



REINDEER RESILIENT INTERACTIVE APPLICATIONS

THROUGH HYPER DIVERSITY IN ENERGY
EFFICIENT RADIOWEAVES TECHNOLOGY

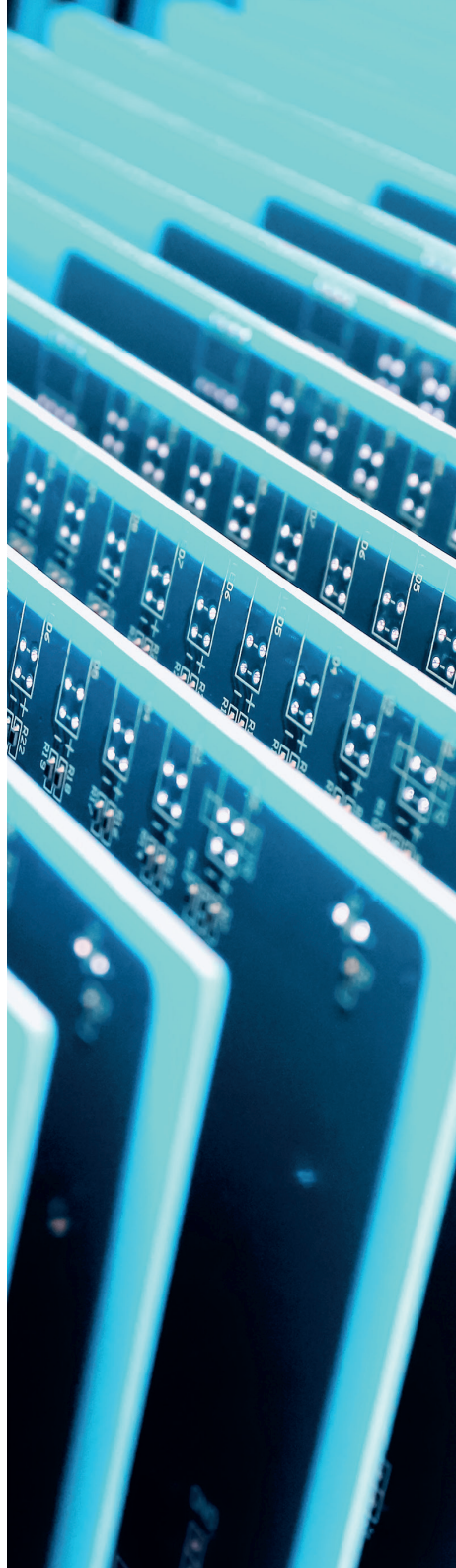


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About

The REINDEER project will develop a new smart connect-compute platform with a capacity that is scalable and offers perceived zero latency while interacting with an extremely high number of embedded devices. This is made possible through the development of, RadioWeaves technology, a new wireless access infrastructure consisting of a fabric of distributed radio, computing, and storage resources which function as a massive, distributed antenna array. REINDEER will develop protocols and algorithms to establish novel resilient interactive applications that require real time and real space cooperation, for future robotized industrial environments, immersive entertainment, and intuitive care. The project will co-design focusing algorithms and protocols for enhanced interaction with many energy-neutral devices powered wirelessly from the connectivity platform. REINDEER will provide experimental proof-of-concept in versatile testbeds. The project will reinforce the European technological leadership and the innovation will create new business opportunities.





Vision

REINDEER will develop a new type of smart connectivity platform creating hyper-diversity, designing cell-free protocols and distributed intelligent processing establishing robust and scalable real time and real space interactive applications. Operations in this infrastructure will use ultra-ef-

ficient energy and bandwidth solutions. Smart connectivity technologies for interactive experiences, with perceived zero latency and uninterrupted availability both in time and in location within the service operation.



Motivation

Many future applications will rely heavily on wireless connectivity to offer interaction in real time and real space with imperceptible latency and unnoticeable dislocation between virtual and real elements. Applications could include the remote medical expert wearing light-weight augmented reality (AR) glasses which can monitor the patient health data and control medical equipment. The glasses operate as an energy-neutral device. They receive HD video streams for the displays but all processing is off-

loaded to the infrastructure. Likewise, in manufacturing arenas, people and machines will cooperate, with an increasing number of robots and autonomous vehicles and drones. By 2030, one could expect merged realities where physical and virtual realities will be interchangeable. These applications will require unperceivable latency and high reliability. No retransmissions can be tolerated and zero outage is required in their operational environment.



