

8th Advanced Course on Data science & machine Learning – ACDL 2025

from Deep Learning to Generative Artificial Intelligence

Riva del Sole Resort & SPA – Castiglione della Pescaia (Grosseto) Tuscany, Italy

9 – 13 June 2025

<https://acdl2025.icas.events/>

lod@icas.cc

Schedule Ver. 1.5 (4 pages) – April 11, 2025

	Mon, 9 June	Tue, 10 June	Wed, 11 June	Thu, 12 June	Fri, 13 June
09:00 – 09:50	Lecture	Lecture	Lecture	Free time	Lecture
09:50 – 10:40	Lecture	Lecture	Lecture		Lecture
10:40 – 11:20	Coffee break	Coffee break	Coffee break		Coffee break
11:20 – 12:10	Lecture	Lecture	Lecture		Lecture
12:10 – 13:00	Lecture	Lecture	Lecture		Lecture
13:00 – 15:00	Lunch	Lunch	Lunch	Lunch	Lunch
15:00 – 15:50	Lecture	Free time	Lecture	Lecture	Lecture
15:50 – 16:40	Lecture		Lecture	Lecture	Lecture
16:40 – 17:20	Coffee break		Coffee break	Coffee break	Pause
17:20 – 18:10	Lecture		Lecture	Lecture	Lecture
18:10 – 19:00	Lecture		Lecture	Lecture	Lecture
19:00 – 19:50				Lecture	
20:00	Dinner	Dinner	Dinner	Dinner	Social Dinner*
		21:30 Poster Session 1		21:30 Poster Session 2	

8th Advanced Course on Data Science & Machine Learning

*From Deep Learning to
Generative Artificial Intelligence*

Lecturers

Sanjeev Arora / Princeton University & Institute for Advanced Study, USA
 Antoine Bosselut / EPFL, Switzerland
 Sander Dieleman / Google DeepMind, London, UK
 Caglar Gulcehre / EPFL, Switzerland
 Tatsu Hashimoto / Stanford University & Institute for Human-Centered Artificial Intelligence, USA
 Thomas Hofmann / ETH Zurich, Switzerland
 Subbarao Kambhampati / Arizona State University, USA
 Joel Z. Leibo / Google DeepMind London & The Alan Turing Institute, UK
 Lei Li / Language Technology Institute - Carnegie Mellon University, USA
 Panos Pardalos / University of Florida, USA
 Bryan Perozzi / Google Research, New York, USA
 Raniero Romagnoli / Almwave, Italy
 Liubov Tupikina / Bell Labs Paris, France

Directors
 Giuseppe Nicosia / University of Catania, Italy
 Panos Pardalos / University of Florida, USA

Riva del Sole Resort & SPA - Tuscany - Italy
June 9-13, 2025

icas.events acdl2025.icas.events
acdl@icas.events

ACDL 2025 Lectures

Sanjeev Arora, Princeton University & Institute for Advanced Study, USA

Lecture 1/3 “Just a stochastic parrot? How LLMs Learn, Reason, and Self-Improve”

Lecture 2/3 “A Skill-based view of LLM capabilities and their emergence”

Lecture 3/3 “LLM Metacognition: Eliciting and Leveraging LLMs’ “Thinking about Thinking” ”

Sander Dieleman, Google DeepMind London, UK

Lecture 1/3 “Diffusion models: Intuition and Perspectives”

Lecture 2/3 “Diffusion models: Guidance, Distillation and Advanced Topics”

Lecture 3/3 “How to Train Neural Nets Effectively”

Caglar Gulcehre, EPFL, Switzerland

Lecture 1/3 “Fine-Tuning Language Models”

Lecture 2/3 “Reinforcement Learning for Language Models”

Lecture 3/3 “Applications: Alignment for Safety and Reasoning for Scientific Discovery”

Tatsu Hashimoto, Stanford University & Institute for Human-Centered Artificial Intelligence, USA

Lecture 1/3 “Transformer Architectures”

Lecture 2/3 “Language Models Pre-Training and Scaling – I”

Lecture 3/3 “Language Models Pre-Training and Scaling – II”

Subbarao Kambhampati, Arizona State University, USA

3 Lectures on “Reasoning and Planning Abilities of the Large Language Models”

Joel Z. Leibo, Google DeepMind London & The Alan Turing Institute, UK

Lecture 1/3 “Multi-Agent Deep Reinforcement Learning”

Lecture 2/3 “Cooperative AI”

Lecture 3/3 “Generative Agents”

Lei Li, Language Technology Institute - Carnegie Mellon University, USA

Lecture 1/5 “Scalable Post-Training Optimization for Large Language Models”

Lecture 2/5 “Scaling Strategic Reasoning for Large Language Models”

Lecture 3/5 “The Science of Evaluation for Large Language Models”

Lecture 4/5 “Accelerating Transformer Language Models on GPUs”

