

# 4th Advanced Course on Data Science & Machine Learning – ACDL 2021

*Certosa di Pontignano – Siena, Tuscany, Italy*

19 – 23 July 2021

<https://acdl2021.icas.cc/>

acdl@icas.cc

Schedule is subject to change – Last update 18 June (3 pages)

Time Zone: Central European Time (Italy Time)

	Mon, 19 July	Tue, 20 July	Wed, 21 July	Thu, 22 July	Fri, 23 July
07:30 – 09:00	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
09:00 – 09:50	<i>Chris Bishop</i>	<i>Jürgen Bajorath</i>	<i>Bettina Berendt</i>	<i>Marco Gori</i>	<i>Isabel Valera</i>
09:50 – 10:40	<i>Chris Bishop</i>	<i>Jürgen Bajorath</i>	<i>Bettina Berendt</i>	<i>Marco Gori</i>	<i>Isabel Valera</i>
10:40 – 11:20	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:20 – 12:10	<i>Roman Belavkin</i>	<i>Davide Bacciu</i>	<i>Ivan Martino</i>	<i>Joaquin Vanschoren</i>	<i>Panos Pardalos</i>
12:10 – 13:00	<i>Roman Belavkin</i>	<i>Davide Bacciu</i>	<i>Marta Kwiatkowska</i>	<i>Joaquin Vanschoren</i>	<i>Marta Kwiatkowska</i>
13:00 – 15:00	Lunch	Lunch	Lunch	Lunch	Lunch
15:00 – 15:50	<i>Michael I. Jordan</i>	<i>Georg Gottlob</i>	<i>Silvia Chiappa</i>	Social Tour Guided Visit of Siena	<i>Daniela Rus</i>
15:50 – 16:40	<i>Pierre Baldi</i>	<i>Georg Gottlob</i>	<i>Silvia Chiappa</i>		<i>Roman Belavkin</i>
16:40 – 17:20	Coffee break	Coffee break	Coffee break		Coffee break
17:20 – 18:10	<i>Pierre Baldi</i>	17:20 Guided Visit of the Certosa di Pontignano & 18:20 Wine Tasting	<i>Jacob D. Biamonte</i>		<i>Roman Belavkin</i>
18:10 – 19:00	<i>Oren Etzioni</i>		<i>Jacob D. Biamonte</i>		<i>Mihaela van der Schaar</i>
19:00 – 19:10	Break		Break	Break	
19:10 – 20:00	<i>Oren Etzioni</i>		<i>AI LSCI Presentation</i>		
20:00 – 22:00	Dinner	Dinner	Dinner	Dinner	Social Dinner
22:00 – 22:40			Oral Presentations	Oral Presentations	

Arrival: Sunday July 18 (Dinner at 20:30)

Departure: Saturday July 24 (Breakfast 07:30-09:00)

Registration: Sunday July 18 (19:30-20:30) and Monday July 19 (8:00-9:00). The registration desk will be located close to the Main Conference Room. Upon registration at the desk, you will receive your badge, and course materials. To facilitate the process please bring with you the *registration confirmation*. You are kindly requested to wear your name badge during all events of the course. **ZOOM: for ACDL 2021 participants using remote connection.** As you know, ACDL 2021 is a hybrid event: in person for those who can come to Tuscany, and online for those who want to attend virtually. ACDL 2021 (for participants using remote connection) will use Zoom (<https://zoom.us>). The online lectures and tutorials (e.g., live presentations or recorded ones) will be made possible. ACDL 2021 virtual participants will receive the link and the password. **WiFi Name:** Silver (it is an open Wi-Fi); if you have login and password, you can use Eduroam.

## Lecturers

*Davide Bacciu, University of Pisa, Italy*

*Jürgen Bajorath, University of Bonn, Germany*

*Pierre Baldi, University of California Irvine, USA (virtual)*

*Roman Belavkin, Middlesex University London, UK*

*Bettina Berendt, KU Leuven, Belgium*

*Jacob D. Biamonte, Skolkovo Institute of Science and Technology, Russian Federation (virtual)*

*Chris Bishop, Microsoft, Cambridge, UK Laboratory Director at Microsoft Research Cambridge, UK (virtual)*

*Silvia Chiappa, DeepMind, London, UK (virtual)*

*Oren Etzioni, Allen Institute for AI, USA CEO at Allen Institute for AI (virtual)*

*Marco Gori, University of Siena, Italy*

*Georg Gottlob, Computer Science Dept, University of Oxford, UK (virtual)*

*Michael I. Jordan, University of California, Berkeley, USA (virtual)*

*Marta Kwiatkowska, Computer Science Dept., University of Oxford, UK (virtual)*

*Panos Pardalos, University of Florida, USA (virtual)*

*Daniela Rus, MIT, USA – Director of CSAIL (virtual)*

*Isabel Valera, Saarland University, Germany Max Planck Institute for Intelligent Systems, Tübingen, Germany (virtual)*

