Kokemuksia ja huomioita EU-projekteihin osallistumisesta

Lauri Lehti 19.1.2024

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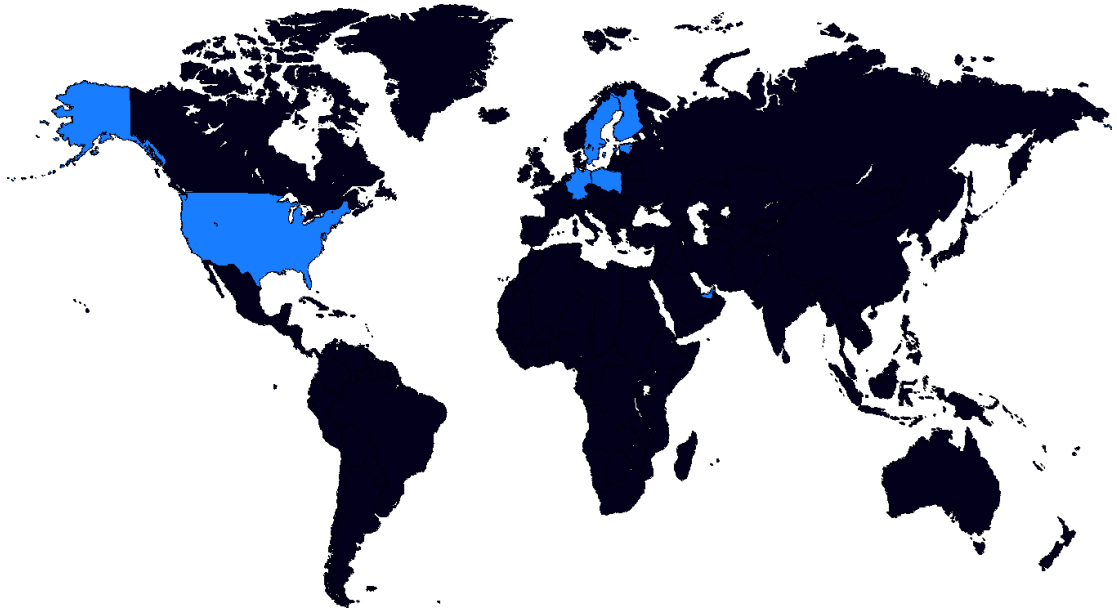
UNIKIE IN BRIEF

WE DRIVE THE CHANGE



Unikie is a software engineering and innovation company that **infuses intelligence into** machines, vehicles, and industrial solutions. We enable our clients to become leaders within their industries, securing their success in the evolving digital landscape of tomorrow.

We are building a **more secure, efficient, and intelligent world** by providing automated marshalling solutions and software engineering services, driven by a genuine love and passion for everything we do.

64 M€ Revenue (2023)	**2015** Year Founded	**7** Countries
600+ Team Headcount	**20%** FTE Headcount Growth YoY	**180+** Clients Globally
Sensors / Edge 100+	**Embedded Apps** 250+	**HMI** 50+
Data Platforms 20	**Enterprise Apps Dev** 150+	**UX / UI** 20

