ELEKTRONIKAS UN DATORZINĀTŅU INSTITŪTS

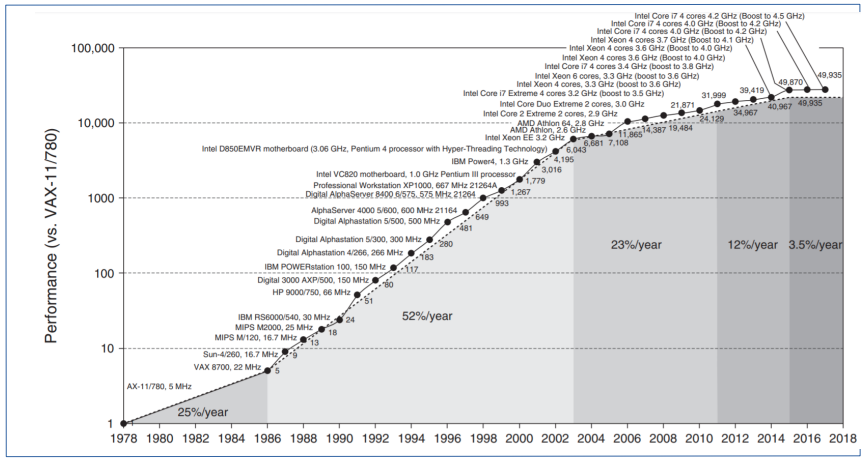
INSTITUTE OF ELECTRONICS AND COMPUTER SCIENCE

Institute of Electronics and Computer Science

Dr. Rihards Novickis
rihards.novickis@edi.lv
+371 67558288
14 Dzerbenes st., Riga, Latvia, LV1006

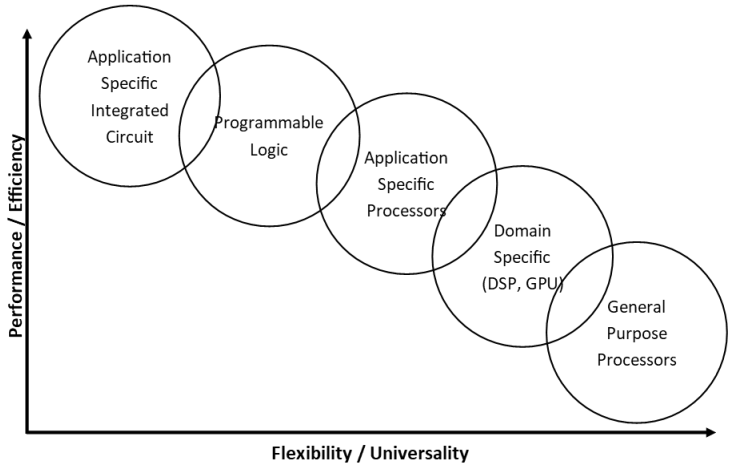
- State research institute
- Founded in 1960
- 80+ scientific personnel
- https://www.edi.lv/
- Specialization in the development of Smart Embedded Cooperative systems in:
  - Extremely precise event timing
  - Remote sensing and space data processing
  - Robotics and machine perception
  - Signal processing and embedded intelligence
  - Smart sensors and IoT

Embedded Intelligence (COMP4DRONES)

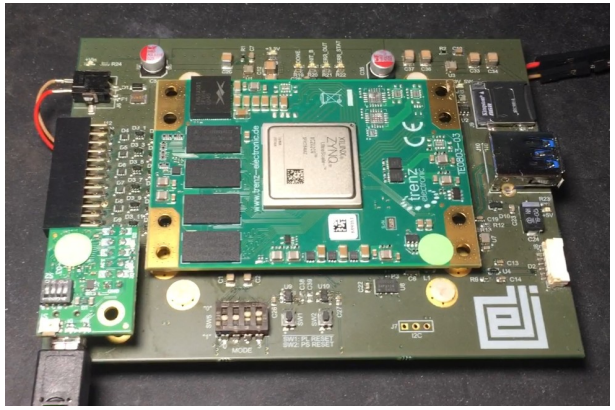


Performance saturation.

