



CELTIC-NEXT

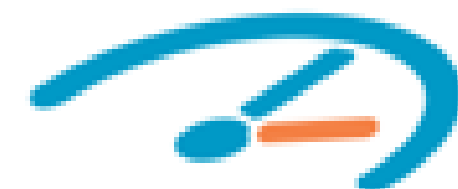
Pitch of

the Project Proposal

17th of March 2023, Paris

POSCA

POsitioning Services in Cellular Architectures

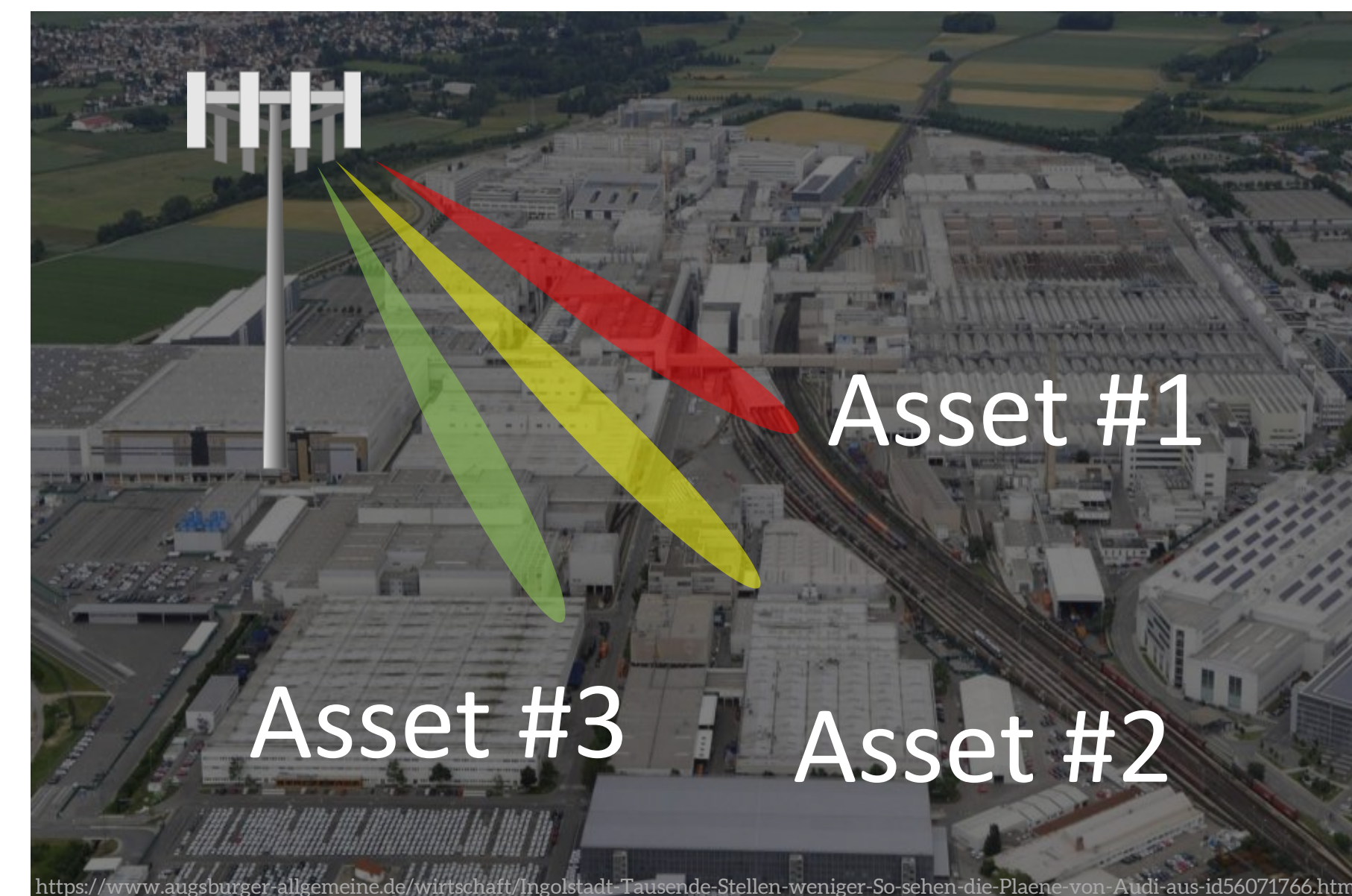
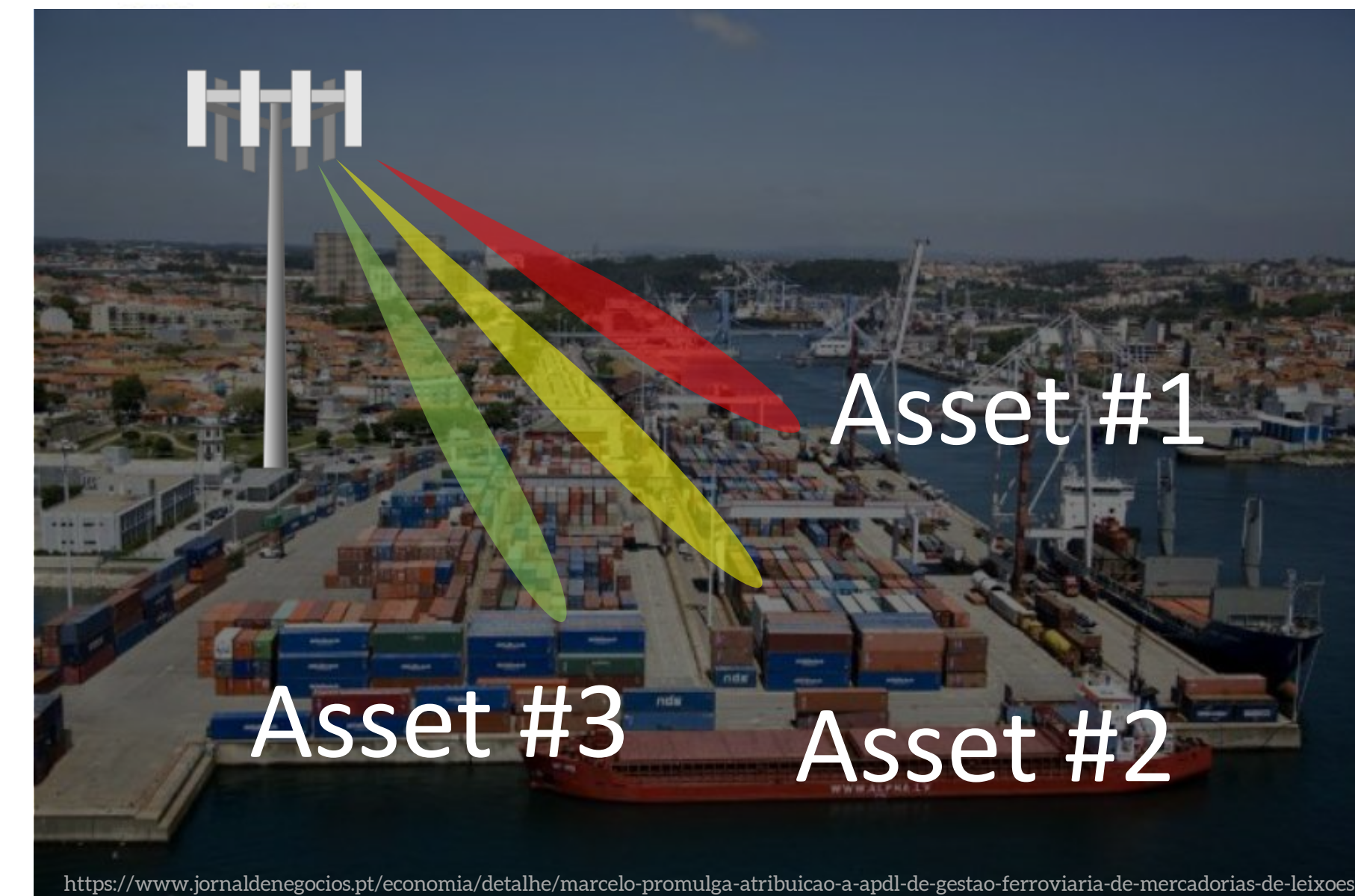