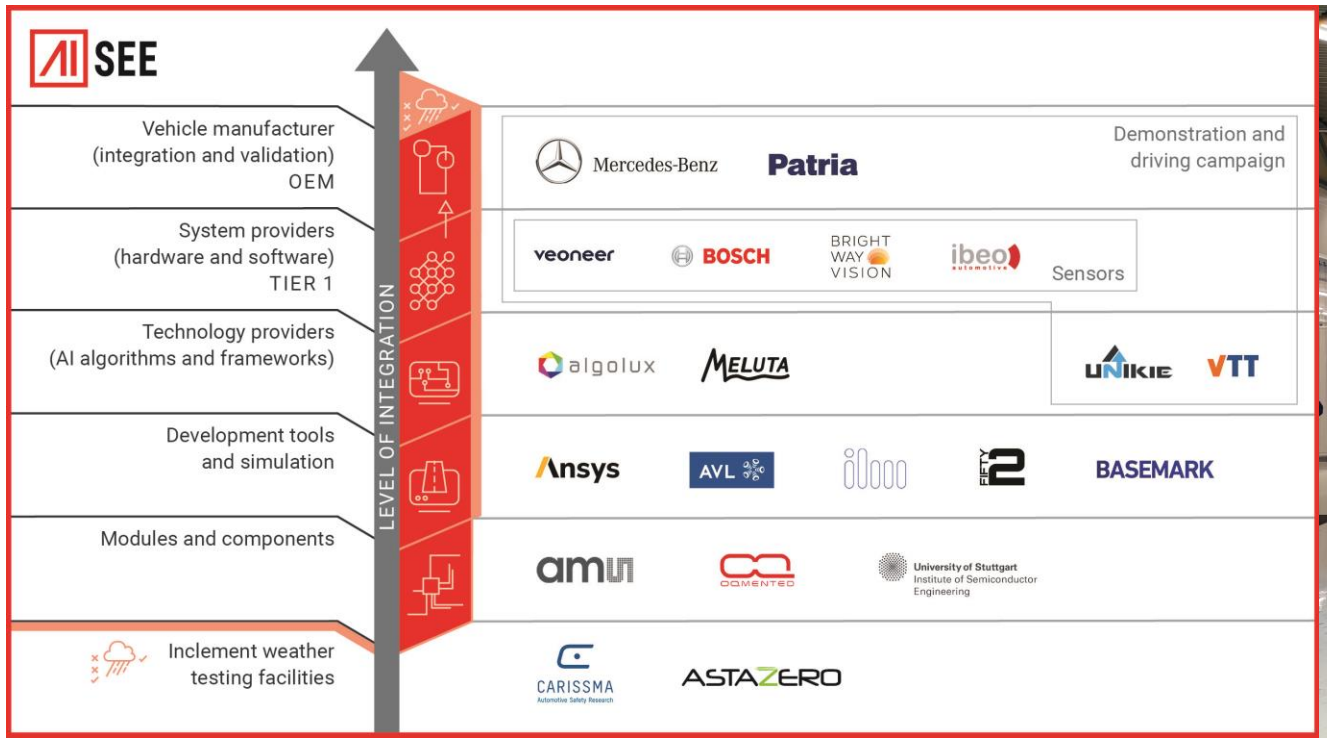
Current projects

Project	Duration	Instrument	Scope
AI-SEE	01.04.2021 - 31.12.2024	Penta (Eureka)	Autonomous driving in adherse weather
Energy ECS	01.06.2021 - 31.11.2024	Chips JU (Horizon)	Smart and secure energy solutions for future mobility
GenerIoT	1.1.2023 - 31.12.2025	ITEA (Eureka)	Model based IoT DevOps.
AGRARSENSE	1.1.2023 - 31.12.2025	Chips JU (Horizon)	Cutting edge technology solutions for sustainable agriculture and forestry
A–IQ Ready	1.1.2023 - 31.12.2025	Chips JU (Horizon)	Quantum Sensor, Neuromorphic Acceleration, AI in Multi-Agent Systems to build the edge continuum as the digital backbone for the Society 5.0

