

Preface for the 1st Workshop on Semantic Generative Agents on the Web at ESWC 2025 (SemGenAge2025)

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Abstract

This preface summarises the 1st Workshop on Semantic Generative Agents on the Web (SemGenAge2025), a co-event with the Extended Semantic Web Conference (ESWC 2025), held on May 2nd, 2025, in Portorož, Slovenia.

1. Introduction

A quarter of a century ago Berners-Lee originally expressed his vision of the Semantic Web as follows:

“I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web – the content, links, and transactions between people and computers. A “Semantic Web”, which makes this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The “intelligent agents” people have touted for ages will finally materialize.”

Nowadays, Large Language Models (LLMs) have materialized and are seemingly providing such “intelligent agents” capabilities: They are software systems that can perceive their environment through language and act by generating language with some level of autonomy. With respect to the internet they are able to analyze data on the web, including communication between people and computers and they are able to talk to both, other machines and humans.

Technologically the original vision of agents was based on symbolic knowledge representations (like RDF, OWL), agents with planning and deductive reasoning capabilities and symbolic agent communication languages (like FIPA-ACL) for multi-agent interactions and web service calls (like WSDL and WSCL). This is in stark contrast to how LLMs achieve those capabilities: They are based on machine-learned knowledge representation from textual web data. LLM-agents exhibit statistical and inductive inference capabilities and facilitate natural language for receiving instructions, for communication with humans and between machines.

While LLM development has attracted huge business interest they also have fundamental limitations that the original semantic web technologies did not have: Their behavior is not guaranteed to be correct, controllable and comprehensible. Furthermore, they are computationally inefficient and without performance guarantees with regard to many tasks. When these characteristics are important, traditional semantic web technologies could be a better choice.

This workshop concentrates on technologies and applications that unite the advantages of both worlds. We particularly invited submission with one of the following characteristics:

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- Agent knowledge representation: Representations of agents' states or memories learned from web data that are interpretable and analyzable.
- Agent reasoning capabilities: Flexible and human-like agent behavior which still is controllable and interpretable.
- Agent communication: The flexibility and expressiveness of natural language, but also comprehensible interactions in a formal and interpretable language.

We are particularly interested in, but not limited to, research on social interactions of any combination of agent(s) and/or human(s) on the web, including the architectures and platforms enabling and influencing such interactions:

- Interpretable agents for simulating (nonrational) human behavior
- Agents on the (social) web for analyzing communicative behavior
- Platforms for simulating and researching agent communication and platform mechanics
- Recursive AI agents for higher levels of task complexity, adaptivity, and autonomy

The target audience of this workshops are researchers from various disciplines:

- Semantic technologies and artificial intelligence, proposing and discussing novel technological advancements in the area of Neurosymbolic AI, Generative Agents, Web Science and Multiagent Systems.
- Computational Social Sciences, Computational Communication Science, Digital Media Studies, and related fields, using such technologies for research human communicative behavior on social networks and the influence of platform mechanics and bots on online discourse, opinion formation, and (online) behaviour.
- Marketing, customer service and related fields that study (influences on) consumer behaviour by automating customer relationship management.

2. Organization

2.1. Organizing Committee

- Achim Rettinger, Trier University
- Damian Trilling, VU Amsterdam & University of Amsterdam
- Marko Grobelnik, Jozef Stefan Institute

2.2. Program Committee

- John Shawe Taylor, UCL
- Estevam Hruschka, MegaGon Labs
- Phoebe Sengers, Cornell University
- Natasa Milic-Frayling, Qatar Computing Research Institute / Nottingham University
- Jan Rupnik, Jozef Stefan Institute / Extrakt.ai
- Matthias Nickles, University of Galway
- Anke Stoll, TU Ilmenau
- Rupert Kiddle, VU Amsterdam
- Felicia Loecherbach, University of Amsterdam
- Paul Lukowicz, DFKI Kaiserlautern
- Raphael Troncy, EURECOM
- Marko Tadic, University Zagreb
- Konstantin Todorov, University of Montpellier

- Michael Mäs, Karlsruhe Institute of Technology
- Jonas Fegert, FZI Forschungszentrum Informatik
- Steffen Thoma, FZI Forschungszentrum Informatik
- Simon Munker, Trier University
- Kai Kugler, Trier University

2.3. Keynote speakers

- Denisa Reshef Kera, Senior Lecturer, Bar-Ilan University – Interdisciplinary Studies Unit, Science Technology and Society Program
- Dr. Matthias Nickles, School of Computer Science at National University of Ireland, Galway

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