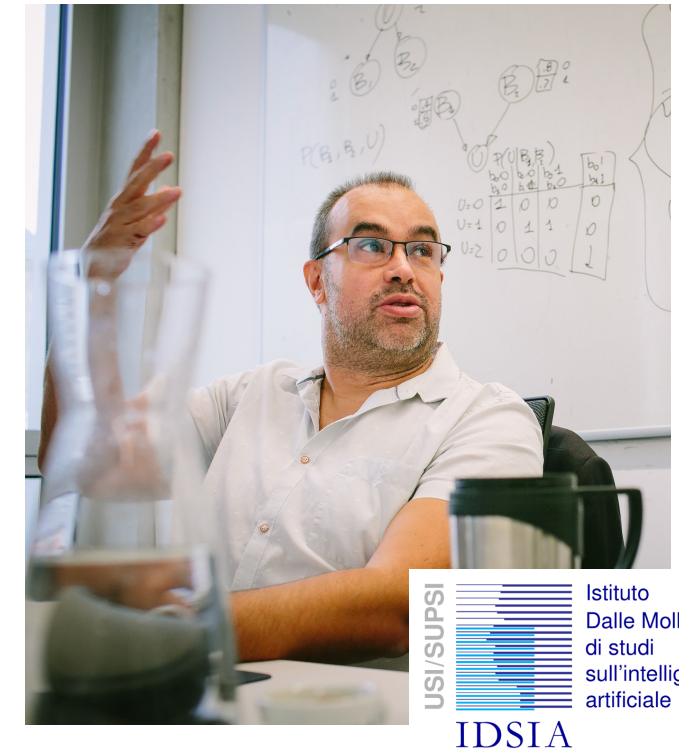


SIPTA Summer School (Day 4) Four Lectures on Imprecise Probabilities in AI

Fabio Gagliardi Cozman

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Alessandro Antonucci



Schedule & Topics

[9.00 – 10.45]	Lecture 1	<ul style="list-style-type: none">• AI: Definition, Scope, Benefits and Risks• Probabilistic (Graphical) models• Light & Shadows of Deep Learning, Reinforcement Learning, XAI, the need of causal approaches	All
[11.15 – 12.45]	Lecture 2	<ul style="list-style-type: none">• Probabilistic Logic• Argumentation• Decision Processes	Fabio
[14 - 15.30]	Lecture 3	<ul style="list-style-type: none">• Credal networks• Probabilistic Circuits	Cassio
[16 - 17.30]	Lecture 4	<ul style="list-style-type: none">• Background on causality• Structural causal models as credal networks	Alessandro

Goals

- Lecture 1 To give a **broad overview of AI** and the various topics where probabilistic indeterminacy and imprecision appear.
- Lecture 2 To review three topics where **probabilistic imprecision** has been adopted by many artificial intelligence researchers: **probabilistic logic, argumentation, and sequential decision making**.
- Lecture 3 To present some **probabilistic graphical models** and their **imprecise probability counterpart**, and to discuss on **how they can be used in machine learning**: reliable classification, multi-label classification, active learning, outlier detection, adversarial approaches.
- Lecture 4 To describe the **deep connection between (some) causality theories and imprecise probabilities**, showing how this might boost the current research in the causality field (and vice versa).