

INVITED SESSION SUMMARY**Title of Session:**

RAG – Robust, Adaptive and Generative AI

Name, Title and Affiliation of Chair:

Aya Saad, Research Scientist,
SINTEF Ocean AS
aya.saad@sintef.no

Anne Håkansson, Professor
UiT Norges arktiske universitet
Postboks 6050 Langnes
9037 Tromsø
anne.hakansson@uit.no

Details of Session (including aim and scope):

Methods in AI for robotic control, mobile platforms, and cognitive cyber-physical systems are developing rapidly. They tackle the challenging task of modeling real-world systems and environments through data, using machine vision, reinforcement learning for control, probabilistic machine learning, among many others. Such data-driven approaches have led to many concerns regarding the robustness, stability, and overall safety of these systems.

While data-driven approaches based on learning algorithms have seen huge success in the last decade, when applied to cyber-physical systems such as manufacturing applications and healthcare robotics, the lack of safety guarantees causes trust issues. A central challenge is defining and implementing robustness for different applications and providing methods for analyzing and verifying models. In this context, the session emphasizes the critical necessity for robust decision-making processes to ensure the reliability and safety of AI applications. The focus of this session is to investigate the diverse meaning of robust AI and gather a wide array of approaches to the problem.

The proposed invited session provides a forum for bringing together researchers from academia and industry to explore and present their findings in Robust Artificial Intelligence with theories, systems, technologies, and approaches for testing and validating them on challenging real-world, safety-critical applications.

Topics

Research papers on all aspects of Robust AI. Topics include, but are not limited to:

- Knowledge-driven models
- Reasoning-based methods
- Robustness analysis
- Adaptive AI
- Generative AI
- Trustworthiness
- Machine learning biases
- Adversarial attacks and security
- Cognitive models and bio-inspired AI
- Hybrid-models
- Explainable AI

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

- Prof Anne Håkansson

- Dr. Aya Saad
- Assoc. Prof. Annette Stahl
- Dr. Christian Schellewald
- Prof. Rudolf Mester

Research Centers Invited to Contribute and currently involved in this research area:

- The Autonomous and Robotic Aquaculture systems Lab in SINTEF Ocean
<https://www.sintef.no/en/expertise/ocean/sintef-ace-roboticlab/>
- The Center for Artificial Intelligence, CAI
https://en.uit.no/forskning/forskningsgrupper/gruppe?p_document_id=504980
- The Norwegian OpenAILab <https://www.ntnu.edu/ailab>
- The Robotic Vision Group <https://www.ntnu.edu/roboticvision>

Website URL of Call for Papers (if any):

<https://sites.google.com/view/robustai/home>

Email & Contact Details:

Aya Saad, Research Scientist, aya.saad@sintef.no, NTNU, Trondheim, Norway
Professor Anne Håkansson, anne.hakansson@uit.no, IFI, UIT, Tromsø, Norway