CISTER - Research Centre in
Real-Time & Embedded Computing Systems

Pedro Santos – CISTER Research Center (Portugal)
pss@isep.ipp.pt

Teaser

- Trend towards deploying 5G networks in private premises
 - **Non-Public Networks**
 - 5G as a **single communication solution to serve an entire campus** (instead of WiFi+ walkies+Ethernet...)
 - Where: Ports, production facilities, warehouses, etc.
 - Relevant applications: **asset tracking**.
- Technology-wise: MIMO solutions (and others) allow for positioning in cellular context
- How to integrate positioning services in cellular architectures?
- And: how to make positioning a possible cellular service?



Organisation Profile

- CISTER – Academic R&D Organization
 - Research Center in **Real-Time & Embedded Computing Systems**
 - Part of **University of Porto + Polytechnical Institute of Porto, Portugal**
 - Strong ties to major engineering schools and industrial ecosystem, both national and international
 - 25 Ph.D. researchers, 20 Ph.D. students, encompassing 20 nationalities
- Long record of participation in European projects & cooperation with companies
 - KDT JU (ADACORSA, VALU3S, ...)
 - Eureka ITEA4 (MIRAI, Smart-PDM, ...)



Run	Project Name	Funding	Global	CISTER	CISTER Coordinator
LEADER	ADANET-Autonomous Drones Assisted Internet of Things Networks May 2022 - May 2025 POCT-PTDC/EEI-COM/3362/2021		242KEUR	179KEUR	PE: Kati Li
PARTNER	IBEX-Quantitative methods for cyber-physical programming Jan 2022 - Dec 2024 POCT-PTDC/CCI-COM/4280/2021		250KEUR	74,9KEUR	CISTER Coordinator: José Proença
PARTNER	VALU3S-Verification and Validation of Automated Systems' Safety and Security May 2020 - Jul 2023	FCT, European Union	26,1MEUR	240KEUR	CISTER Coordinator: David Pereira
PARTNER	FLOYD-5G/SDN Intelligent Systems For Low latency V2X communications in cross-Domain mobility applications Jan 2021 - Jul 2023 ANAC n.º 04/51/2019 - Grant nr 045912 POCT-01-0247-FEDER-045912	ANI, European Union - Structural Funds, FCT, FCT, CMU	1.21MEUR	280KEUR	CISTER Coordinator: Eduardo Tovar
LEADER	RETINA-Real-Time support Infrastructure and Energy management for Intelligent carbon-Neutral smart cities Jan 2021 - Jul 2023 NORTE-01-0145-FEDER-000062	Norte 2020	499KEUR	243KEUR	PE: Eduardo Tovar
PARTNER	AMPERE-A Model-driven development framework for Highly Parallel and Energy-Efficient computation supporting multi-criteria optimisation Jan 2021 - Jul 2023 ICT-01-2019-RJA grant nr: 8/1469	European Union	5MEUR	326KEUR	CISTER Coordinator: Luis Miguel Pinho
PARTNER	FLY-PT-Mobilizar a indústria aeronáutica nacional para a disruptão no transporte aéreo urbano do futuro Jul 2020 - Jan 2023 Aviso 14/51/2019, Mobilizador nr. 46079 POCT-01-0247-FEDER-046079	ANI, COMPETE 2020, European Union - Structural Funds	8,19MEUR	195KEUR	CISTER Coordinator: Eduardo Tovar
PARTNER	MIRAI-Machine Intelligence techniques for smart and sustainable planning and operation IoT and Edge computing applications Dec 2020 - Jun 2023 N.º 069522		692KEUR	132KEUR	CISTER Coordinator: Pedro Miguel Santos
PARTNER	InSecTT-Intelligent Secure Trustable Things Jun 2020 - May 2023 H2020-ECSEL-2019-1-IA, Grant nr 8/6038 ECSEL/0002/2019	FCT, European Union	44,8MEUR	240KEUR	CISTER Coordinator: Ramiro Robles
LEADER	ADACORSA-Airborne data collection on resilient system architectures May 2020 - Apr 2023 H2020-ECSEL-2019-2-RIA, Grant Nr 8/6019 ECSEL/0010/2019	FCT, European Union	42,1MEUR	230KEUR	PE: Eduardo Tovar