Mission & Objectives

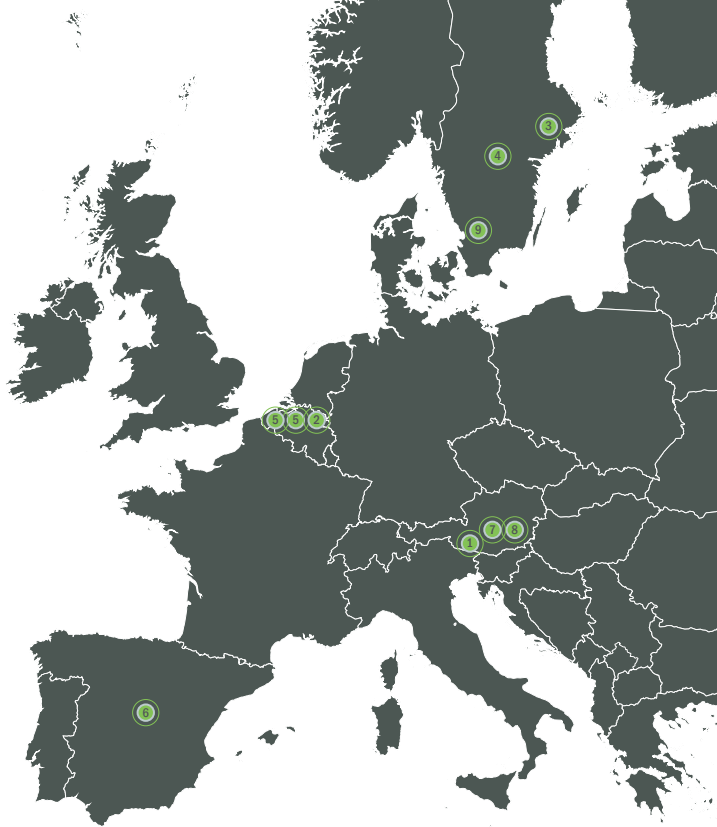
REINDEER will develop smart connectivity technologies for resilient interactive experiences, with perceived zero latency and uninterrupted availability both in time and in location within the service operation. The REINDEER project will bring essen-

tial innovation to progress both the platform architectures and the protocols and algorithms to realize the great potential in actual deployments and to establish future interactive applications. REINDEER will focus on the following objectives:

- To analyse and specify technical requirements for future **interactive applications** in industrial, care, and entertainment use cases.
- To develop the **transformational RadioWeaves smart connectivity platform** as energy-efficient, smart, scalable and secure connectivity infrastructure, and topologies for zero-outage and efficient and secure deployment.
- To develop scalable protocols and algorithms for **cell-free operation**, and signal processing solutions for **resilient interactive applications** and cooperation with 'energy-neutral' devices through pro-active diversity, location learning, and distributed intelligence.
- To experimentally **validate** and **demonstrate** the **RadioWeaves smart connectivity platform** and the REINDEER algorithms for robust applications and interaction with energy-neutral devices.
- To share the REINDEER results with a broad group of stakeholders and the scientific community, promote technological vision in pre-standardization activities, ensure **interoperability**.

Partners

The REINDEER consortium consists of nine partners from four countries (Austria, Belgium, Sweden and Spain). The consortium is a well-balanced mixture of three industrial organisations, four universities/research organisations and two SMEs. This constellation has enabled to attract leading organisations from the wireless networks sector in Europe as well as owners of real-time operational testbeds. The consortium brings together the necessary expertise to achieve the project objectives.



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TECHNIKON

Technikon Forschungs- und Planungsgesellschaft mbH
Austria [Villach]

4

li.u LINKÖPING
UNIVERSITY

LINKÖPINGS UNIVERSITET
Sweden [Linköping]

7

TU
Graz

TECHNISCHE UNIVERSITÄT
GRAZ
Austria [Graz]

2

**BLOO-
LOC**

BLOOLOC
Belgium [Hasselt]

5

KU LEUVEN

KATHOLIEKE UNIVERSITEIT
LEUVEN
Belgium [Leuven]
Belgium [Gent]

8

NXP

NXP Semiconductors Austria
GmbH & Co KG
Austria [Graz]

3

ERICSSON

ERICSSON AB
Sweden [Stockholm]

6

Telefónica

TELEFONICA INVESTIGACION
Y DESARROLLO SA
Spain [Madrid]

9

LUND
UNIVERSITY

LUNDS UNIVERSITET
Sweden [Lund]

Facts



Budget

€ 4.7 Million

100% EU-funded



Consortium

9 Partners

4 countries



Duration

42 Months

01/2021 - 6/2024

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Find out more about this Project:
<https://reindeer-project.eu/>