5G and beyond

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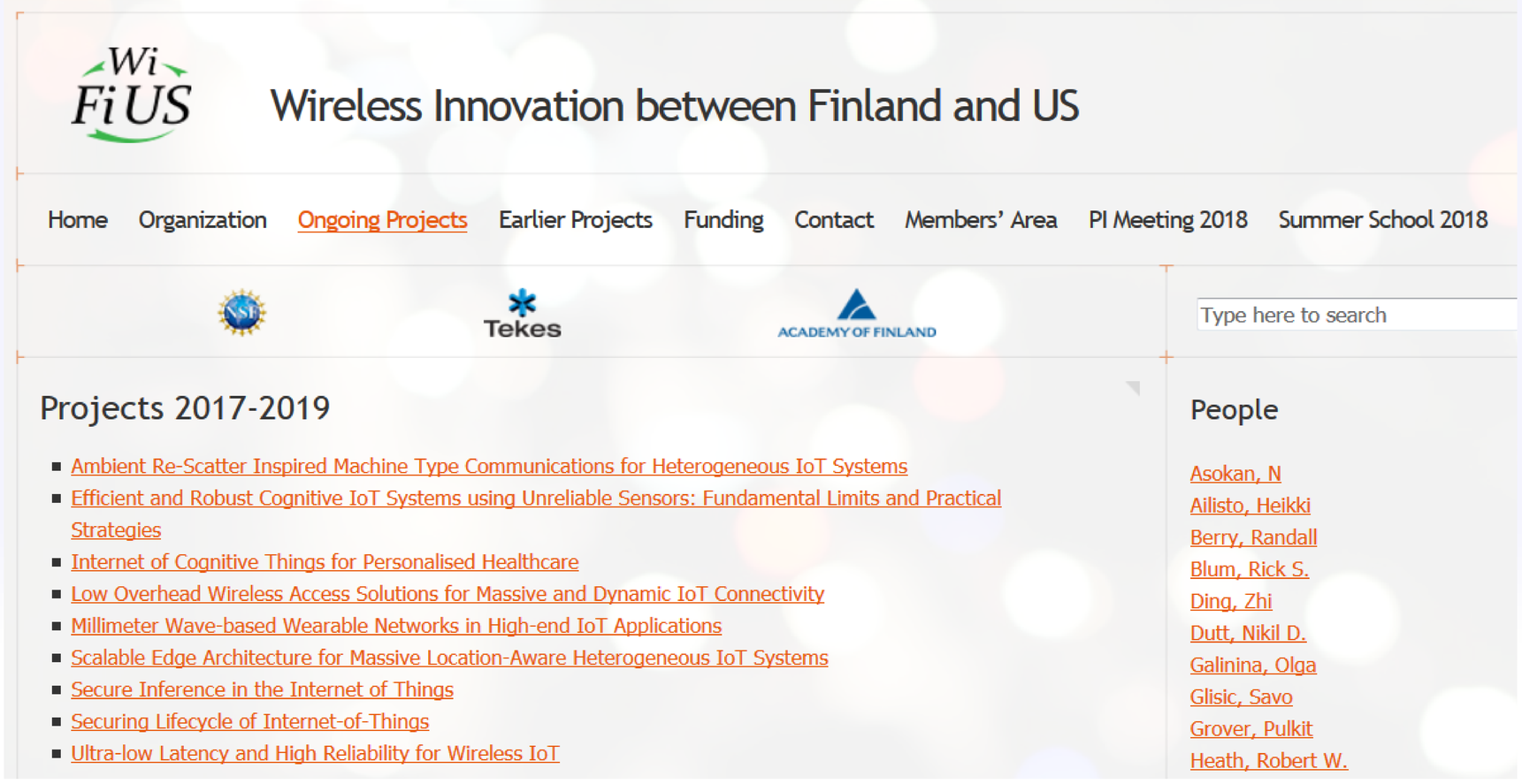
CWC
oulu.fi/cwc

