29ᵀᴴ WORKSHOP

THE FUTURE OF WIRELESS TECHNOLOGY

introduction at 13h15

Kris Hermus   Innovation program manager Flanders, imec

Founder & coordinator Wireless Community

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SUCCESS FACTORS

UNIQUE OFFERING

THE RIGHT BALANCE
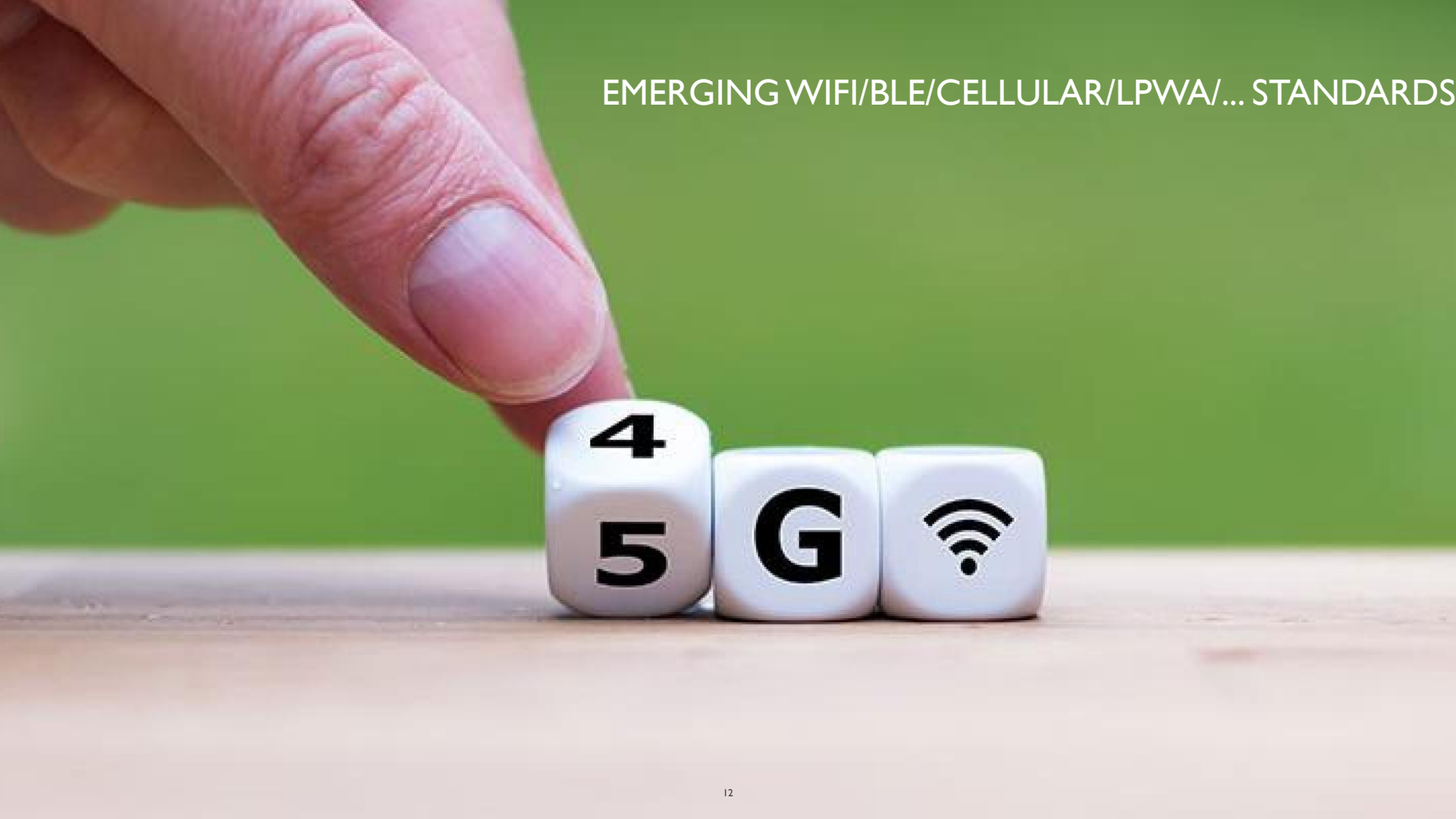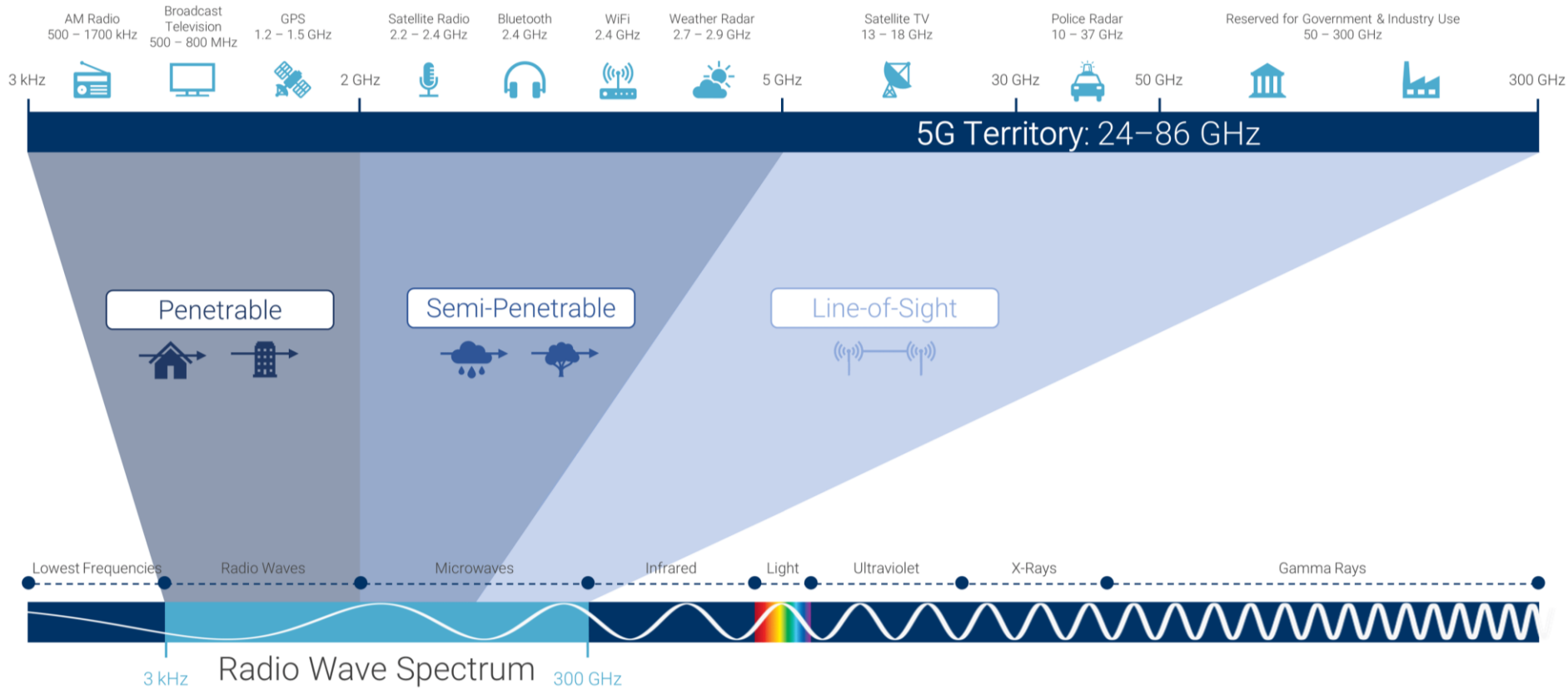
SPEED OF INNOVATION