*ECSEL JU=>KDT JU=> CHIPS JU
** Unikies is member of AENEAS

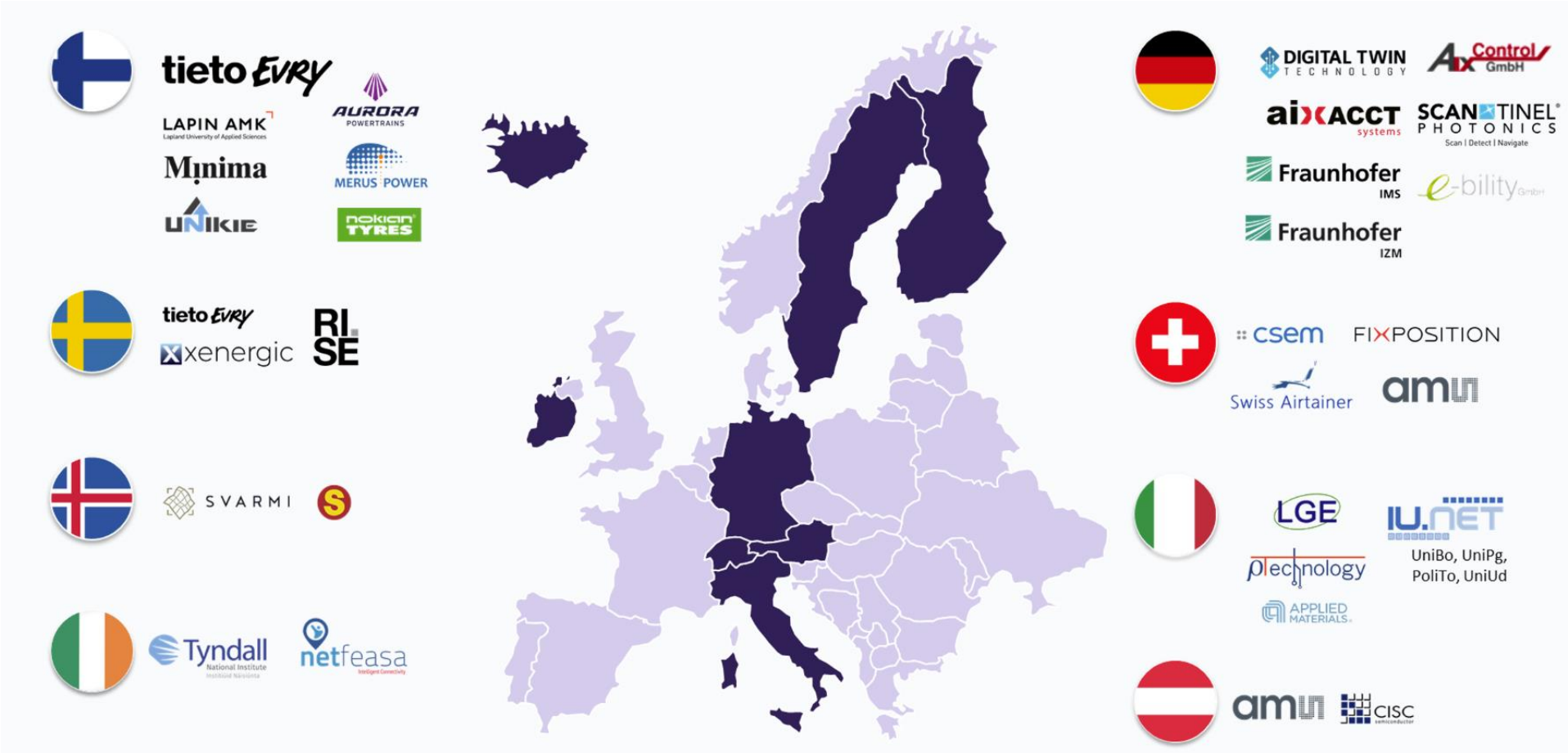
AI-SEE

- Project's overall goal is to develop a novel, all-weather multi-sensor perception system supported by Artificial inteligence (AI) that enables automated travel in all visibility and weather conditions and takes the technology to SAE L4 – the first highly automated driving level.
- MIMO Radar, Digital SWIR LiDAR, Gated LiCAM, Gated SWIR Camera, High Definition Maps, Artificial Intelligence, Multisensory data fusion, Generative Adversarial Networks, Deep Sparse Multi-Scale Convolutional Neural Networks, Inclement Weather Simulation



Energy ECS

- Energy ECS (Electronics, Components, Systems) project is a large 3-year consortium project on smart and secure energy solutions for future mobility. The project aims to develop a set of technologies to improve the digitalization of e-mobility systems and related energy solutions.