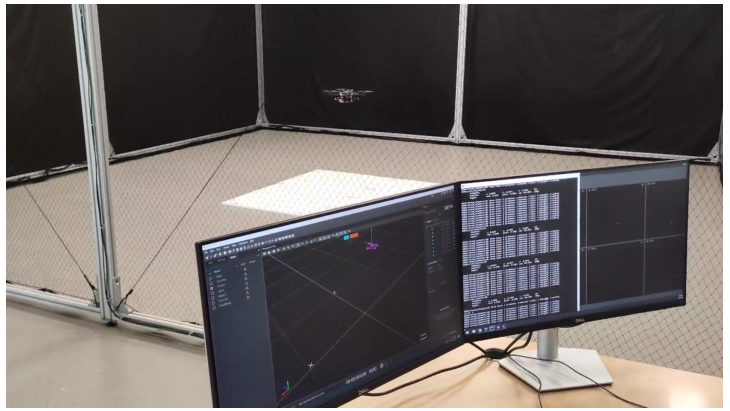
Specialization



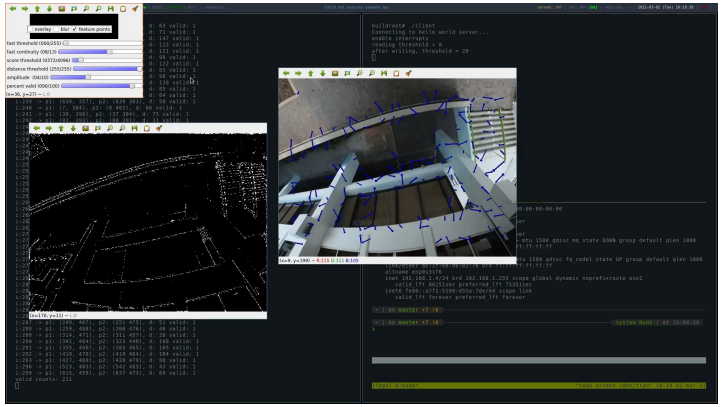
Universality vs Performance.



Custom electronics, MPSoCs + FPGA.



Drone prototype, first autonomy test.

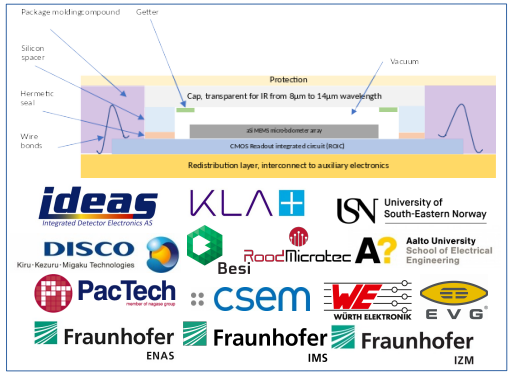


Algorithm acceleration, optical flow.

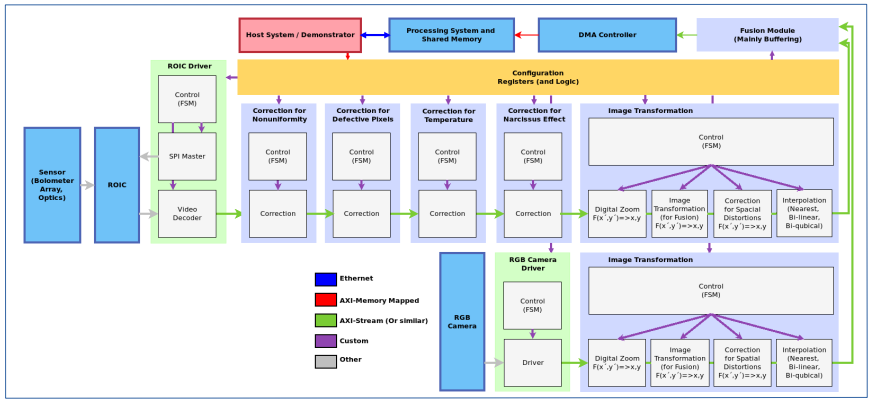
This project has received funding from the ECSEL Joint Undertaking (JU) under grant agreement No 826610. The JU receives support from the European Union's Horizon 2020 research and innovation programme and Spain, Austria, Belgium, Czech Republic, France, Italy, Latvia, Netherlands.

IC design (APPLAUSE)

This project has received funding from the ECSEL Joint Undertaking (JU) under grant agreement No 826588. The JU receives support from the European Union's Horizon 2020 research and innovation programme and Belgium, Germany, Netherlands, Finland, Austria, France, Hungary, Latvia, Norway, Switzerland, Israel.