WIRELESS FOR IOT

THE FUTURE IS BRIGHT

EMERGING WIFI/BLE/CELLULAR/LPWA/... STANDARDS

A SIXTH SENSE EXPERIENCE FOR HUMANS AND MACHINES, WHERE BIOLOGY MEETS AI

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AM Radio
500 – 1700 kHz

Broadcast
Television
500 – 800 MHz

GPS
1.2 – 1.5 GHz

Satellite Radio
2.2 – 2.4 GHz

Bluetooth
2.4 GHz

WiFi
2.4 GHz

Weather Radar
2.7 – 2.9 GHz

Satellite TV
13 – 18 GHz

Police Radar
10 – 37 GHz

Reserved for Government & Industry Use
50 – 300 GHz

3 kHz   2 GHz   5 GHz   30 GHz   50 GHz   300 GHz

5G Territory: 24–86 GHz

Penetrable

Semi-Penetrable

Line-of-Sight

Lowest Frequencies   Radio Waves   Microwaves   Infrared   Light   Ultraviolet   X-Rays   Gamma Rays

Radio Wave Spectrum
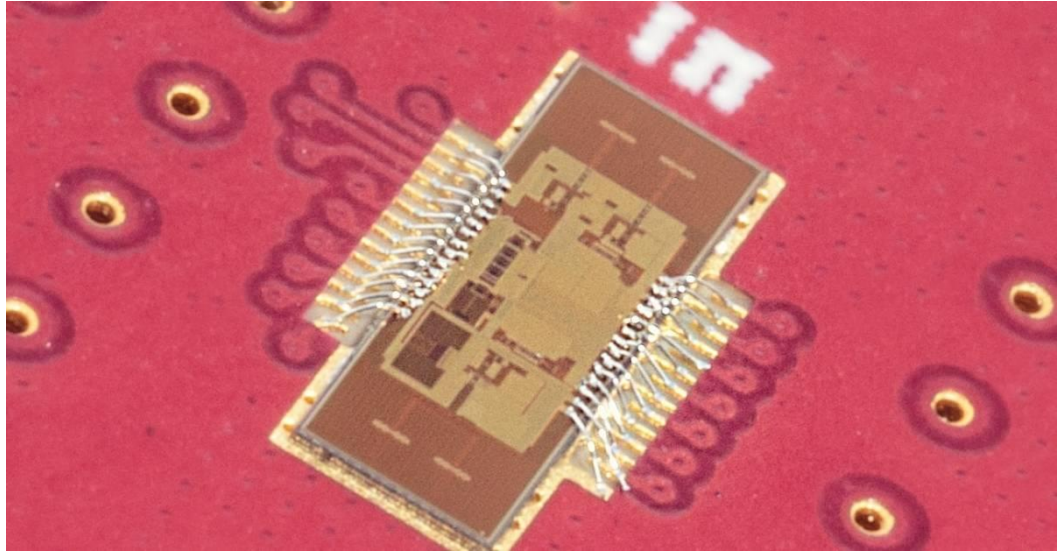
3 kHz   300 GHz

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TODAY'S LOCATION BASED SERVICES
3M ACCURACY FOR NON CRITICAL SERVICES

MINIATURSIATION
ON LOW COST CMOS AND HIGHLY INTEGRATED SYSTEMS-ON-CHIP

140 GHz
FMCW 28 nm transceiver
with on-chip antennas
to enable the next wave of highly miniaturized
high-resolution radar sensors

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RF SENSING

Driver monitoring

Simple volume& Channel control
Viewer presence detection

Part of an AR/VR experience
3D rendering

Gesture recognition

Audio tuning to the exact person
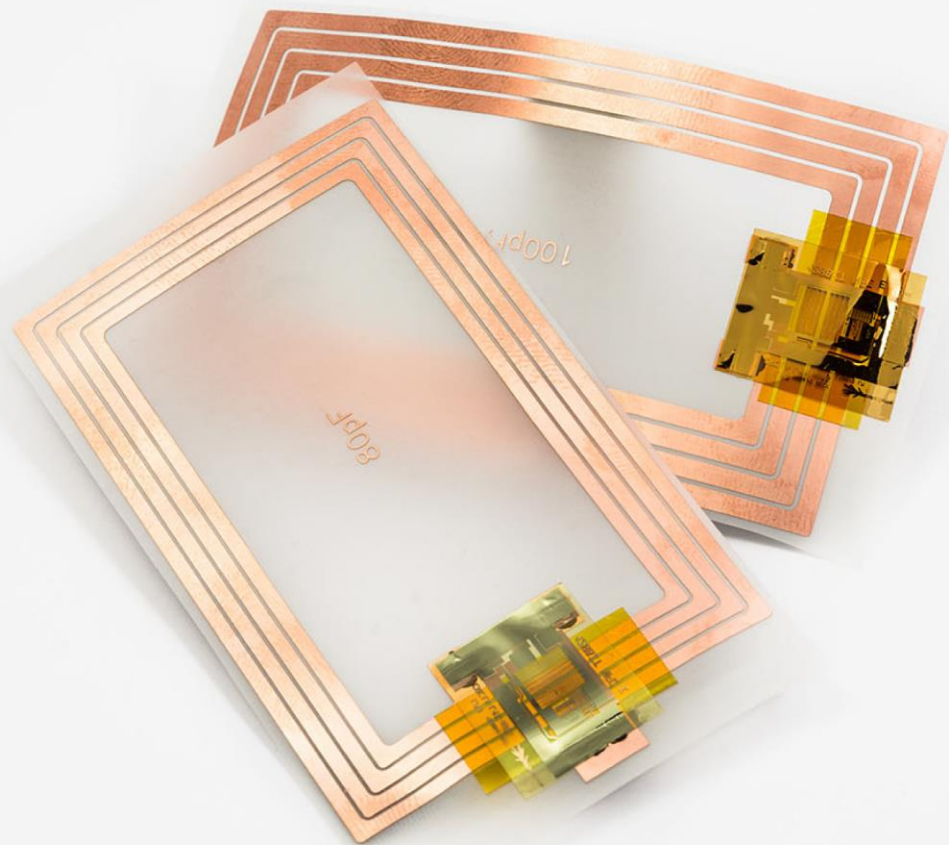position in the room

