

# NEW CONTROL

NewControl developed virtualized platforms for each vehicular sub-system essential to autonomous operation at SAE Level 3+. Each of these unifies critical components required to realize a specific function – perception, cognition, control – through vertical integration within an adaptive architectural framework. The virtual platforms effectively deliver specific functionalities as services to the vehicular platform, to enable portability to different application domains, and facilitate modular development of automation.

## NewControl SC6: Adaptive fail-operational control applied to highly automated road vehicles

### Demonstrator: Construction site parking

Ford Otosan demonstrated fail-operational driving and reverse parking in a quarry. The vehicle drove itself in an open-pit mine from a loading point to an unloading point and performed reverse parking to the docking zone.



### Demonstrator: Garage parking

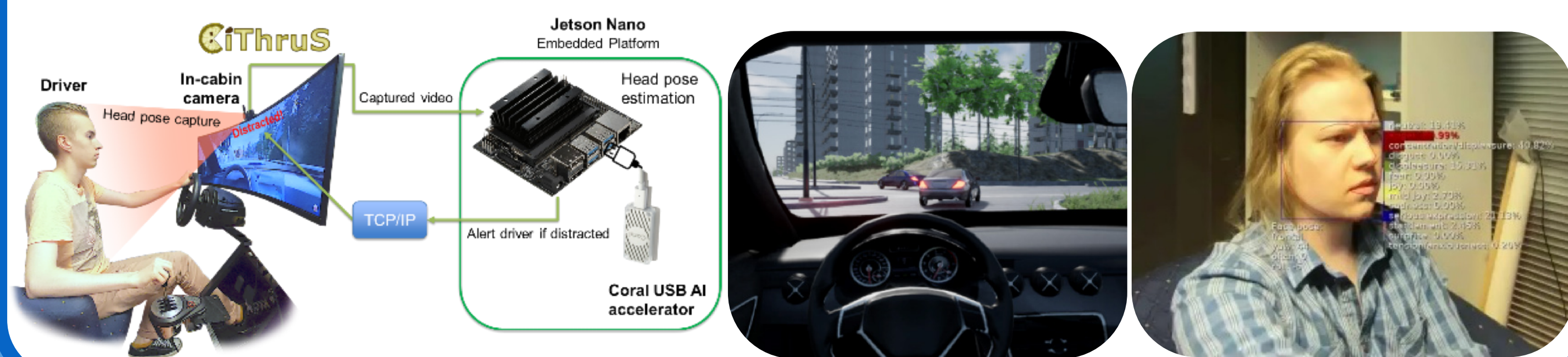
Seamless interworking between the car's onboard computing system and infrastructure-based control system for autonomous driving.



## NewControl SC3: Virtual platforms for holistic decision making and control

### Demonstrator: Vision-based driver/passenger monitoring using neural networks

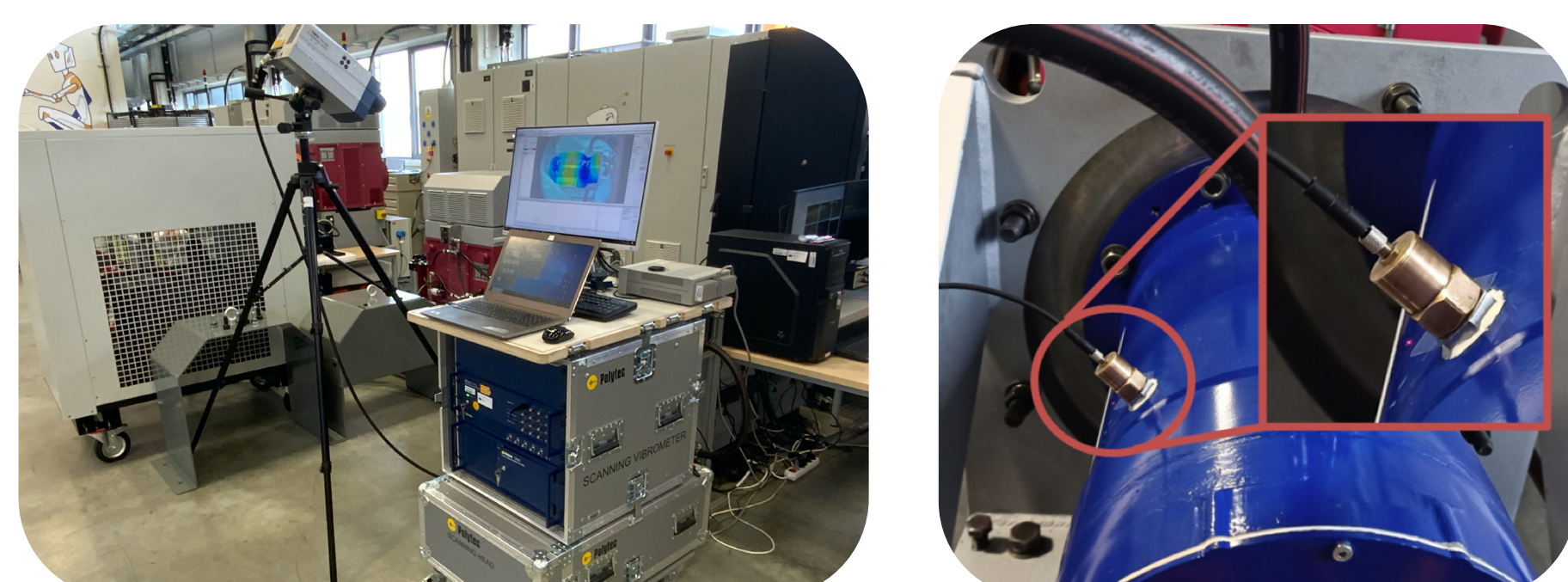
- An example DIL real-time driving and traffic simulation use case about vision-based driver distraction monitoring
- Intelligent facial expression detection system to monitor in-cabin emotional states (13 named states)
- Face position and orientation detection system to monitor position of head and possible angles of vision