Ongoing Collaboration between US and Finland

www.wifius.org

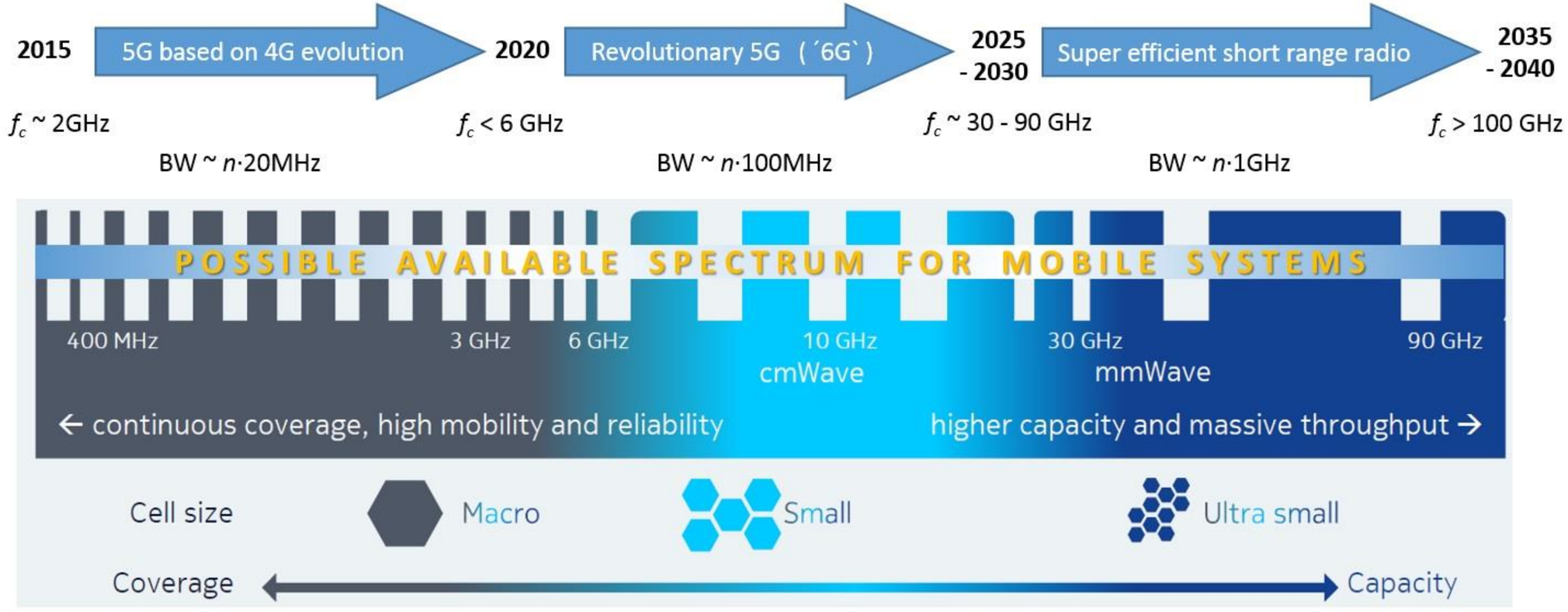
Around 30 funded projects since 2012



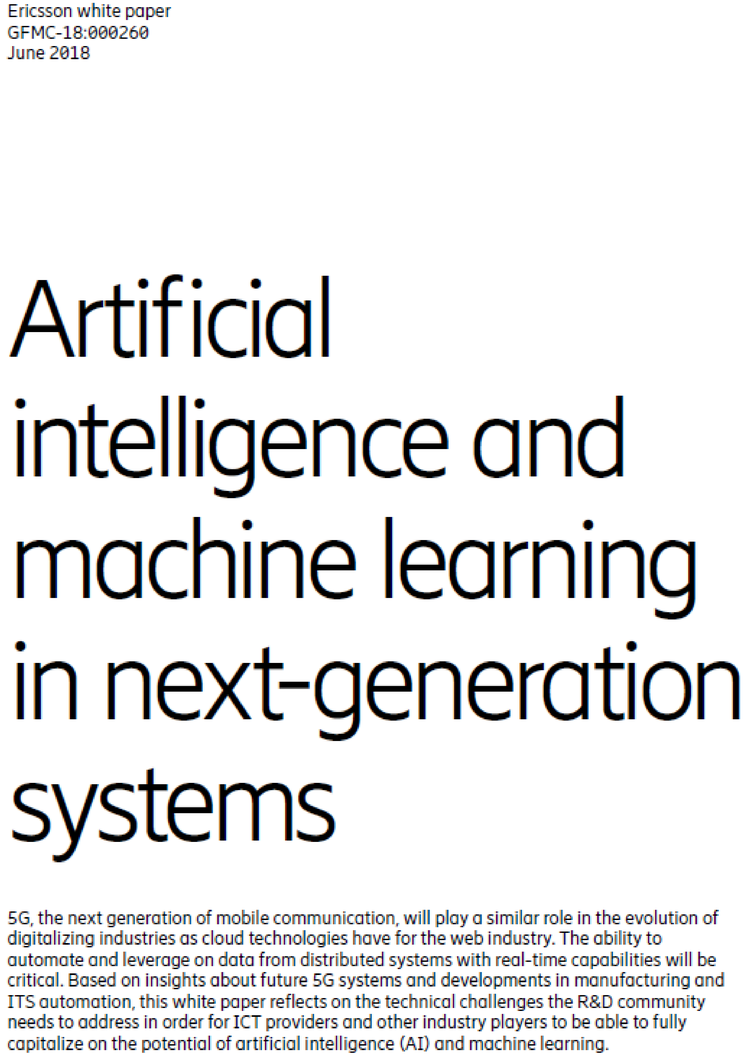
In 2013-2017 CWC's researchers have produced in total 211 joint publications with colleagues from 45 universities and research institutes in US reaching a citation count of 2 037.

Challenge #1: Communications Towards THz Spectrum

Our guess made in 2015:



Challenge #2: Distributed Intelligence



Due to highly dynamic nature of wireless systems, intelligence at the edge of network is essential to realize autonomous vertical applications.

Research challenges:

- Real-time intelligence
- Distributed and decentralized intelligence
- Machine learning & machine reasoning
- Human-machine interaction
- Safety, security and trust


6Genesis
6G Enabled Smart Society and Ecosystem
Finnish Flagship on Wireless Communications
for 2018-2026; volume 251M€
UNIVERSITY OF OULU
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#6Genesis @LatvaMatti