Vuzix photo
Hand/finger gesture controls

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TOWARDS INTUITIVE INTERACTION
ENABLED BY RF SENSING

gestures

respiration

activity recognition

people counting
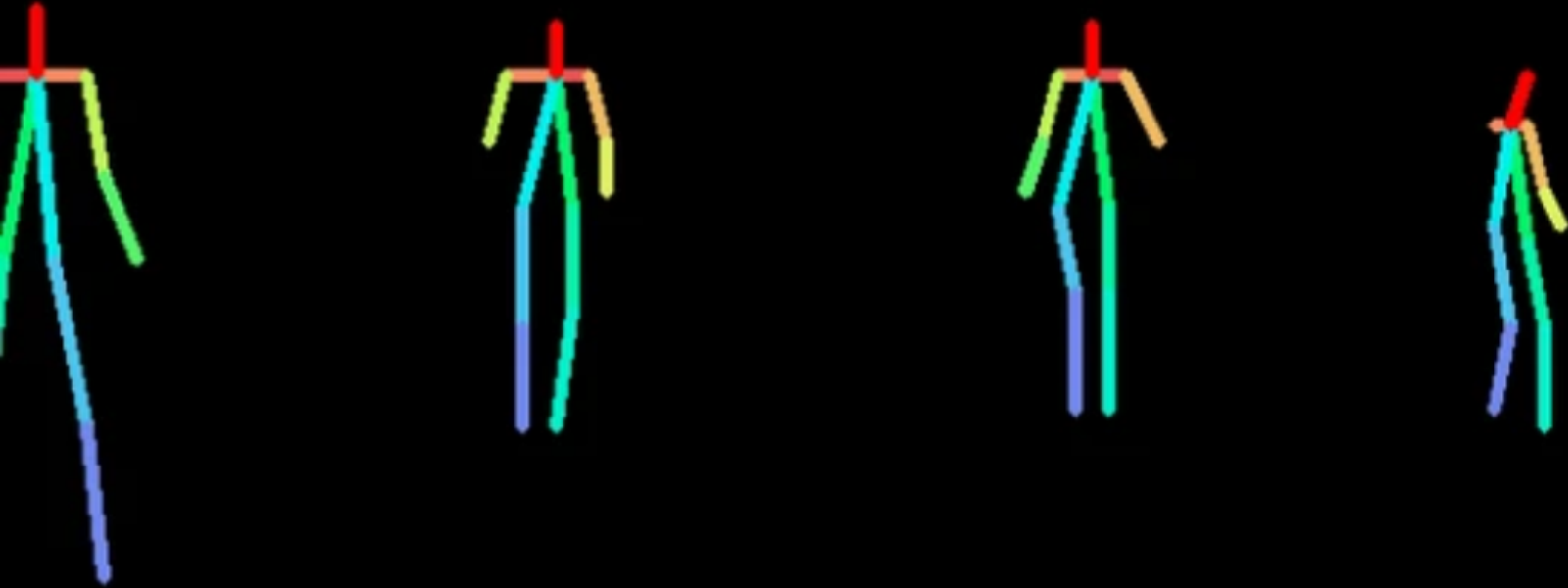