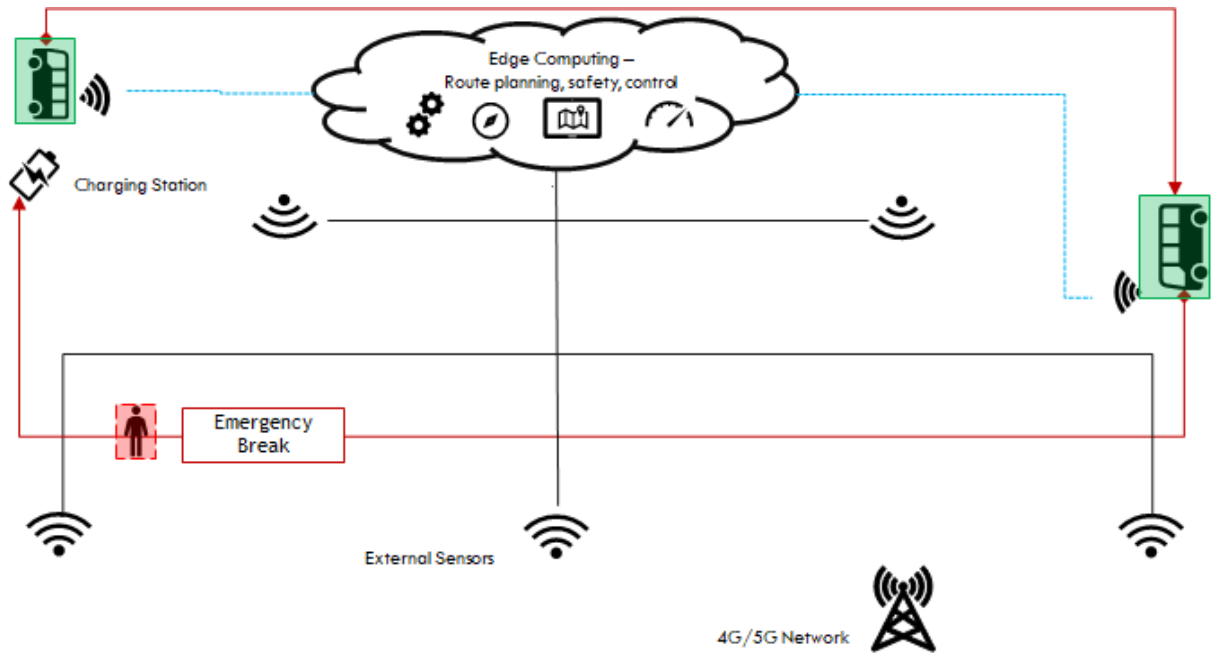


Energy ECS

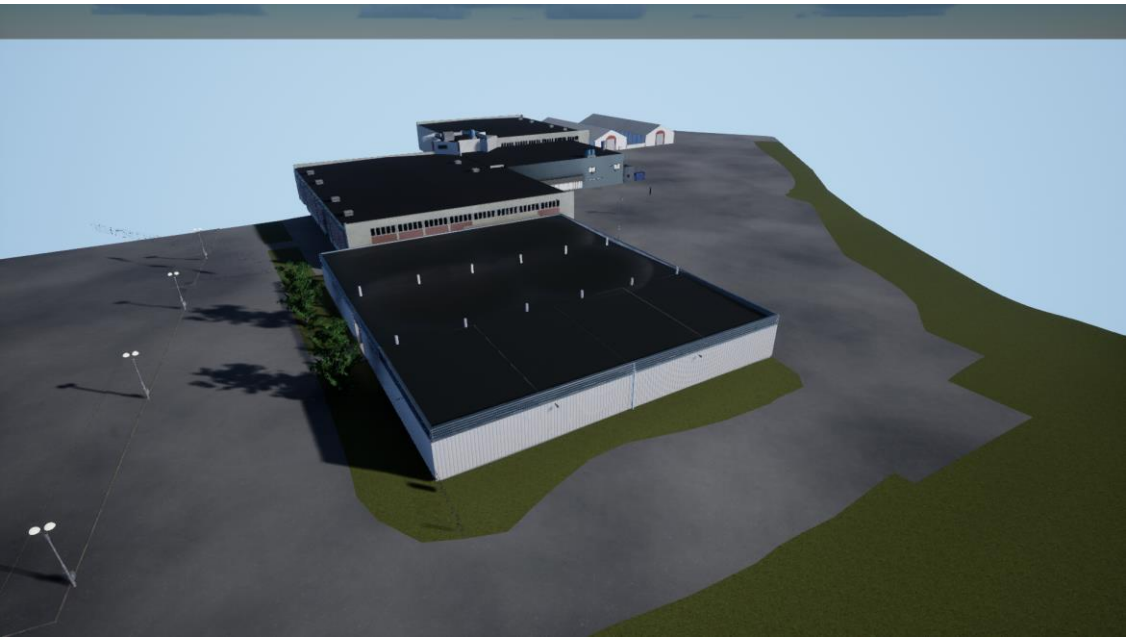
UC6 targets to automate operations of electric buses, ensuring an efficient and safety during charging process in closed area during night.

