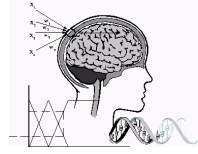




International

*Innovation in Knowledge Based and Intelligent
Engineering Systems*



INVITED SESSION SUMMARY

Title of Session: Artificial Intelligence in Cybersecurity: Emerging Trends in Defensive and Offensive Operations

Name, Title and Affiliation of Chair:

Dr. Kashif Naseer Qureshi, University of Limerick, Ireland
Miss Aarka Christal Sujaa Ganesan, Co-Chair, University of Limerick, Ireland

Details of Session (including aim and scope):

Artificial Intelligence is reshaping the cybersecurity landscape and transforming both defensive resilience and offensive capabilities. This session introduces a forward-looking dual-framework that explores how AI can intelligently secure, adapt, and autonomously respond within complex cyber ecosystems.

The aim of this session is to examine emerging AI paradigms that enhance cybersecurity reasoning, automation, and strategic decision-making across modern infrastructures. It will highlight neuro-symbolic AI for advanced cybersecurity reasoning, AI-driven cyber deception and cognitive security, and the design of autonomous cybersecurity agents with AI orchestration for real-time adaptive defense. The scope further extends to federated and privacy-preserving AI models, Zero Trust architectures with AI-enabled access control, and AI applications in supply chain and IoT cybersecurity resilience. In anticipation of next-generation threats, the session will also address quantum-resilient AI approaches for secure and sustainable cyber operations.

By bridging theoretical innovation with operational implementation, this session provides researchers, practitioners, and policymakers with strategic insights into building intelligent, autonomous, and future-ready cybersecurity ecosystems.

We invite original research on:

- Neuro-symbolic AI for explainable and context-aware cybersecurity reasoning
- AI-driven cyber deception, cognitive security, and adversarial intelligence
- Federated, distributed, and privacy-preserving AI for secure collaboration
- Zero Trust models enhanced by AI-driven identity, behavior, and access control
- AI solutions for supply chain security and IoT/OT threat resilience
- Quantum-resilient AI models and post-quantum secure architectures
- Autonomous cybersecurity agents, AI orchestration, and self-healing systems
- Ethical, trustworthy, and responsible AI in cyber operations

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

1. Department of Electronics & Computer Engineering
(<https://pure.ul.ie/en/organisations/departement-of-electronics-computer-engineering/>)
2. Centre for Robotics and Intelligent Systems (<https://pure.ul.ie/en/organisations/centre-for-robotics-and-intelligent-systems/>)
3. Lero – the Research Ireland Centre for Software,

- (<https://pure.ul.ie/en/organisations/lero-the-research-ireland-centre-for-software/>)
4. School of Computing, University of Fraser Valley, Abbotsford, Canada

Website URL of Call for Papers (if any):

<https://pure.ul.ie/en/persons/kashif-naseer-qureshi/>

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