heart beat

(AMBIENT) RF ENERGY HARVESTING

Tim Marrs

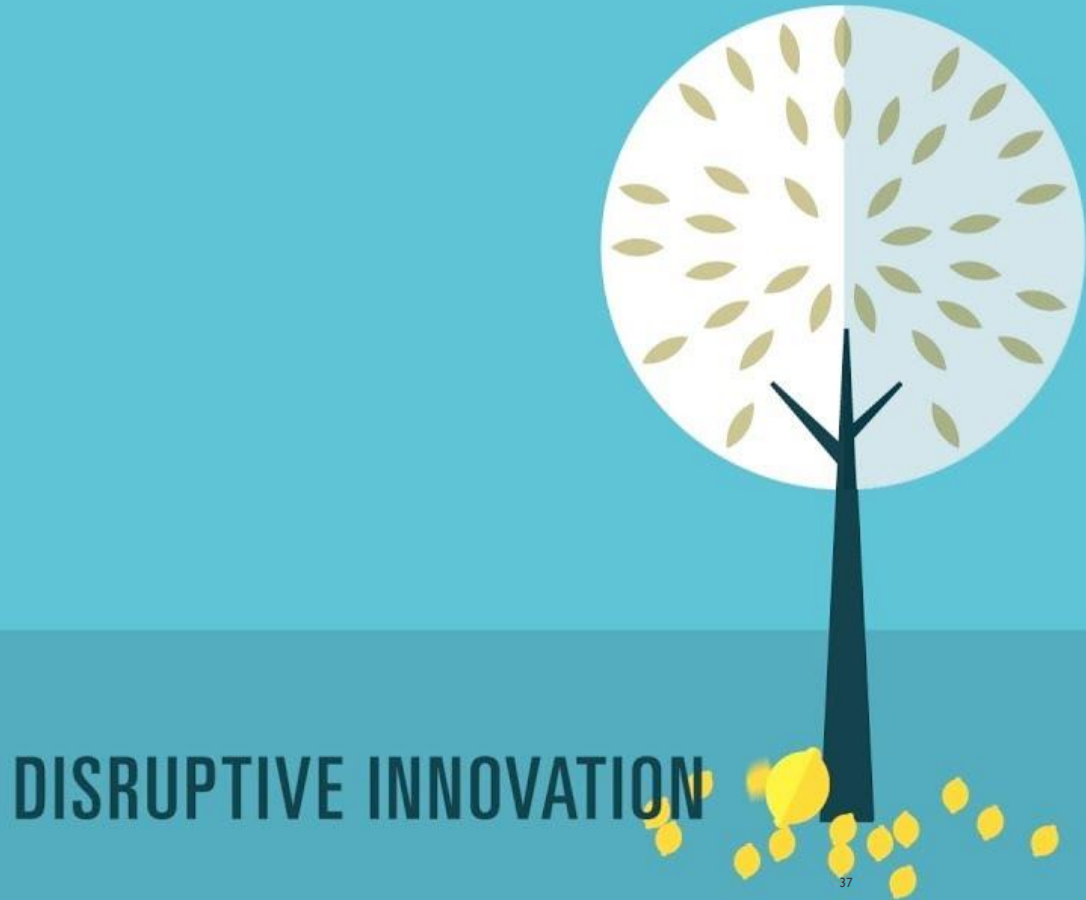AI WILL REVOLUTIONISE WIRELESS

WIFI + ML = DETECT PEOPLE THROUGH WALLS

EVERYTHING SMART (WITH WIRELESS)

~~FOUR~~ TEN MORE YEARS ???

