Logical Foundations for Probabilistic Methods

Workshop Programme

13 October 2026

Mathematical Institute of the Serbian Academy of Sciences and Arts

Room 301f, 3rd floor · Kneza Mihaila 36, Belgrade

Programme

Time	Talk
10:00–10:10	Opening
10:10–11:10	**Natasha Alechina — Probabilistic Temporal and Strategic Logics (Invited Talk)**
11:10–11:30	Coffee break
11:30–12:00	Dragan Doder — Quantitative Approaches to Formal Argumentation
12:00–12:30	Aleksandar Perović — Sources of Non-Compactness
12:30–13:00	Šejla Dautović — First-Order Branching Time Logic with Probability Operators

Detailed Programme

10:00–10:10 Opening

10:10–11:10 • INVITED TALK

Natasha Alechina *(Open University of the Netherlands and Flanders)*

Probabilistic Temporal and Strategic Logics

Abstract. I will briefly survey temporal logics and logics of strategic ability, where different future courses of events have different probabilities, and mention some of their applications in computer science. I will then talk in more depth about a probabilistic temporal logic for reasoning about bounded policies.

Short bio. Natasha Alechina is Professor at the Open University of the Netherlands and Flanders. She received her PhD in logic from the University of Amsterdam in 1995 and previously held positions at the University of Birmingham and the University of Nottingham. Her research focuses on logic and its applications in artificial intelligence and multi-agent systems, including strategic reasoning, verification and synthesis, norms, responsibility, and safe AI. She has published over 150 papers at international conferences and in journals. She is Editor-in-Chief of the Journal of Logic, Language and Information (JoLLI) and an editor of Artificial Intelligence (AIJ).

11:10–11:30 Coffee break

11:30–12:00

Dragan Doder *(Utrecht University)*

Quantitative Approaches to Formal Argumentation

Abstract. Argumentation is a reasoning approach based on graphs and logic that has been used for solving numerous and varied Artificial Intelligence problems. In this talk, I will present several quantitative approaches to reasoning in argumentation, including probabilistic and gradual argumentation.

12:00–12:30

Aleksandar Perović *(University of Belgrade)*

Sources of Non-Compactness

Abstract. Through two examples (Discrete Linear Temporal Logic LTL and Probabilistic Logic without iteration of probability operators LPP_2), we shall discuss sources of non-compactness in various logics involving Kripke semantics. The emphasis is on the construction of suitable infinitary inference rules that allow strong completeness.

12:30–13:00

Šejla Dautović *(Mathematical Institute of the Serbian Academy of Sciences and Arts)*

First-Order Branching Time Logic with Probability Operators

Abstract. We present a first-order probabilistic temporal logic that combines the temporal operators of CTL* and probability operators with first-order quantification. Our main result is a strong completeness theorem for the corresponding axiomatic system.