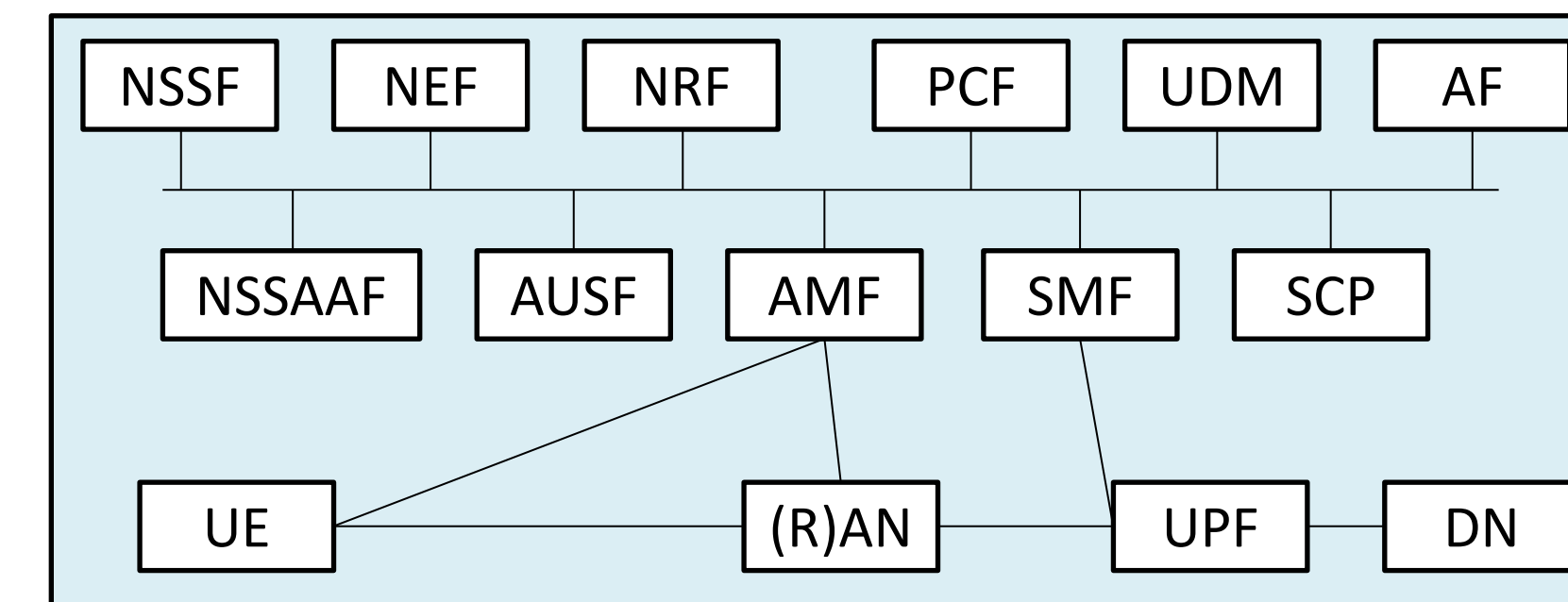
Check our Projects webpage:
<http://cister.isep.ipp.pt/projects/>



Project Proposal POSCA

- **POsitioning Services in Cellular Architectures – POSCA**

- To make positioning a service in cellular networks
- Open questions:
 - Q1: how good can positioning get in cellular contexts?
 - Q2: how to integrate the positioning service in the system architecture of 5G/xG?



5G System Architecture
(adapted from ETSI TS 123 501 V16.6.0)

- **In outdoor scenarios, what about GPS?**

- Traditional solutions require GPS + cellular radio
- **Having 5G/6G/xG offer positioning removes the GPS**, reducing power usage & price
- In the future, energy harvesting solutions could discard battery altogether

About POSCA



Outcomes

- Investigation of **current positioning accuracy in cellular technology (5G, 6G, xG)**; possibly proposal of new techniques
- **Retrieval of positioning data from RAN components** (or their implementation)
- Propose a solution to **integrate positioning data & services in 5G (6G, xG) architecture**

Impact

- **Positioning-as-a-Service** – interesting for the entire value chain in communications: Telcos, RAN OEMs, Core providers and, of course, end-users

