Canon Research Centre France S.A.S.

Global R&D

1 Canon Research Centre France S.A.S
Rennes, France
R&D of standard imaging and networking technologies

2 Canon Medical Research Europe Ltd
Edinburgh, U.K.
R&D of clinical decision support systems AI automation

3 Canon Production Printing Netherlands B.V.
Venio, Netherlands
R&D of large format commercial printers, medium and high speed printers for office use, etc.

4 NT-WARE Systemprogammierung GmbH.
Bad Iburg, Germany
Development and sales of print and scan management solutions

5 Milestone Systems A/S
Copenhagen, Denmark
R&D of video management solutions.

6 AXIS Communications AB
Lund, Sweden
R&D of network video solutions

7 Canon Medical Systems Corporation
Otawara (Tochigi), Japan
R&D of medical devices and systems

8 Canon Medical Research USA, Inc.
Illinois and Ohio, USA
R&D of core system physics, data acquisition, and image reconstruction hardware and software for medical devices and systems

9 Healthcare Optics Research Lab. (Canon USA)
Massachusetts, USA
Development of novel minimally invasive medical devices for image guided diagnosis and therapies

10 Canon Nanotechnologies, Inc.
Texas, USA
R&D of nanoimprint lithography systems

Canon Inc

Headquarters (Shimomaruko)	R&D Areas. Development of digital cameras, etc..
Yako Office	R&D of inkjet printers, large format printers, inkjet chemical products.
Kawasaki Office	R&D Areas. R&D of production equipment and dies, R&D of semiconductor devices, etc., R&D of network cameras.
Tamagawa Office	R&D of quality management technologies.
Kosugi Office	R&D of medical devices.
Hiratsuka Plant	R&D of displays and next generations devices.
Ayase Plant	R&D of semiconductor devices.
Fuji – Susono Research Park	R&D of electrophotographic technologies.
Utsunomiya Office	
Utsunomiya Optical Products Plant	R&D of semiconductor lithography equipment and FPD lithography equipment.
Optics R&D center	R&D of optical technologies.
Toride Plant	R&D of electrophotographic technologies, etc.

CRF BY NUMBERS

CANON BY NUMBERS (2023)

Located in Competitive Research Area for Image & Networking Rennes (FR)

Active participation to 4 major SDOs

Contributions: JPEG2000, DECT, Web services, HEVC, VVC, DASH, IEEE 802.11, 3GPP

34 years in business, Researching in image processing and networking

100% Canon Group affiliated company

336 consolidated subsidiaries worldwide

49 permanent staff (41 Engineers & PhD)

