

INFORMATICA, SISTEMISTICA E Viale Sarca, 336



SEMINAR ANNOUNCEMENT

The second meeting of the Neuro-Symbolic Seminar (NeSS) will be held on Wednesday July 10th at 3.30 pm

Registration is mandatory at the following link: https://unimib.webex.com/weblink/register/re107b1623bd117f88b684f95f1cc3aca

Capturing Knowledge Graphs and Rules with **Region Based** Embeddings

Speaker Prof. Steven Schockaert Cardiff University

Abstract: Most approaches to neurosymbolic AI rely on a relatively loose coupling between learning and reasoning. To enable a tighter integration between these components, we need some kind of alignment between vector space representations and symbolic knowledge. In this talk, I will outline a strategy for achieving this, which builds on the idea that predicates can be represented as convex regions in some vector space. Symbolic knowledge, e.g. in the form of existential rules, can then be encoded in terms of constraints on the spatial arrangement of these regions. To enable such representations to be learned effectively, in practice we can only consider regions which are sufficiently simple. At the same time, however, the choice of which regions are considered can dramatically impact the expressivity of the framework. Among others, I will argue that using representations based on axis-aligned octagons have particular advantages. Such regions are closed under intersection and compositions while still being expressive enough to capture a large class of rules.

Bio: Steven Schockaert is a professor at Cardiff University, working at the intersection of Natural Language Understanding and Knowledge Representation and Reasoning. He was the recipient of the ECCAI Doctoral Dissertation Award, the IBM Belgium Prize for Computer Science, and an ACL 2023 outstanding paper award, among others. He is co-editor-in-chief of AI Communications, Program co-chair of COLING 2025, and a fellow of the Alan Turing Institute. He also serves on the editorial board of "Machine Learning" and of "Neurosymbolic Artificial Intelligence".

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