

RITICS Newsletter



RITICS Annual Showcase Highlights

On Tuesday 28th January 2025, the Research Institute for Trustworthy Inter-connected Cyber-physical Systems (RITICS) hosted its annual showcase at Scale Space, Imperial College London's White City campus. The showcase concentrates on RITICS sponsored projects and projects that are aligned with it. The full-day event featured nine presentations which included projects funded by EPSRC and concluded with a panel discussion, which brought together experts to explore pressing cyber security challenges and research advancements.

Key Presentations

Professor Awais Rashid (University of Bristol) introduced the SCULI programme, a five-year initiative addressing cyber security in large-scale infrastructures. The project aims to develop quantitative security metrics, manage systems with trusted and untrusted

components, and enhance incident response strategies.

Dr Sridhar Adepu (RITICS Fellow 2023, University of Bristol) highlighted the role of Digital Twins (DTs) in cyber security. DTs, which replicate physical systems for real-time analysis, are valuable for simulating attacks and testing resilience strategies but also pose unique security risks. His research investigated DT fidelity, human-machine interactions, and resilience improvements.

Sridhar's findings:

1. Limited focus on cyber security in digital twin research
2. Interconnected CNIs need secure communications
3. Security & resilience challenges – address new threats and technology advancement needed
4. Future research should focus on resilience, human factors and technology advancement

5. Collaboration is essential for digital twin security policies

Professor Siraj Shaikh (RITICS Fellow 2023, University of Swansea) examined the economic challenges of securing Critical National Infrastructure (CNI). He argued that cyber security must be economically viable and sustainable, requiring industry-government collaboration to bridge gaps between commercial and security priorities.

Siraj's findings: 

1.  Secondary analysis is needed -
 - Technical studies on OT/ICS/SCADA systems, sensors and actuators
 - Systems design and engineering principles to incorporate social technical and economic factors
 - Risk quantification models, with a focus on correlational and systemic risks on infrastructures planning and urban designs
2. Future research calls for broader, interdisciplinary approaches beyond cyber security, economics or international relations
3. Safety considerations – while outside the study's scope, safety-critical systems, occupational safety, and regulatory aspects hold valuable insights

Dr Ric Derbyshire (RITICS Fellow 2024, Orange Cyberdefense) focused on Operational Technology (OT) penetration testing, identifying gaps in methodology and industry collaboration. His research aims to standardise testing approaches for OT and

improve cooperation between cyber security professionals and systems engineers.

Dr Ashraf Tantavy (RITICS Fellow 2024, Cranfield University) explored security assurance for cyber-physical systems, emphasising the need for secure-by-design principles and model-based engineering to counter evolving threats.

Dr Neetesh Saxena (RITICS Fellow 2024, Cardiff University) investigated threats to cyber-physical assets, emphasising the need to map cyber risks and improve incident response strategies.

Panel Discussion Insights

The event concluded with a panel chaired by Prof. Chris Hankin, alongside Rob (NCSC), Taimoor Muhammad Khan (University of Greenwich), Josie Houghton (Rolls-Royce), and Victor Lough (Schneider Electric).

The panelists discussed the need for sustainable security solutions, industry incentives to promote and invest in cyber security, regulatory frameworks, and strategies to address legacy systems.

Participants agreed that mandatory regulations and collaborative investment could drive cybersecurity advancements across sectors.

RITICS continues to serve as a vital hub for cyber security research, fostering collaboration to strengthen national infrastructure resilience. If you're interested in any of these topics and would like to connect with any of the speakers, please contact ritics@imperial.ac.uk.



OPPORTUNITIES

RITICS will be hosting an event on Wednesday 4th June in Manchester, and we invite researchers and practitioners from the security and safety communities to present their work to the RITICS community.

If you're interested in presenting, please contact us at ritics@imperial.ac.uk by 24th March 2025.

UPCOMING EVENTS

Register and save the dates for the following events:

<u>Title</u>	<u>Location</u>	<u>Date</u>	<u>Registration</u>
Securing Critical Infrastructure in the Quantum Era	Watershed, Bristol	17 th March 2025	Register here
SPRITE+ Academic-Industry Meeting Day 2025	PLEXAL, Queen Elizabeth Olympic Park, Here East, 14 East Bay Lane, The Press Centre, London E20 3BS	25 th April 2025	Register here
CyberUK: Transforming resilience countering threats	Manchester	6 th to 8 th May 2025	Register here
RITICS - Security of Safety Critical Cyber-Physical Systems	Manchester Venue: TBC	4 th July 2025	Register here
RITICS Fest	London Venue: TBC	2 nd to 3 rd September 2025	Details to follow in the coming weeks
International Cyber Expo	Olympia Kensington	30 th September – 1 st October 2025	Register here

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