a half-page abstract containing the title, authors, and summary of the research to david@irdta.eu by July 13, 2025.

INDUSTRIAL SESSION:

A session will be devoted to 10-minute demonstrations of practical applications of deep learning in industry.

Companies interested in contributing are welcome to submit a 1-page abstract containing the program of the demonstration and the logistics needed. People in charge of the demonstration must register for the event.

Expressions of interest have to be submitted to david@irdta.eu by July 13, 2025.

HACKATHON:

A hackathon will take place, where participants can work in teams to tackle several machine learning challenges. They will be coordinated by Professor Sergei V. Gleyzer (University of Alabama). The challenges will be released 2 weeks before the beginning of the school. A jury will judge the submissions and the winners of each challenge will be announced by August 25, 2025. The winning teams will receive a modest monetary prize and the runners-up will get a certificate.

SPONSORS:

Companies/institutions/organizations willing to be sponsors of the event can download the sponsorship leaflet from

<https://deeplearn.irdta.eu/2025/sponsoring/>

ORGANIZING COMMITTEE:

Sergei V. Gleyzer (Tuscaloosa, hackathon chair)
José Paulo Marques dos Santos (Maia, local chair)
Carlos Martín-Vide (Tarragona, program chair)
Sara Morales (Brussels)
José Luís Reis (Maia)
Luís Paulo Reis (Porto)
David Silva (London, organization chair)

REGISTRATION:

It has to be done at

<https://deeplearn.irdta.eu/2025/registration/>

The selection of 6 courses requested in the registration template is only tentative and non-binding. For logistical reasons, it will be helpful to have an estimation of the respective demand for each course.

Since the capacity of the venue is limited, registration requests will be processed on a first come first served basis. The registration period will be closed and the on-line registration tool disabled when the capacity of the venue will have got exhausted. It is highly recommended to register prior to the event.

FEES:

Fees comprise access to all program activities and lunches.

There are several early registration deadlines. Fees depend on the registration deadline.

The fees for on site and for online participation are the same.

ACCOMMODATION:

Accommodation suggestions will be available in due time at

<https://deeplearn.irdta.eu/2025/accommodation/>

CERTIFICATE:

A certificate of successful participation in the event will be delivered indicating the number of hours of academic activities. This should be sufficient for those participants who plan to request ECTS recognition from their home university.

QUESTIONS AND FURTHER INFORMATION:

david@irdta.eu

ACKNOWLEDGMENTS:

Universidade da Maia

Universidade do Porto

Universitat Rovira i Virgili

Institute for Research Development, Training and Advice – IRDTA, Brussels/London