169,151 employees

€ 8.6 million Gross profit in 2024

$ 29,443 million net sales
$ 1,863 million net income

Industrial 7.5% **56.1%** **Printing**
Imaging 20.6% 13.2% Medical

80% Global R&D
20% BU specific

100% EU inspired

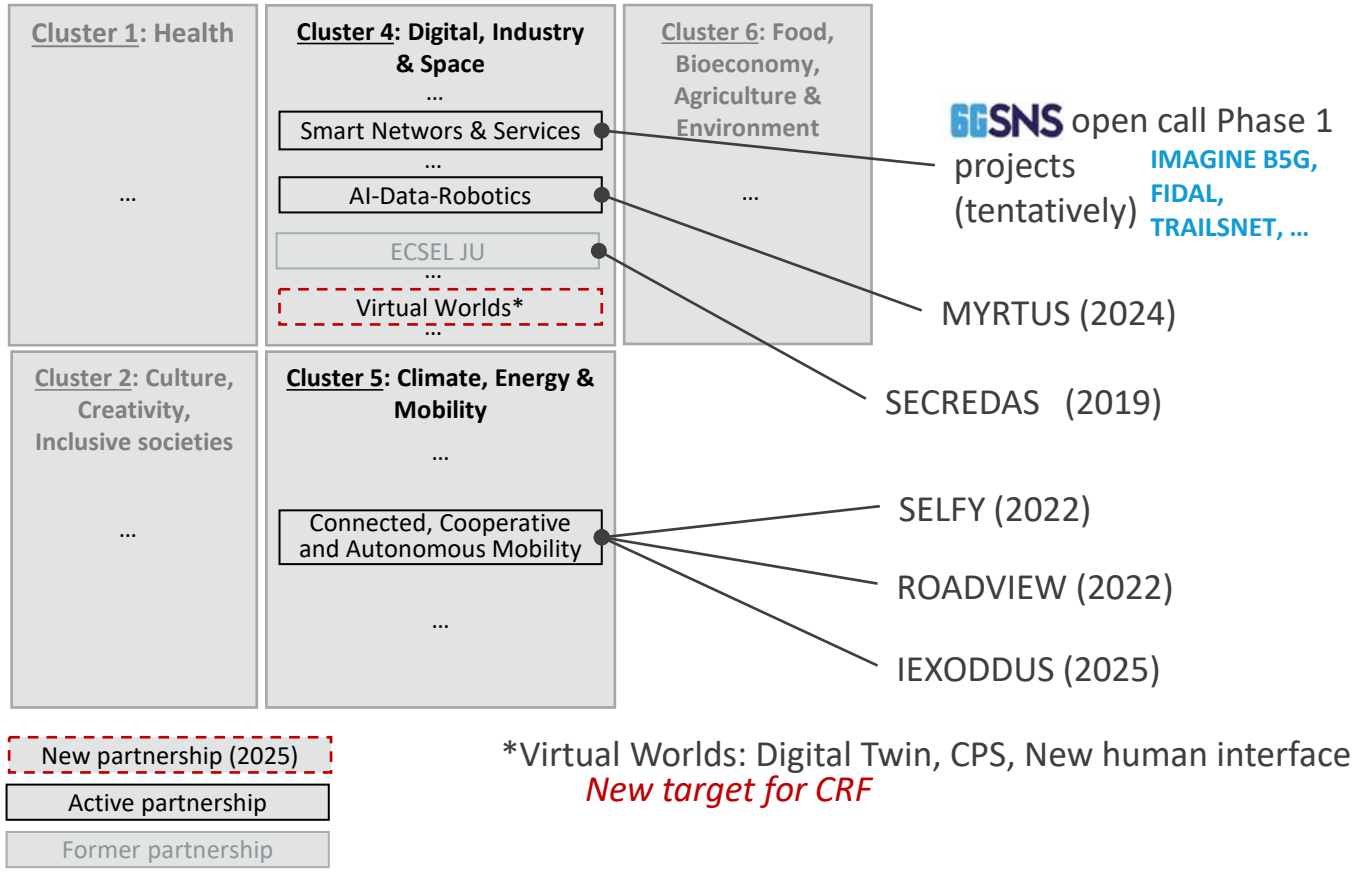
7.9% of net sales spent in R&D

https://global.canon/en/corporate/pdf/pdf/canon-story-2024-2025-e.pdf

Contribution to the EU R&D

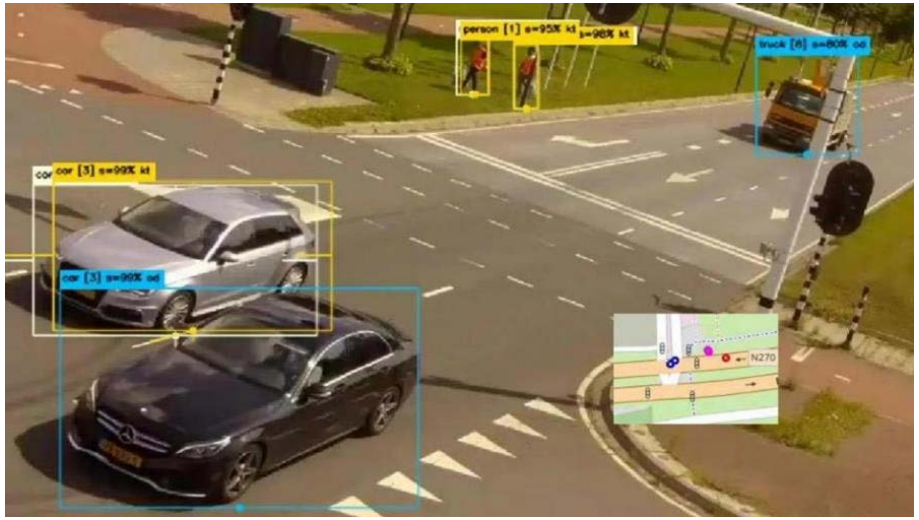
HORIZON EUROPE PILLAR II

Global challenges & European Industrial competitiveness



*Virtual Worlds: Digital Twin, CPS, New human interface
New target for CRF

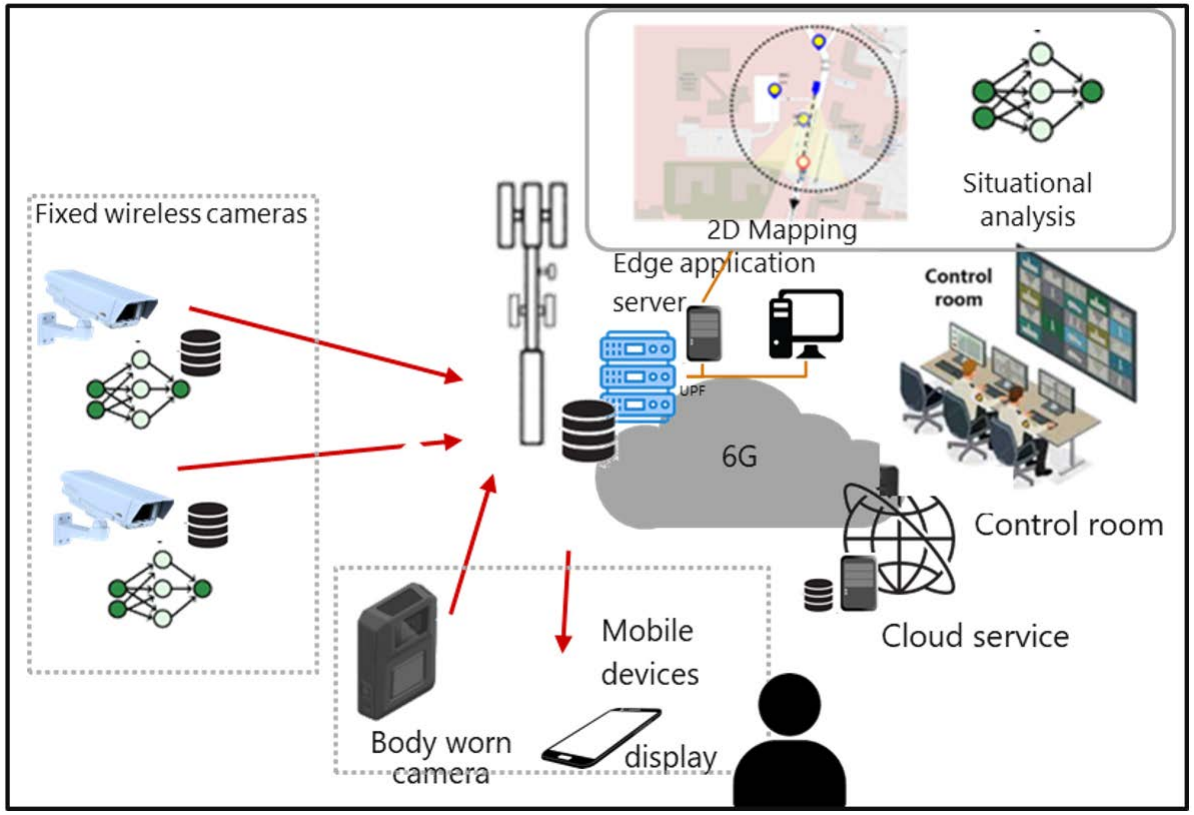
- **Technology developed by CRF**
  - Multi modal sensing: cameras, Lidars
  - Identification and tracking, by AI-powered VCAs
  - Geo mapping - Generation of C-ITS CPM messages
- **Specifications**