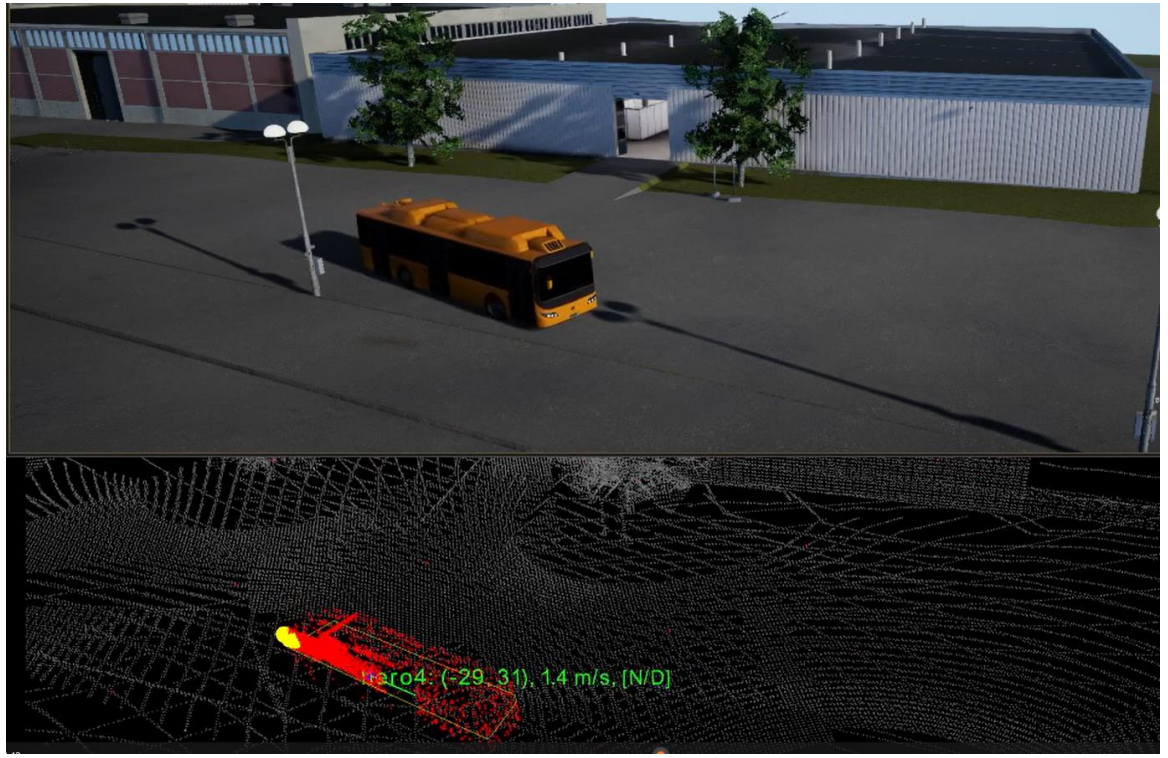
The target is to:

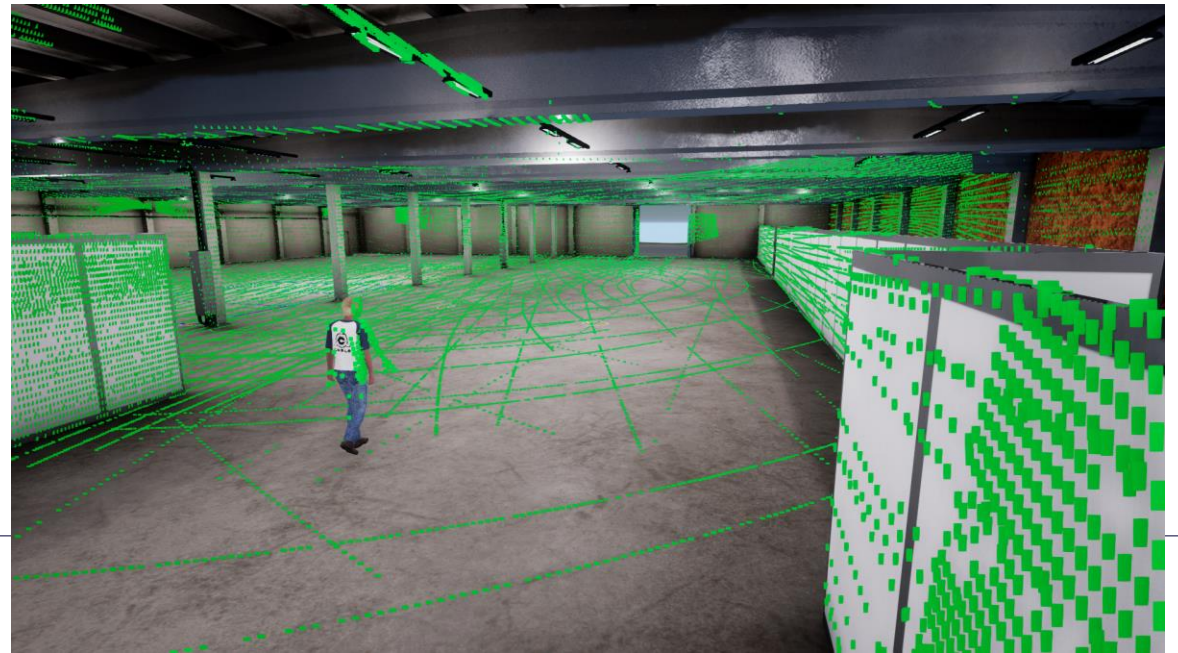
- to render existing electric buses as autonomous in closed areas like bus depots with external, stationary sensors and edge computing-based AI.
- to gain technical proof of concept for the infrastructure-based autonomous depot setup and seamless real-time co-operation between sensors, autonomous driving algorithms and eventually with the bus