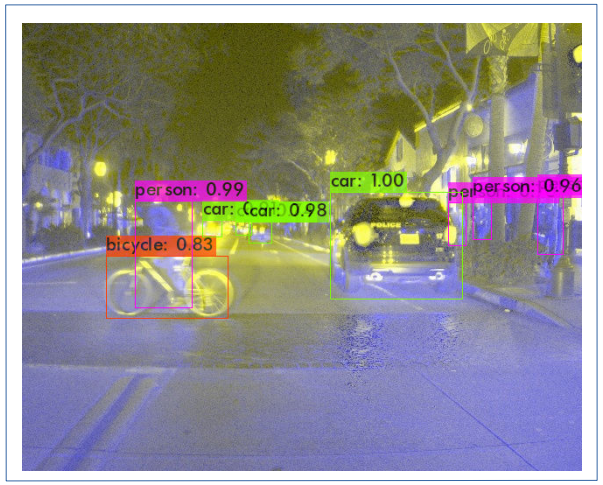


IR sensor design up to interfacing circuit.

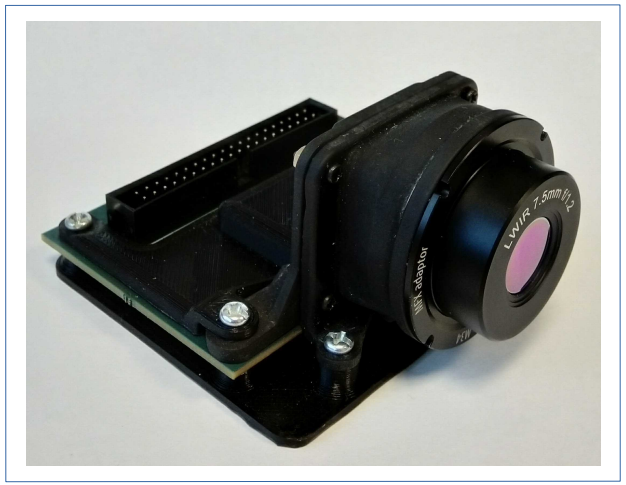


System architecture, including readout, non-uniformity correction, defective pixel correction, lens distortion correction, IR/RGB registration.

Algorithm design and implementation in digital hardware (FPGA/ASIC)



RGB/IR fusion demonstration.



Prototyping (PCB, 3D casing, optics, calibration)

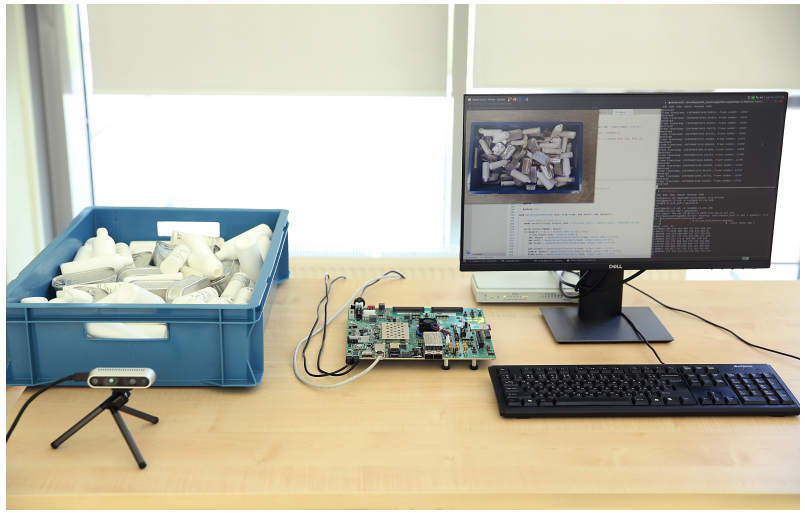
APPLAUSE

ECSEL Joint Undertaking

Smart Robotics (AI4DI)

"AI4DI receives funding within the Electronic Components and Systems for European Leadership Joint Undertaking (ESCEL JU) in collaboration with the European Union's Horizon2020 Framework Programme and National Authorities, under grant agreement n° 826060."

Artificial Intelligence for Digitizing Industry



FPGA DNN demonstrator.

Synthetic data generation.

AI-based multi-modal cognitive sensing:

- Object detection and pose estimation on edge device using a validated AI computer vision system;
- Radar-system embedded gesture recognition for contactless human-robot interaction;
- Touch event identification using deep learning-based algorithm on sensitive robot skin.

EDI competencies:

- Object detection, recognition, classification, pose-estimation for manipulation tasks (deep learning based);
- Synthetic data generation
- Embedded intelligence
- Smart robot control – working in dynamic conditions, adaptive planning.