## NewControl SC4: Virtual platforms for stable and efficient propulsion

### Demonstrator: Electric drive platform

- Reduce NVH by solving a trade-off between efficiency and noise/vibrations
- Increase the efficiency and lifetime of powertrain components by predictive and reactive adaptive control strategies
- Develop the Smart Diagnostic Sensor (SDS) with data fusion from different vibration sensors and data analysis on the edge and test it on a testbench



EDGE A-IQ READY

A-IQ Ready project aims to introduce and materialise an intelligent autonomous ECS fit for our digital age and utilise crucial technologies, like edge continuum orchestration for artificial intelligence, distributed collaborative intelligence and quantum sensing, which could prove revolutionary for most services and industries. These technologies and their combination will propel the transition to a Europe of Society 5.0.

## A-IQ Ready SC1: Safe co-existence of automated and manual transport at industrial sites

### Demonstrator: Autonomous container handling and log transportation

The aim is to enable coexistence between automated and manually driven vehicles as well as field workers at industrial outdoor sites. This requires improved infrastructure (with novel sensors), improved algorithms, higher safety.



### A-IQ Ready SC2: Search & rescue and emergency response for civil safety

The aim is the localization of persons (survivors) in GNSS denied environments by utilizing quantum sensor technology.

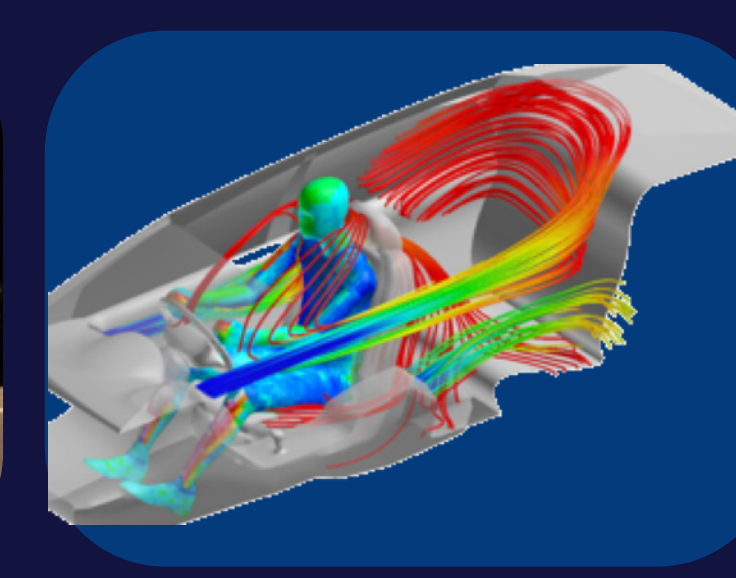


## A-IQ Ready SC3: Digital health and emergency recognition for driver and operator

Demonstrators will focus on the estimation of the operator's state at the edge and detect drowsiness and estimate attention level using contact/contactless sensors and vision systems that monitor the operator and the environment.

### Expected results:

- Precise assessment of the subject's health and environmental status
- Improved input based on sensors and cameras
- Seamless combination of behavioural and biometrical parameters, acquired from vision systems and contact/contactless sensors (e.g., wearable/RADAR)



## A-IQ Ready SC4: Propulsion health and availability in safety critical systems

### Demonstrator: Several use cases demonstrating availability and safety of powertrains

Precise and extensive e-Machine measurements through application of novel sensors (e.g., quantum sensor) for better control, maintenance and higher safety.

Currently, To bulky

Aim, Compact

Application