  - Detection: cars, trucks, buses, pedestrians, cyclists
  - Frequency: 10 fps
  - Position accuracy: 50 cm
  - Lighting conditions: Daylight – Weather adjustable



Verticals we aim at

- Industry/Manufacturing (i.e. process monitoring, AGV, AMR),
- Transportation / Logistics, C-ITS
- Emergency and Safety Services
- Health care

CRF's multi camera solution for SNS



CRF assets

Multi camera system

Misbehavior, abnormal situation detection

Accurate 3D geo mapping

Precise time & space positioning

3 roadside cameras at one road intersection (Helmond City video surveillance system)

Pose estimation

Camera calibration

RTK GNSS

Distributed AI

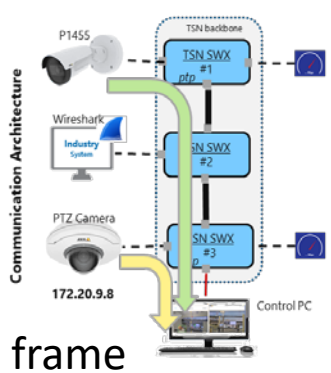
Embedded AI

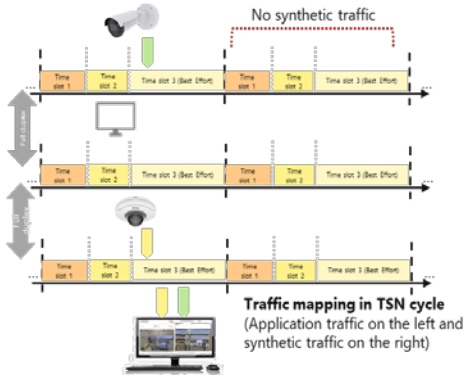
Object detection / recognition

Sensor fusion (LiDAR)

Time sensitive networking

(802.1AS, .1Q, .1Qbv, etc .)