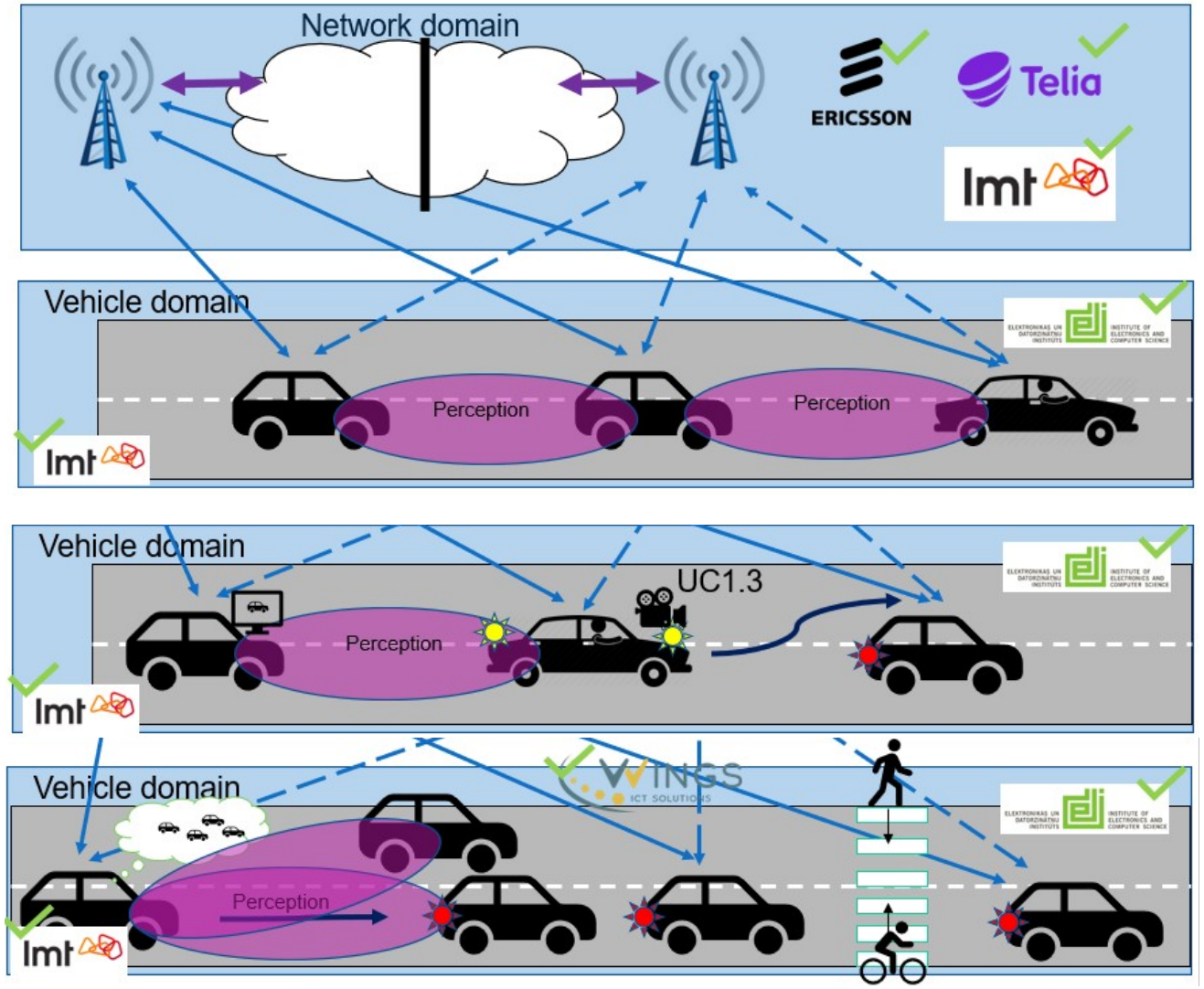
Connected and automated mobility (5GROUTES)

Enablers

UC1.1: Dynamic vehicles platooning

UC1.2 Cooperative lane change

UC2.2 Traffic jam chauffeur



5th Generation connected and automated mobility cross-border EU trials

EDI competencies:

- Drive-by-wire system;
- Multi-sensor (radar, lidar, cameras etc.) perception, data fusion, AI based analysys;
- 5G based V2X communication

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 951867

ELEKTRONIKAS UN DATORZINĀTŅU INSTITŪTS

INSTITUTE OF ELECTRONICS AND COMPUTER SCIENCE

Thank you!

Dr. Rihards Novickis
rihards.novickis@edi.lv
+371 67558288
14 Dzerbenes st., Riga, Latvia, LV1006