6Genesis
www.6genesis.org

6Genesis Focus Areas

Wireless Connectivity

Ultra-reliable low-latency communications

Unmanned processes

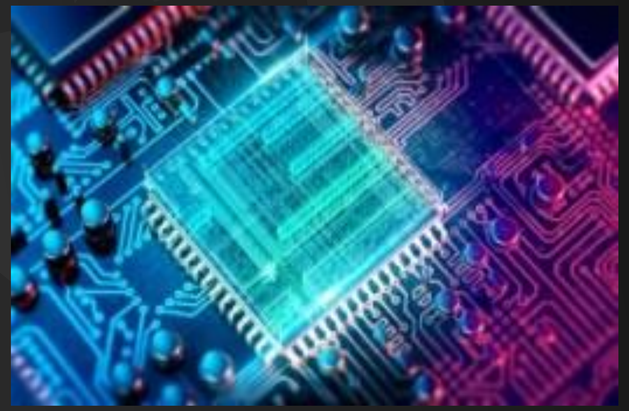
Distributed Computing

Mobile edge intelligence

Time critical & trusted applications

Devices & Circuit Technology

THz communications materials & circuits



Unlimited connectivity

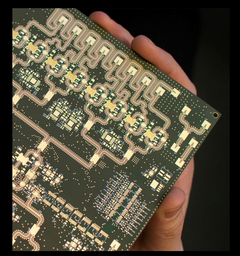
Services and Applications

Multidisciplinary research accross verticals

Disruptive value networks

Co-Creation via 5G Test Network

- Open test network for co-creation (https://5gtn.fi).
- Main parts located in Oulu & Helsinki regions.
- Was used in EU-Korea demos at 2018 Winter Olympic Games (http://www.oulu.fi/cwc/node/50700).
- Operator grade live network with plugged in 5G prototype radios.
- Near future targets: become the first operational local micro-operator at University of Oulu Digital Campus.



800 MHz @26/28 GHz
10 Gbps
Hybrid beamformer

5G PoC

IoT sensors

LTE Macros
with NB IoT

LTE small cell
@3.5GHz

5GTN SIM