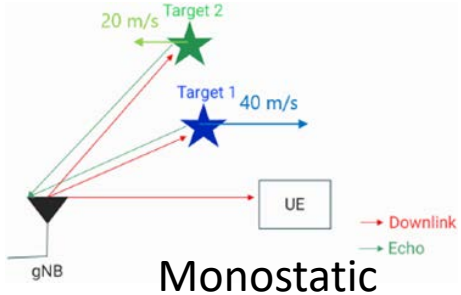


Video frame synchronization

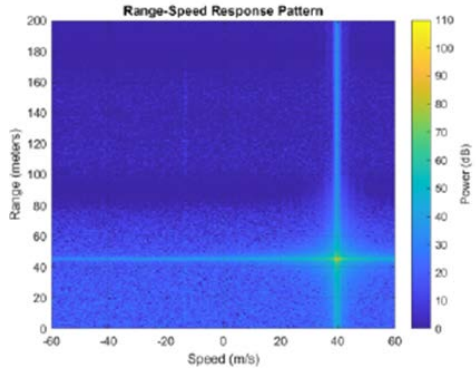
OPC/TSN camera

ISAC simulation (5G NR)

OFDM waveform analysis



Monostatic



Technologies of interest

- Multistatic sensing with UE in the loop, ISAC & multi camera system fusion
- Bitrate control, congestion avoidance, for efficient video streaming, e.g. L4S based
- Multi camera system optimization in dense environment, e.g. leveraging NOMA, RSMA
- AI based time sensitive multi camera system processing, leveraging network for AI

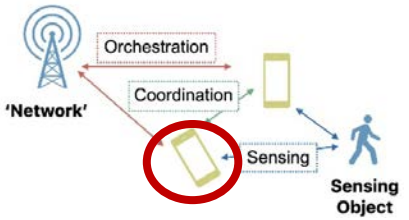
The 6G key features to boost future business

SNS Call 2025

- **STREAM-B-01-01:** Disruptive Technologies for 6G
  - B-01-01-01: Advanced Architectures Systems and Technologies
  - **B-01-01-02: Advanced IoT and Device Technologies**
- **STREAM-B-01-02: Wireless Communication Technologies and Signal Processing – Standardisation and Follow-up/PoCs**
- STREAM-B-01-03: Communication Infrastructure Technologies and Devices
- **STREAM-B-01-04:** Reliable Services and Smart Security– Standardisation and Follow-up/PoCs
  - B-01-04-01: Smart Security / Security Services
  - **B-01-04-02: Reliable Services Operation**
- STREAM-B-01-05: Microelectronic – Front-End Module (FEM)
- STREAM-B-01-06: EU-US International Collaboration
- STREAM-B-01-07: EU-IND International Collaboration
- STREAM-C-01-01: 6G Telco Cloud and Service Provision enablers
- **STREAM-D-01-01: SNS Trials and Pilots (T&Ps) with Verticals**

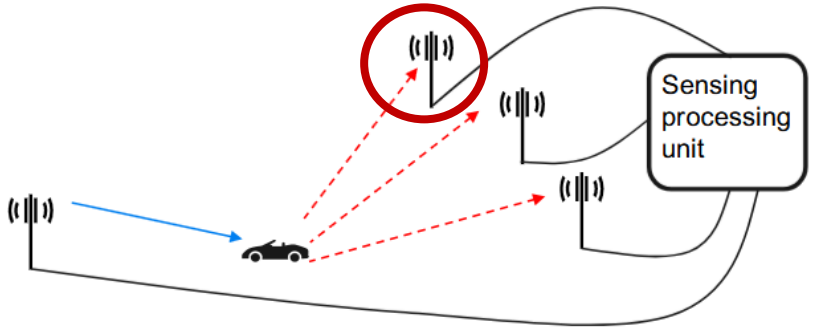
- ISAC algorithm & protocols
- Use case
- PoC, demonstrator and trials
- Standardization

Immersive sensing use case(s)



- Distributed/collaborative sensing leveraging local sensing information (multi-static) and edge processing (fusion)

- **Vision aided, where camera is one synergic UE, embedding collaborative sensing capability**



Source: Hexa-X-II, D4.3, page 113-123

- Create PoC (FR3, FR2) together with partners willing to study antennas, ISAC waveforms and associated algorithms, having UE in the loop.

- Complementary to localization

References:

- Hexa-X II, D4.3: Final Results of 6G Radio Key Enablers
- Hexa-X II, D5.5: Final design of enabling technologies for 6G devices and infrastructure
- Hexa-X II, D5.5: Final Results of 6G Radio Key Enablers

Thank you

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