Proposed duration: 36 months

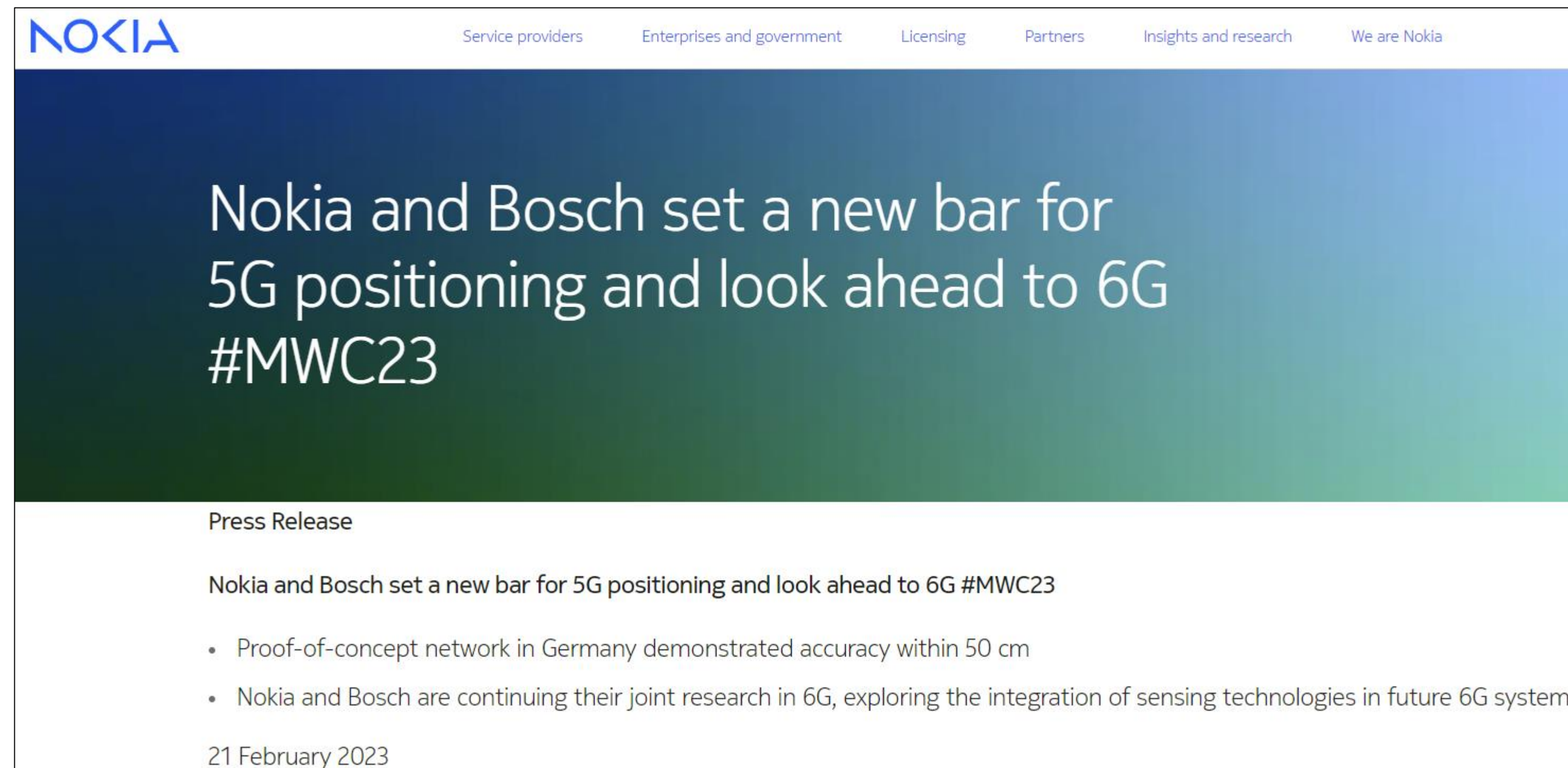


Where we're at

3GPP:

- Rel-17: use cases such as factory automation target 20-30cm location accuracy
- Rel-18: study on expanded and improved NR positioning

In the news:

A screenshot of a Nokia press release webpage. The header includes the Nokia logo and navigation links: Service providers, Enterprises and government, Licensing, Partners, Insights and research, and We are Nokia. The main headline reads: 'Nokia and Bosch set a new bar for 5G positioning and look ahead to 6G #MWC23'. Below this, it says 'Press Release' and repeats the headline. Two bullet points follow: 'Proof-of-concept network in Germany demonstrated accuracy within 50 cm' and 'Nokia and Bosch are continuing their joint research in 6G, exploring the integration of sensing technologies in future 6G systems'. The date '21 February 2023' is at the bottom.

NOKIA

Service providers Enterprises and government Licensing Partners Insights and research We are Nokia

Nokia and Bosch set a new bar for 5G positioning and look ahead to 6G #MWC23

Press Release

Nokia and Bosch set a new bar for 5G positioning and look ahead to 6G #MWC23

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21 February 2023

Looking for



- Partners who are...
 - Users/developers of 5G systems with good knowledge of architecture (e.g., telecom operators, R&D groups)
 - Users/providers of Radio technology (OEMs, telcos)
 - System integrators
 - End-clients (logistic & industrial operators)
- Open to join existing consortiums
- On our end:
 - Can provide 1 or more use-cases, together with national R&D and industrial partners (telcos, SMEs, UNIs)
 - Can act as tech provider of radio modelling (more experienced) or system integrator



Contact Info



For more information and for interest to participate please contact:

Pedro Santos, CISTER R&D Center

pss@isep.ipp.pt

00 351 93 321 81 15

Pedro Santos, CISTER Research Centre
ISEP - Instituto Superior de Engenharia do Porto
Rua Dr. António Bernardino de Almeida 431
4249-015 PORTO, Portugal

pmssantos.github.io / cister.isep.ipp.pt



Presentation available via:

