# Symbolic and Neuro-symbolic AI

##### Session 3.1 (SEMANTiCS)

#### Time: Thursday, September 19, 2024 - 10:30 to 12:00

#### Chair:

## **Talks**

### The Dimensions Knowledge Graph - Leveraging neuro-symbolic AI to accelerate business decisions [SP]

The data needed to create new opportunities and drive decisions is abundant, but it is distributed across heterogeneous sources and lacks the context needed to deliver insights. The Dimensions Knowledge Graph powered by metaphactory combines the power of symbolic and subsymbolic AI to transform data into knowledge, connect internal data with global research knowledge, and augment and scale business decisions. It is the world’s largest and most comprehensive scientific knowledge graph covering the entire R&D landscape and is designed for seamless integration with other datasets from the public domain, as well as private enterprise data sources.

| Peter Haasemetaphacts |
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### Online Retail: Making Complex Product Recommendations Simple with Semantic Reasoning

Recommending the right products at the right time can be complex, when large numbers of product attributes and concepts need to be considered. Companies that have traditionally relied upon human-to-human expert advice are looking at how to offer the same expert knowledge when buying online. Providing such AI expert assistance accurately requires more than a knowledge graph alone – semantic reasoning can be used to model the “rules” that determine “what goes with what”, transforming the way many recommendation engines work today. The outcome helps retailers offer complex product configurations online by scaling scarce expert knowledge.

| Peter Crocker | Thomas Vout | Philip Foster |
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### How Semantic Technology Brings Clinical Knowledge to Decision Support in an Instant

Semantic technology use cases for medical and pharma applications involve some of the largest and most complex ontologies and knowledge graphs. In this presentation we will hear about the first intelligent assistant of its kind that relies on a hybrid AI (logical semantic reasoning and ML image recognition), fully integrated on-device in ultrasound platforms—showcasing the SUOG (Smart Ultrasound in Obstetrics and Gynecology) project1. The use of semantic technology in this project will be explored along with how performance and scalability was achieved on-device by using an in-memory knowledge graph and reasoning engine. Examples and parallels will be highlighted showing this technology’s relevance with other medical applications and the pharma industry.

| Peter Crocker | Thomas Vout | Philip Foster |
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### Next-Generation Cybersecurity: Integrating Knowledge Graphs and Neuro-symbolic AI with STIX and TAXII

This presentation will delve into the practical applications of Knowledge Graphs and Neuro-symbolic AI in cybersecurity, highlighting their potential to transform threat detection and response. In particular we will be focusing on how to automatically extract structured STIX objects from unstructured incident reports. By incorporating the principles of STIX and TAXII, we demonstrate how these technologies can enhance collaborative threat analysis, automated threat exchange, and ultimately, the overall security posture of organizations.

| Jans Aasman |
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