Invited Talk
KEMAI Research Training Group GRK 3012/1

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Trung-Kien Tran,
Bosch Center for Artificial Intelligence
Neuro-Symbolic AI: A Case Study in Combining Inductive and Deductive Reasoning over Knowledge Graphs

Abstract. Knowledge Graphs have become a common method for storing large-scale structured knowledge that is both accessible and reusable for various applications. In such applications, a crucial task is the inference of new knowledge from existing information, which can be achieved through two primary mechanisms: inductive reasoning and deductive reasoning. Inductive reasoning, such as via knowledge graph embeddings, leverages machine learning techniques to learn the representation of data and perform inference in a low-dimensional vector space. On the other hand, deductive, ontological reasoning captures abstract knowledge and performs inference at the symbolic level. In this talk, we will present the basics of both methods, discuss their pros and cons, and demonstrate how they can be combined in our recent research work. Additionally, we will explore applications of knowledge graphs and their role in the era of Large Language Models.

Speaker Bio. Trung-Kien Tran is a lead research scientist and project manager at Bosch Center for Artificial Intelligence, Corporate Research in Germany. He obtained his Master degree from TU Vienna and TU Dresden. Before joining Bosch, he was a PhD candidate at the University of Ulm, working under the supervision of Prof. Birte Glimm and Dr. Yevgeny Kazakov. His research interests include knowledge representation and reasoning, large language models, and applications of these technologies. He has published at top-tier conferences such as AAAI, IJCAI, WWW, ISWC, EMNLP, and CVPR. Some of his collaborative works have received Best Student Paper Awards (Reasoning Web 2016, ISWC 2022) and have been nominated for Best Paper Awards (ISWC 2022, ESWC 2024).

Time & Place.

Thursday, February 5, 2026
5.15 pm at
Uni West, Room 47.0.501

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