Imec

IDLab - iWiNe SNS Brokerage event pieter.becue@imec.be

IDLAB, IMEC RESEARCH GROUP AT GHENT UNIVERSITY AND ANTWERP UNIVERSITY



NTERNET



Foundations System Applications



APP.

20 research teams, 50 professors, 60 post-docs, 200 PhD researchers, 40 staff members

iWiNe – Intelligent Wireless Networking GHENT UNIVERSITY



3

IDLab

GENT

່ເຫາຍດ

4→**6**→**7**→**8**→ ···







Usage and management of new features is left open.

Complex to assess real-life impact at design time.





A viable candidate for wireless TSN

- High data rate for fast Tx
- Natural extension of IEEE 802.1 TSN
- New features addressing TSN needs
- Cost-effective, lightweight architecture
- No indoor environment without Wi-Fi
- Can run in local licensed spectrum



New capabilities beyond communication such as localization & sensing.



COTS chips follow standardization.They behave as a black box with limited control.



Partial answers when relying on overly optimistic models and ignoring HW constraints. Specialized and customizable Wi-Fi innovation platform





Customizable Wi-Fi running on system-on-chip FPGA platforms From digital baseband to Linux driver



Baseline openwifi implementation: subset of Wi-Fi features available under AGPLv3 (https://github.com/open-sdr/openwifi)

Selected standard-compliant + advanced pre/non-standard (TSN) features: available via subscription model





UNIVERSITEIT

GENT

imec

IDLab

Mission-critical communication

AI/ML-based Technology Recognition & Traffic Characterization



Al/ML-based Radio Resource Management (4G/5G resource sharing, interference avoidance, flexible unicast/multicast...)





Advanced security solutions – Channel State Information (CSI) fuzzing

Universiteit

Antwerpen

 $\widehat{\mathbb{m}}$

GENT

UNIVERSITEIT

IDLab

່ເຫາຍດ



Research infrastructure: industrial IoT Lab



Context-awareness





vital sign monitoring Breathing and heartbeat



gesture recognition



activity recognition



object detection

occupancy awareness &



IoT – Edge – Cloud





Relevance for SNS calls



SNS-2025-STREAM-D – SNS Trials and Pilots (T&Ps) Vertical: industry/manufacturing (incl. robotics)

SNS-2025-STREAM-B-01-01: Advanced Architectures Systems and Technologies

Area 1: simplification of the architecture

STREAM-B-02: Wireless Communication Technologies and Signal Processing

Coexistence/sharing with other communication systems disaggregation in RAN

STREAM-B-04-02: Reliable Services Operation

Service technologies for time-sensitive and computationally intensive applications



- Simplified architecture for NPNs that better integrates with IT infrastructure (and IEEE tech)
- Convergence of Wi-Fi's architectural simplicity and 3GPP
- IEEE and 3GPP coexistence (in licensed & unlicensed spectrum)
- Wi-Fi radio access and O-RAN compliance
- Deterministic end-to-end communication and computing
- Real-time performance insights and application-network integration

umec

ເກາຍc

embracing a better life

UNIVERSITEIT GENT IDLab

mec

U

Universiteit Antwerpen