



## ICTS Seminar

**Title** : Building AI-Driven Self and Collective Awareness in Collaborative IoT Networks

**Speaker** : Divya Thekke Kanapram (Intangible Limited, United Kingdom)

**Date** : Tuesday, 22 October 2024

**Time** : 11:30 AM (IST)

**Abstract** : As the fields of machine learning and robotics advance, there is a growing need to enhance the self-awareness and collective intelligence of artificial agents. This talk explores cutting-edge approaches to developing multi-modal self-awareness in intelligent systems, with a particular emphasis on anomaly detection and state estimation in collaborative networks. The presentation will first introduce a novel framework that equips dynamic agents with self-awareness through multi-sensory data integration and advanced feature selection techniques. This framework enables agents to predict future states and identify anomalies with high accuracy. Moving beyond individual agents, the discussion will then focus on fostering collective awareness in interconnected networks, where machine learning-driven Internet of Things (IoT) nodes collaborate to detect anomalies and estimate states during joint tasks. A key highlight will be the role of networking protocols and communication efficiency in improving state estimation and anomaly detection in agent networks. The importance of model interpretability will also be addressed, showcasing how advanced graph-matching techniques enhance the clarity of predictions and support reliable inference from anomaly data. The talk will also outline future research directions, including the exploration of decentralized learning models for large-scale IoT networks, adaptive anomaly detection in dynamic environments, and real-time state estimation in edge-computing architectures. Potential applications of these advancements span various domains, including smart cities, autonomous systems, healthcare, and physics, where enhanced awareness and decision-making capabilities can drive innovation and ensure robust system performance.

**Venue** : Online

Zoom Link: <https://icts-res-in.zoom.us/j/93331724382?pwd=hM0bsYckI8iq2YKCr6EpqwFtuDbf0o.1>

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