*Mihaela van der Schaar, University of Cambridge, UK (virtual)*

*Joaquin Vanschoren, Eindhoven University of Technology, The Netherlands*

## Tutorial

*Ivan Martino, Royal Institute of Technology, Sweden*

## Lecturers

- **Davide Bacciu**, *University of Pisa, Italy*  
Topics: Deep Learning, Generative Models, Learning for Graphs.
  - Lecture 1: Deep Graph Networks: Fundamentals
  - Lecture 2: Deep Graph Networks: Generative approaches and research directions
- **Jürgen Bajorath**, *University of Bonn, Germany*  
Topics: Artificial Intelligence, Life Sciences, Chemoinformatics, Drug Discovery
  - Lecture 1: Data trends and artificial intelligence in medicinal chemistry and drug design
  - Lecture 2: Rationalizing molecular promiscuity through data analysis and machine learning
- **Pierre Baldi**, *University of California Irvine, USA*  
Topics: Artificial Intelligence, Deep Learning.
  - Lecture 1: Deep Learning in Science (1/2)
  - Lecture 2: Deep Learning in Science (2/2)
- **Roman Belavkin**, *Middlesex University London, UK*  
Topics: Information Theory, Mathematics for Machine Learning.
  - Lecture: Value of Information in Neural Networks
  - Tutorial 1: Probability and Information
  - Tutorial 2: Random Functions and Stochastic Processes
  - Tutorial 3: Game and Optimization Theories
- **Bettina Berendt**, *KU Leuven, Belgium*  
Topics: AI, Data Science, and Ethics
  - Lecture 1: Is hiding fair? (1/2)
  - Lecture 2: Is hiding fair? (2/2)
- **Jacob D. Biamonte**, *Skolkovo Institute of Science and Technology, Russian Federation*  
Topics: Quantum Machine Learning.
  - Lecture 1: Introduction to variational quantum algorithms: optimisation, machine learning and universality of the variational model (1/2)
  - Lecture 2: Introduction to variational quantum algorithms: optimisation, machine learning and universality of the variational model (2/2)
- **Chris Bishop**, *Microsoft, Cambridge, UK Laboratory Director at Microsoft Research Cambridge & University of Edinburgh*  
Topic: Machine Learning.
  - Lecture 1: Introduction to Machine Learning: Part 1
  - Lecture 2: Introduction to Machine Learning: Part 2
- **Silvia Chiappa**, *DeepMind, London, UK*  
Topics: Bayesian & causal reasoning, graphical models and variational inference.
  - Lecture 1: Causal Inference (1/2)
  - Lecture 2: Causal Inference (2/2)
- **Oren Etzioni**, *Allen Institute for AI, USA CEO at Allen Institute for AI*  
Topics: AI, Meta-Search, Machine Reading, Open Information Extraction.
  - Lecture 1: Is AI Good or Evil?
  - Lecture 2: Semantic Scholar, NLP, and the Fight against COVID-19
- **Marco Gori**, *University of Siena, Italy*  
Topics: Machine Learning, Vision.
  - Lecture 1: Deep Learning To See Towards New Foundations of Computer Vision (1/2)
  - Lecture 2: Deep Learning To See Towards New Foundations of Computer Vision (2/2)
- **Georg Gottlob**, *Computer Science Dept, University of Oxford, UK*  
Topics: Knowledge Processing, Logic, AI.
  - Lecture 1: Knowledge Processing, Logic, and the Future of AI (1/2)
  - Lecture 2: Knowledge Processing, Logic, and the Future of AI (2/2)

- **Michael I. Jordan**, *University of California, Berkeley, USA*  
Topics: Machine Learning, Computer Science, Statistics, AI, Optimization.
  - Lecture 1: TBA
- **Marta Kwiatkowska**, *Computer Science Dept., University of Oxford, UK*  
Topics: Probabilistic reasoning, Deep Learning, Safety and Trust for Mobile Autonomous Robots.
  - Lecture 1: Safety and Robustness for Deep Learning Part 1
  - Lecture 2: Safety and Robustness for Deep Learning Part 2
- **Panos Pardalos**, *University of Florida, USA*  
Topics: Data Science, Optimization, Networks.
  - Lecture 1: Networks of Networks
- **Daniela Rus**, *CSAIL, MIT, USA Director of CSAIL*  
Topics: Science of Autonomy, AI & ML, Robotics, Systems & Networking.
  - Lecture 1: Understanding Risk and Social Behavior Improves Decision Making for Autonomous Vehicles
- **Isabel Valera**, *Saarland University, Germany Max Planck Institute for Intelligent Systems, Tübingen, Germany*  
Topics: Machine Learning, Probabilistic Methods, Ethical Machine Learning.
  - Lecture 1: Interpretable and Fair ML (1/2)
  - Lecture 2: Interpretable and Fair ML (2/2)
- **Mihaela van der Schaar**, *University of Cambridge, UK*  
Topics: Machine Learning for Medicine, Data Science and decisions, Artificial Intelligence.
  - Lecture 1: Why Medicine is Creating Exciting New Frontiers for Machine Learning
  - Lecture 2: Quantitative epistemology: conceiving a new human-machine partnership
- **Joaquin Vanschoren**, *Eindhoven University of Technology, The Netherlands*  
Topics: Artificial Intelligence, Machine Learning, AutoML, meta-learning
  - Lecture 1: Meta-learning for Deep Learning
  - Lecture 2: Meta-learning for Automated Machine Learning

## Tutorial

- **Ivan Martino**, *Royal Institute of Technology (KTH), Sweden*  
Topics: Mathematics of Deep Learning, Unsupervised Learning, Sentiment Analysis, Machine Learning
  - Tutorial: Political Coalitions by Unsupervised Learning

## ORAL PRESENTATIONS

### PRESENTATION GUIDE

Oral Presentations and Poster Presentations are **8 mins long**. We will share an allocation schedule asap.

Please read the following document:

<https://www.nature.com/scitable/topicpage/oral-presentation-structure-13900387/>

## SOCIAL ACTIVITIES

### Visit of the Certosa di Pontignano, Wine Tasting and Guided Tour of Siena

- Guided tour of the Certosa di Pontignano, guided visit to the famous Certosa Chapel (called the Sistine Chapel of Siena).
- Social Tour: Guided tour of Siena.
- Wine Tasting of Tuscan Wines (e.g., Chianti Classico, Chianti Classico Riserva, Chianti Classico Gran Selezione) produced in Siena, in general, and in the surroundings of the Certosa di Pontignano, in particular.