CELTIC-NEXT

**Pitch of
the Project Proposal**

17th of March 2023, Paris

RAI6Green: Robust and AI Native 6G for Green Networks

KTH Royal Institute of Technology

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RAI6Green:
Robust and AI Native 6G Green Networks

Challenge: There is a trade-off between resiliency and energy-efficiency since extra resources are needed for resiliency. RAI6Green aims to achieve both resiliency and energy-efficiency at the same time.

- Robust 6G Networks
  - Resiliency against network failures and disasters
  - Reliability and availability of network services
  - Resiliency against power cuts
- Green self-sustainable networks
  - 3D spatial and temporal mobility prediction for extreme flexibility
  - Energy harvesting and flexible energy usage when no circuit power available
  - AI and ML integrated in all network segments: Benefiting fully from all energy-saving features 24 hours without fear of performance degradation

RAI6Green, Cicek Cavdar, KTH Royal Institute of Technology, Sweden & cavdar@kth.se

Organisation Profile

CELTIC-NEXT

KTH Royal Institute of Technology
Intelligent Network Systems Research Group- COS

- 1 Researcher, 6 PhD students, 2 Postdocs, 1 Project Manager
- 7 PhD graduates (2 as main supervisor)
- 5 Postdocs employed during 2016-2020

Strategic partnerships
- Ericsson, Airbus, Tele2, Orange, Turkcell

Research
- Vehicular Communications
- Green Mobile Networks
- Integrated Satellite, HAPs, terrestrial networks
- Network Architectures for 5G and Beyond: *Softwarization, Cloudification, Densification*
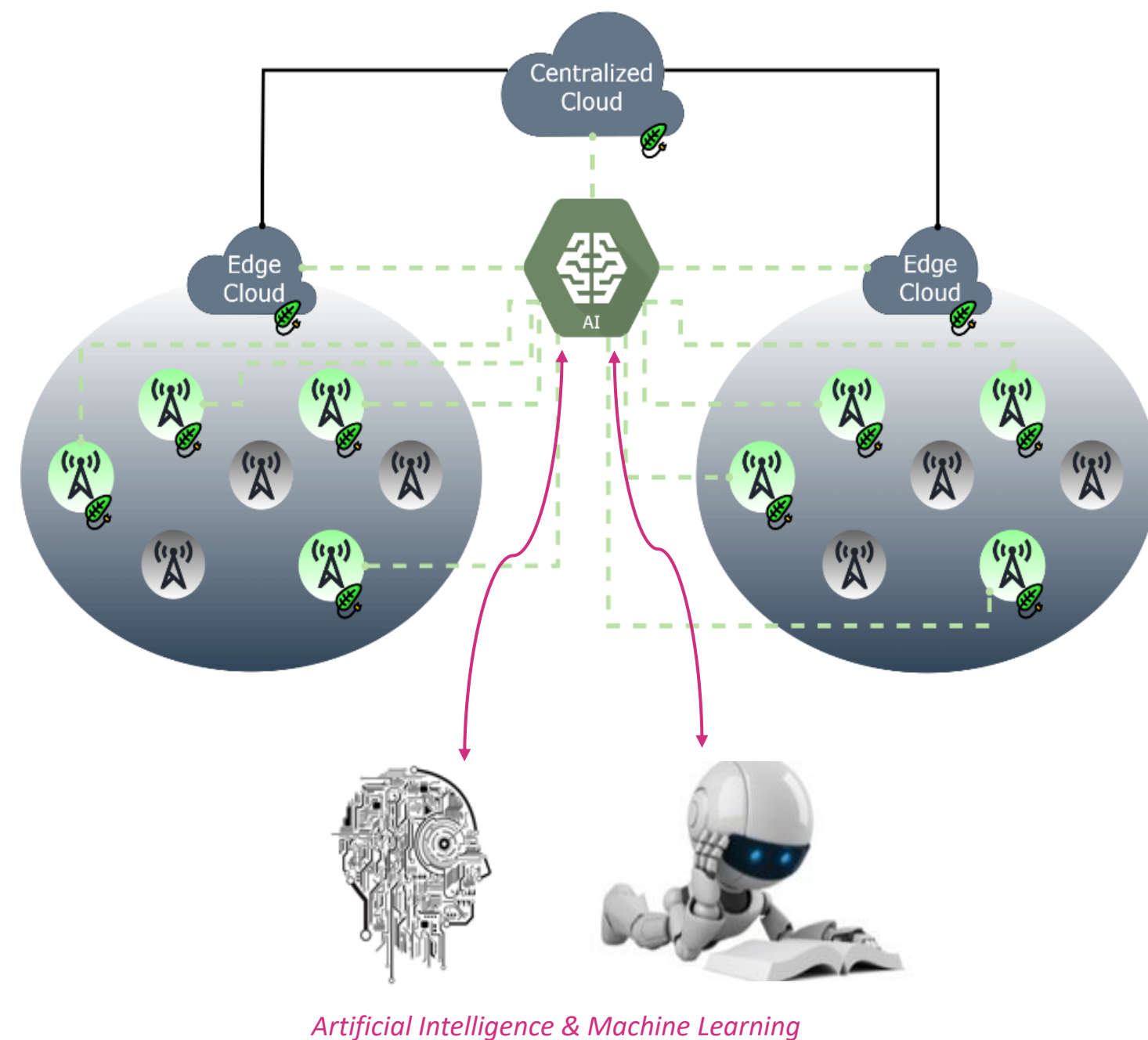- ML aided Wireless Networks

Director
Assoc. Prof. Cicek Cavdar

- *Recipient of 50MSEK external funding as PI (2014-2021)*
- *Technical Coordinator of EU projects 5Green, ICARO, AI4Green, 6G-SKY*
- *Teaching Wireless Networks, IoT…*

RAI6Green:
Robust and AI Native 6G for Green Networks

Artificial Intelligence & Machine Learning

- Green and flexible networks by design is possible:
  - Deeper and more sleep features,
  - Cloud and AI Native Network Architectures,
  - Open RAN with integrated sensing computing and communication features
  - Joint sensing communication and computing
- Robust and resilient networks
  - Fast reconfiguration and adaptation against failures
  - Flexibility in terms of changing and moving network topologies
  - Dynamic self-backhauling optimized together with the cloud and edge processing resources in O-RAN.
- AI enables parameter-free network management:
  - Learn from the environment and adapt the coverage and capacity instantly
- Self-sustainable networks integrated with Reconfigurable Intelligent Surfaces and Energy-harvesting
  - AI for energy resources management
  - Self sustainable reconfigurable intelligent surfaces
  - Green energy resources

Outcome and Impact

Expected outcome
- Demonstration of energy savings with ML and AI on live networks and digital twin
- Demonstration of robust flexible networks with high resilience to disasters and network failures
- Virtualized Open-RAN with integration of AI for cost and energy-efficiency

Impacts: Resiliency, Sustainability and Cost-efficiency

Project duration: 36 month

Start: Jan 2024

Partners

Consortium:
- Sweden (KTH, Tele2, Infovista)
- Finland (Unv-Oulu, VTT, Siemens)
- Turkey (Medipol Unv., TOBB Unv, Turkcell, PIWorks)
- France(Orange, IMT) (?)
- Portugal(CELFINET) (?)

Looking for:
- Industry partners – Network Operators, Research Inst.
- expert: live-network demonstrations and testing platforms, Open-RAN, Cloud and Fog networking, AI integrated networks, Safe ML

Contact Info

For more information and for interest to participate please contact:

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Presentation available via:

20th March 11 CET

Join the follow-up Telco

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