DISRUPTIVE INNOVATION

Wireless LAB

Office Lab
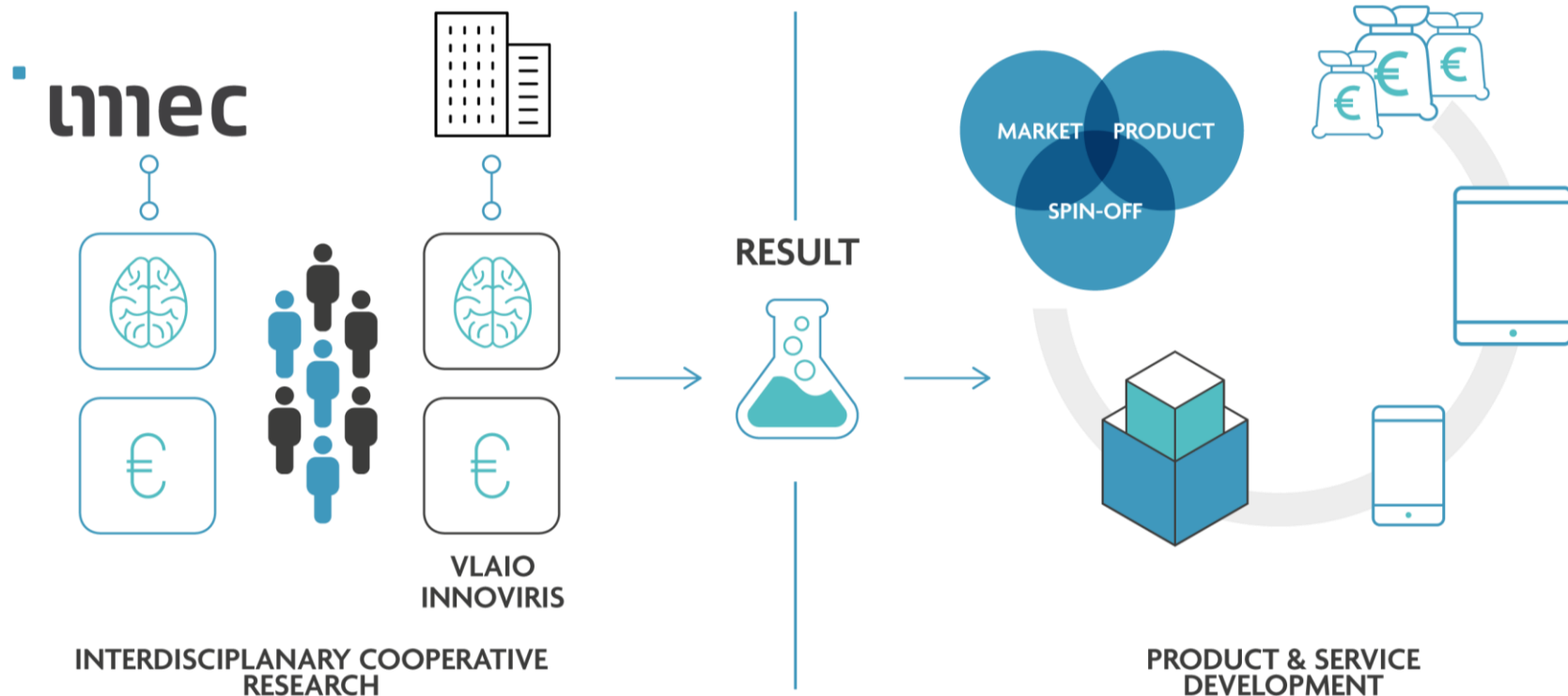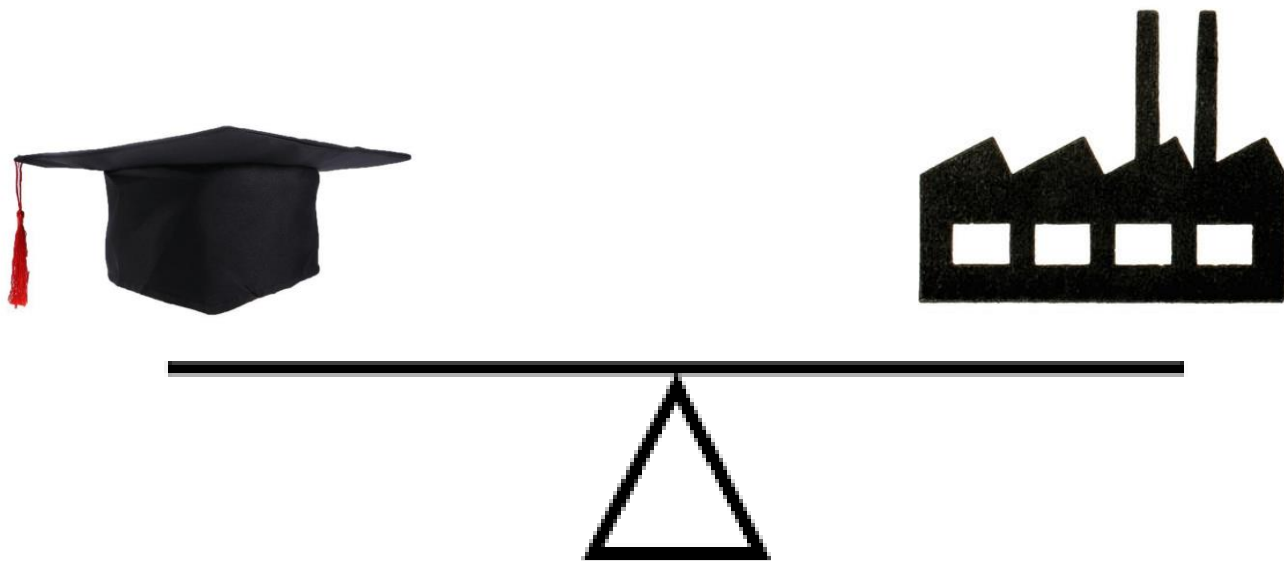
Smart Highway