Lecture 5/5 “Real-time Simultaneous Translation of Unbounded Streaming Speech” TBC

Panos Pardalos, University of Florida, USA

Lecture TBA

Topics: Data Science, Global Optimization, Mathematical Modelling, AI

Bryan Perozzi, Google Research, New York, USA

Lecture 1/3 “Learning on Graphs: The Essentials”

Lecture 2/3 “Challenges of using Graph Neural Networks”

Lecture 3/3 “Graph Reasoning with Large Language Models”

Raniero Romagnoli, Almapwave, Italy

Lecture TBA

Topics: Large Language Models, Foundation Models, AI, NLP

Liubov Tupikina, Bell Labs Paris, France

Lecture “On some Challenges of Embeddings Theory”

Useful Information

Conference Room: *The Crown* (in the conference centre of the Riva del Sole Resort & SPA)

Registration: *June 8 @ 16:00 – 19:30* (in the foyer of the conference centre near The Crown conference room)
Inside the Riva del Sole it is mandatory to wear the badge.

Group Photo: *Monday June 9 @ 13:00 Meeting point: terrace adjacent to the restaurant.*

Certificates will be given out on the last day of the course.

* For the *social dinner on the 13th*, if possible, we advise everyone **to dress up** (jacket and tie, suit, etc.).

1. **Very Important:** *during lessons and Q&A sessions, absolute silence is recommended, you must not make noise, you must not disturb the Lecturer during the lesson or while she/he is answering questions posed by the audience.*
2. Conference Room: **The Crown**. Number 7 on the resort map.
3. **Registration:** *June 8 @ 15:30 – 19:30* (in the foyer of the conference centre near The Crown conference room). Inside the Riva del Sole it is mandatory to wear the badge.
4. **Group Photo:** *June 9 @ 13:00 Meeting point: terrace adjacent to the restaurant.*
5. **Resort Map, Castiglione della Pescaia Map,** and **ACDL 2025 Poster.**
6. In the program you will find the list of **accepted posters**. The **Poster Session 1** will be held on **Tue, June 10 @ 21:30** **Poster Session 2** will be held on **Thu, 12 June @ 21:30**. The two Poster Sessions will be held in the **Da Vinci Conference Room** (first floor of the Congress Centre, number 6 on the resort map). *Those who have problems and cannot make the poster, please send us an email now, deadline by June 2nd.*
 - a. We recommend preparing and printing a poster of **size B0** (1000 × 1414 mm or 39.4 × 55.7 inches) in VERTICAL orientation on the board (avoid landscape orientation). If for some reason the B0 size is not possible, then use the A0 size (841 mm x 1189 mm, or 33.1 inches x 46.8 inches).
 - b. **It is not possible to print posters at the course venue. When you arrive at the course venue the posters must already be printed.**
 - c. The Conference Organisers will provide all necessary supplies for mounting the posters (tape, etc).
 - d. *The poster boards will be ready each morning from 08:45.* All presenters are asked to hang their posters as soon as possible in the same morning of their assigned poster session. This way all delegates will be able to study them ahead of the poster session and come prepared with specific questions. Presenters are also asked to remove their posters at the end of the session. Any poster left unattended on its poster boards after the poster session will be removed.
7. Obviously, *we recommend bringing your work laptop/tablet.*
8. Participants who need to take an **exam/project/oral to have the 8 ECTS** credited are asked to email acdl@icas.cc and Prof. Nicosia giuseppe.nicosia.1@gmail.com **Please read the FAQ section “ETCS Credits Recognition”**
9. Inside Riva del Sole, **badges must be worn at all times.**
10. *For dinner on the 13th, if possible, we advise everyone to dress up (jacket and tie, suit, etc.).*
11. **Certificates** will be given out on the last day of the course. To receive the certificate you must have at least 85% of class attendance (we have CNNs/Transformers to compute and infer attendance ;-).
12. One last thing do not forget bathing suits, sunscreen, and stay hydrated.

“But don't you see that the whole trouble lies here? In words, words. Each one of us has within him a whole world of things, each man of us his own special world. And how can we ever come to an understanding if I put in the words, I utter the sense and value of things as I see them; while you who listen to me must inevitably translate them according to the conception of things each one of you has within himself. We think we understand each other, but we never really do.”

Luigi Pirandello, Six Characters in Search of an Author.

Poster Sessions

Tue, 10 June @ 21:30 Poster Session 1 (Da Vinci Conf Room, 1st floor of the Congress Centre, number 6 on the resort map).

Thu, 12 June @ 21:30 Poster Session 2 (Da Vinci Conf Room, 1st floor of the Congress Centre, number 6 on the resort map).

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More Lecturers TBA

Directors:

Giuseppe Nicosia, *University of Catania, Italy*

Panos Pardalos, *University of Florida, USA*

“Those who have an eye find what they are looking for even with their eyes closed”

Italo Calvino