Platform and Device Innovations

for Energy-Efficient, Resilient, and Secure 6G-IoT Systems

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CONSORTIUM

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Coordinator Karlstad University (KAU)

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PROJECT VISION

Design, Implement, and Validate **Omni-IoT**, a 6G-compliant, IoT-first platform, for globally scalable, energy-efficient, resilient, and secure IoT applications and services

Targeted solutions in the Omni-IoT platform

USER EQUIPMENT (UE)



- AI/ML-native UE operation modes
- On-UE efficient AI/ML execution
- On-UE security mechanisms

RADIO ACCESS NETWORK (RAN)



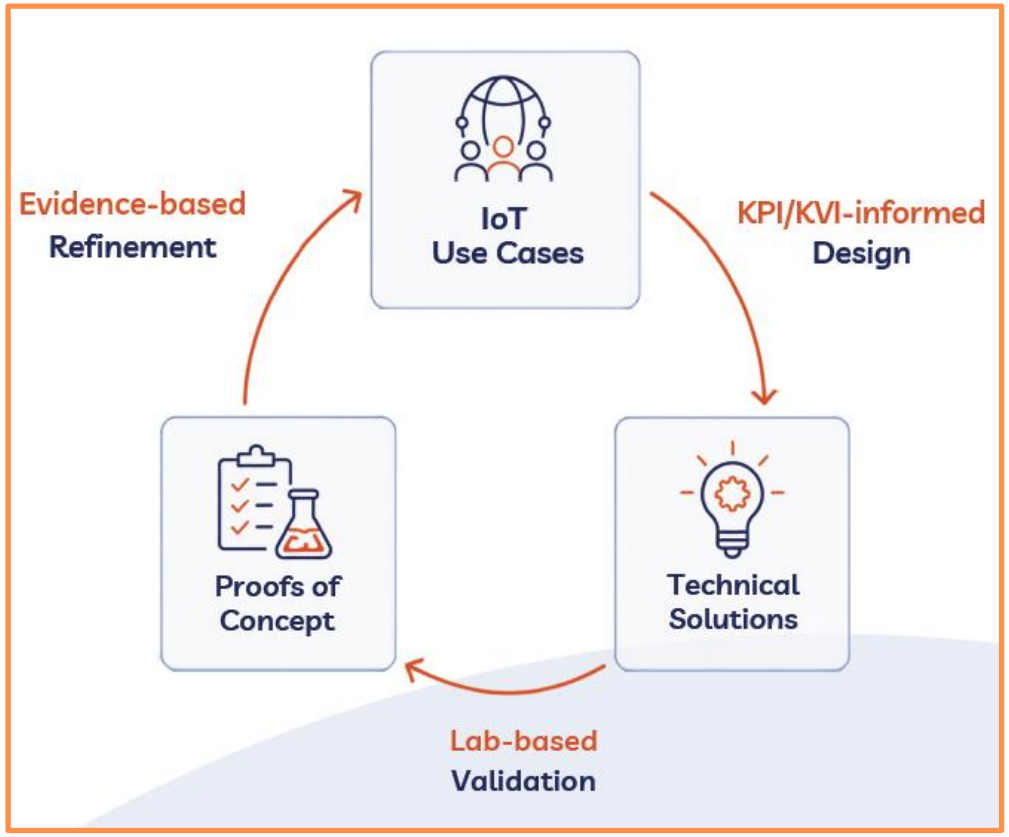
- AI/ML-driven multi-connectivity between Terrestrial and Non-Terrestrial Networks
- AI/ML-based multi-technology Integrated Sensing and Communication (ISAC) and Positioning

CORE NETWORK (CN)



- AI/ML-driven, multi-domain CN and service orchestration
- Novel CN functions for globally secure interoperability

METHODOLOGICAL APPROACH



Use Cases

INDUSTRIAL IoT



Optimisation of industrial processes in indoor or outdoor factories where mobile IoT devices communicate while sensing.

UNDERGROUND IoT



Enhancement of workers' safety in tunnels and mining sites where mobile IoT devices exchange data on environmental conditions.

UNDERWATER IoT



Seamless integration of underwater IoT devices, connected through acoustic/optical modems to the surface segment, e.g., a gateway on a surface buoy.

GLOBAL IoT



Intelligent, automated, and scalable management of IoT devices and network functions across operators' and hyperscalers' jurisdictional domains.