

First International Workshop on Generative Neuro-Symbolic AI (GeNeSy 2024)

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Abstract

The fields of generative and neuro-symbolic AI have recently gained significant traction in both academia and industry, owing to their profound impact on real-world applications and their potential to achieve human-level intelligence. While generative AI excels in producing human-like outputs across various tasks, neuro-symbolic AI aims to integrate cognitive and perceptive intelligence. Despite their apparent relevance to human-level AI, the relationship between these two paradigms remains largely unexplored. The GeNeSy 2024 workshop was conceived to address this gap, providing a platform for researchers to present and discuss novel ideas and approaches in the emerging field of generative neuro-symbolic AI.

Keywords

Generative Model, Neuro-symbolic AI, Neuro-symbolic Representations, Large Language Models

1. Introduction

The GeNeSy 2024 workshop¹ sought to initiate a comprehensive discourse on the nature and definition of generative neuro-symbolic AI, encompassing its methodologies, architectures, and approaches. While Large Language Models (LLMs) undoubtedly play a central role in this domain, current research suggests that the integration of well-structured symbolic approaches—such as ontologies, knowledge graphs, and probabilistic logic programming—is crucial for developing generative models capable of human-level intelligence.

Held in conjunction with the 21st Extended Semantic Web Conference (ESWC 2024) in Hersonissos, Greece, on May 26, 2024, the workshop benefited from the diverse expertise of attendees from both academia and industry, spanning fields such as knowledge graphs, semantic web technologies, and AI/ML. The workshop received 7 submissions, of which 6 were accepted for publication in the proceedings. These comprised 4 regular papers and 2 dissemination papers.

2. Keynotes

The GeNeSy workshop featured two distinguished keynote speakers, both renowned for their significant contributions to generative neuro-symbolic AI. Sungjin Ahn² (Professor of KAIST University) presented recent work in cognitive-grounded machine learning, opening up new opportunities to bridge both fields around common challenges. He elucidated an abstract architecture for integrating generative and inductive neural models while incorporating symbolic reasoning capabilities. Frank van Harmelen³

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(Professor of Vrije University (VU) Amsterdam) delineated the crucial distinctions between neuro-symbolic and neuro-semantic AI, emphasizing the pivotal role of semantic representations in endowing neural models with comprehensive symbolic reasoning abilities. These insightful presentations have been made available on the GeNeSy website for broader dissemination and continued discussion within the research community.

3. Program Committee

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