A.D. 1308
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DIPARTIMENTO
DI MATEMATICA E INFORMATICA

Logical properties of spatial structures and their patterns

Michela Quadrini

Computer Science Division, School of Science and Technology,
University of Camerino

Mercoledì 4 giugno 2025 – ore 15:00

Aula Gialla

Dipartimento di Matematica e Informatica

Abstract

Spatial configurations of interacting entities, often dynamic and high-dimensional, are central to understanding and predicting the behavior of complex systems in areas such as robotics and molecular biology. Moreover, analyzing spatial configurations or patterns in domains like medical imaging is essential for diagnosis, segmentation, and anomaly detection tasks. To formally analyze such configurations, relying on methods capable of specifying and verifying spatial properties is crucial. This talk will present some of the proposals recently developed to support the specification and verification of spatial properties, their temporal evolution, and the application of these techniques across different domains. By using simple application scenarios, we will discuss how spatial structures can be modeled and the modal operators used to specify the properties of these structures. Finally, we will show how these properties can be verified thanks to model-checking algorithms.