CityLab

HomeLab

Factory Lab

IMEC.ICON
R&D COOPERATION WITH FLEMISH INDUSTRY

ROLE OF INDUSTRY IS CRUCIAL

PLEASE EMBRACE OPEN INNOVATION

JOIN US

... AND CONTRIBUTE

	Non-Members	Members
Annual fee	-	Companies: 300 EUR Academia: free
Access to workshop	80 ~ 100 EUR per person per workshop	Included (up to 10 employees per workshop)
Access to slides	attended workshop only	all slides of all workshops
Technological advice Partner search	-	Yes
Presentation	-	Yes*
Demo-booth	-	Yes*
Visibility	-	on website + flyer

*depending on availability and in line with topic of the workshops

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PLEASE REGISTER FOR OUR NEXT WORKSHOP

30ᵀᴴ WORKSHOP

TECHNOLOGIES
FOR
IDENTIFICATION AND 3D LOCALIZATION
OF ASSETS AND PEOPLE
IN INDUSTRIAL IOT ENVIRONMENTS

Friday 6 December @ imec - Leuven

TENTATIVE PROGRAMME FOR 6 DECEMBER

- **State-of-the-Art in Visible Light Positioning (VLP)**
  Nobby Stevens, Professor, KU Leuven-DraMCo

- **Multi-modal Communication & Localisation for Low-power IoT Applications**
  Raf Berkvens (TBC), Senior Researcher, imec-IDLab-UAntwerp

- **Sensor-Fusion for Accurate In-Door 3D Localisation & Identification**
  Kurt Geebelen, Senior Research Engineer, Flanders Make

- **SLAM: Visual Positioning in 3D**
  Dominck Vanthienen, VP Technology Innovation, Intermodalics

- **Angle-of-Arrival detection for accurate positioning with RFID**
  N.N., imec-IDLab-UGent

- **State of the Art in RFID-based Asset Identification**
  N.N.,

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PROGRAMME FOR TODAY

PROGRAMME - PART 1
AUDITORIUM

- **13:30**   **Beyond 5G: wireless communication in 2035**
  Michael Peeters

- **14:00**   **AI approach to battling spectrum scarcity in 5G-networks**
  Steven Latre

PROGRAMME - PART 1 (CONT'D)
AUDITORIUM

- **14:30** **Trends and evolutions for wireless indoor positioning**
Eli De Poorter, Professor, imec-IDLab-UGent

- **14:50** **High-Accuracy Distance Measurement
for standard Bluetooth Low Energy radio**
Jac Romme

- **15:10** **SHYN, the first wearable
for seamless 3D indoor and outdoor tracking**

- **15:25** **Coffee break + demos**

PROGRAMME - PART 2

ENTRANCE HALL

- **Demo 1**   **High-Accuracy Distance Measurement**
                   for standard Bluetooth Low Energy radios
                   imeca

- **Demo 2**   **OpenWiFi – An open-source**
                   fully customizable Wi-Fi implementation on SDR
                   imec-IDLab-UGent

- **Demo 3**   **SHYN, the first wearable**
                   for seamless 3D indoor & outdoor tracking
                   epic.blue

- **Demo 4**   **Locate your assets with shr-loc by Engie M2M – Sigfox Operator**
                   Engie M2M

- **Demo 5**   **NXP NxH3670, an ultra low power 2.4GHz audio streaming solution**
                   NXP Semiconductors

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PROGRAMME - PART 3
AUDITORIUM

- **16:00**   **The future of personal area networking**
  Jeroen Hoebeke

- **16:20**   **The future of LPWAN (for IoT)**
  Jeroen Famaey

- **16:40**   **The future of WiFi communication and sensing**
  Andre Bourdoux

- **17:00**   **WiFi HaLow, a revolution in wireless connectivity for IoT**
  Marleen Boonen

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www.wirelesscommunity.be

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