Energy ECS

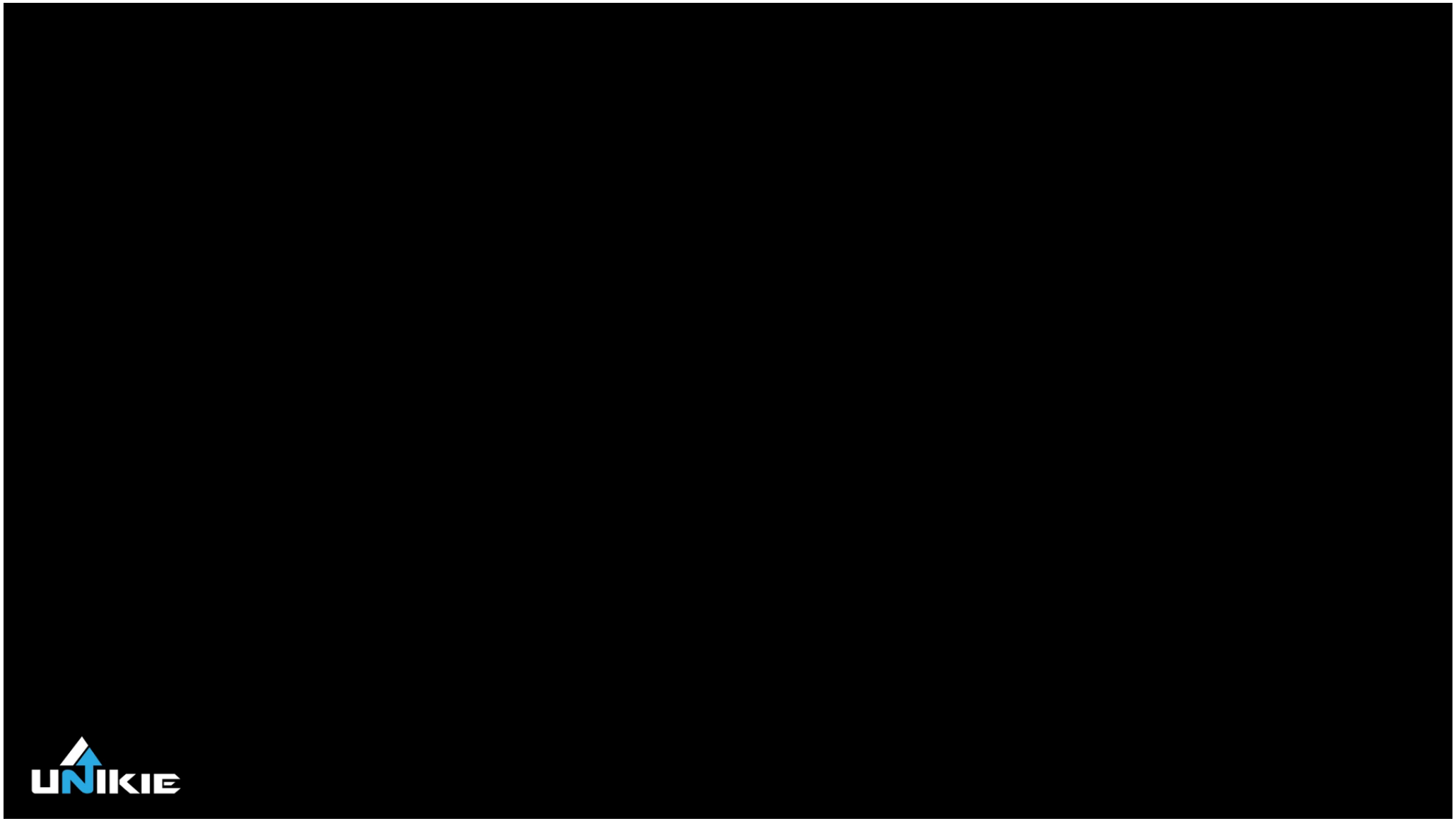




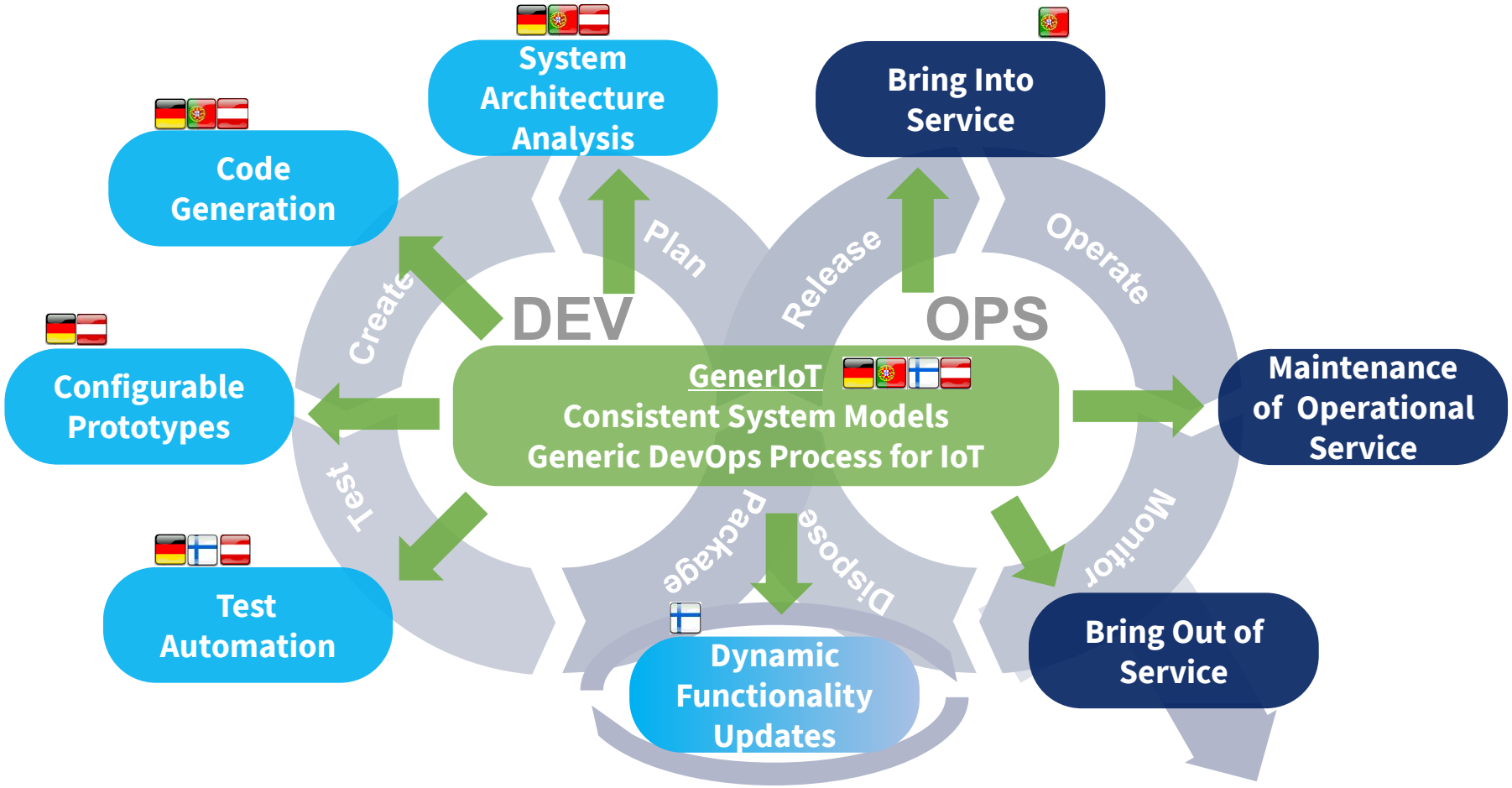


Energy ECS

Energy ECS

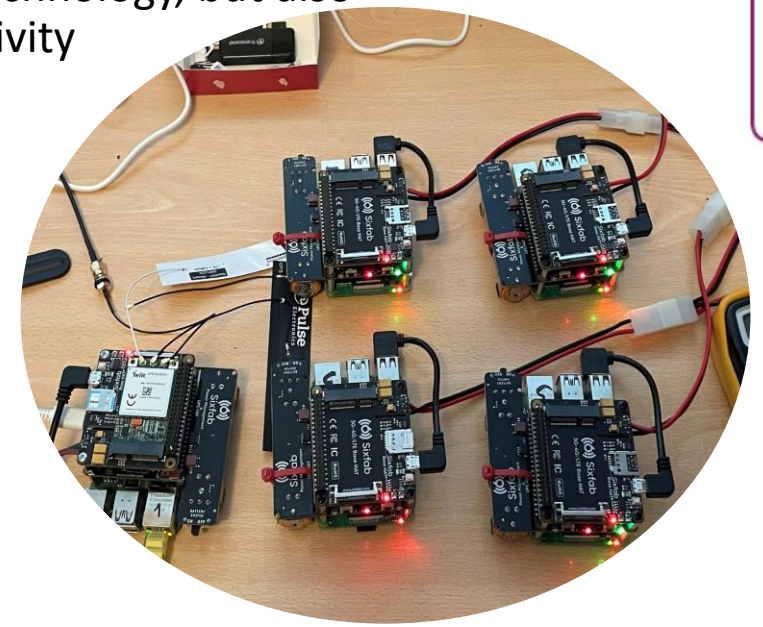


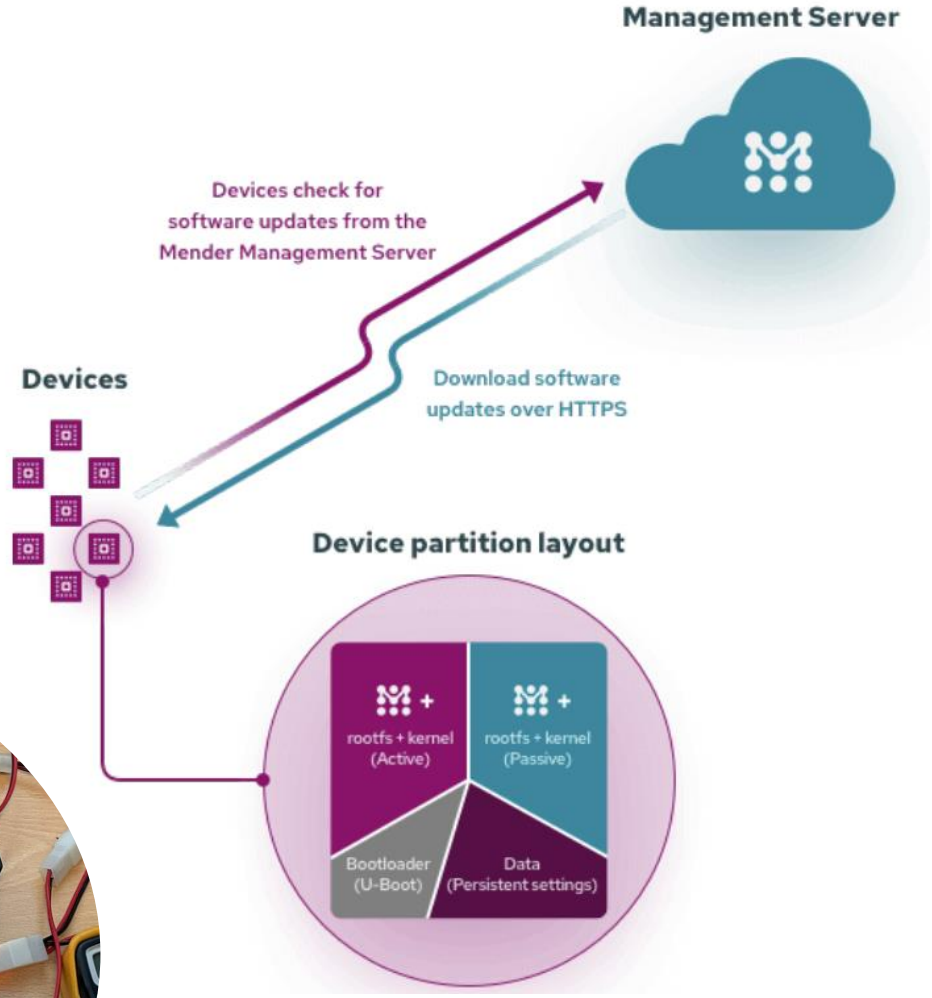
GenerIoT: Generating and Deploying Lightweight, Secure and Zero-overhead Software for Multipurpose IoT Device



GenerIoT

- Main contribution is to research and develop proof of concept for security solution(s) which concentrates on cyber security and updatability on IoT-devices and related system level components
- In this project Unikie has role of technology provider and will mainly focus on security aspects. Unikie will develop its security solutions which shall be used part of the Finnish demonstrator. Especially focus shall be on the remote updatability of the IoT devices. Unikie will not only provide technology, but also provides expertise for security connectivity





AGRARSENSE

The project aims to develop sensor and decision-support technologies and enablers for smart farming and forestry with a holistic approach that is concretely demonstrated in seven use cases.

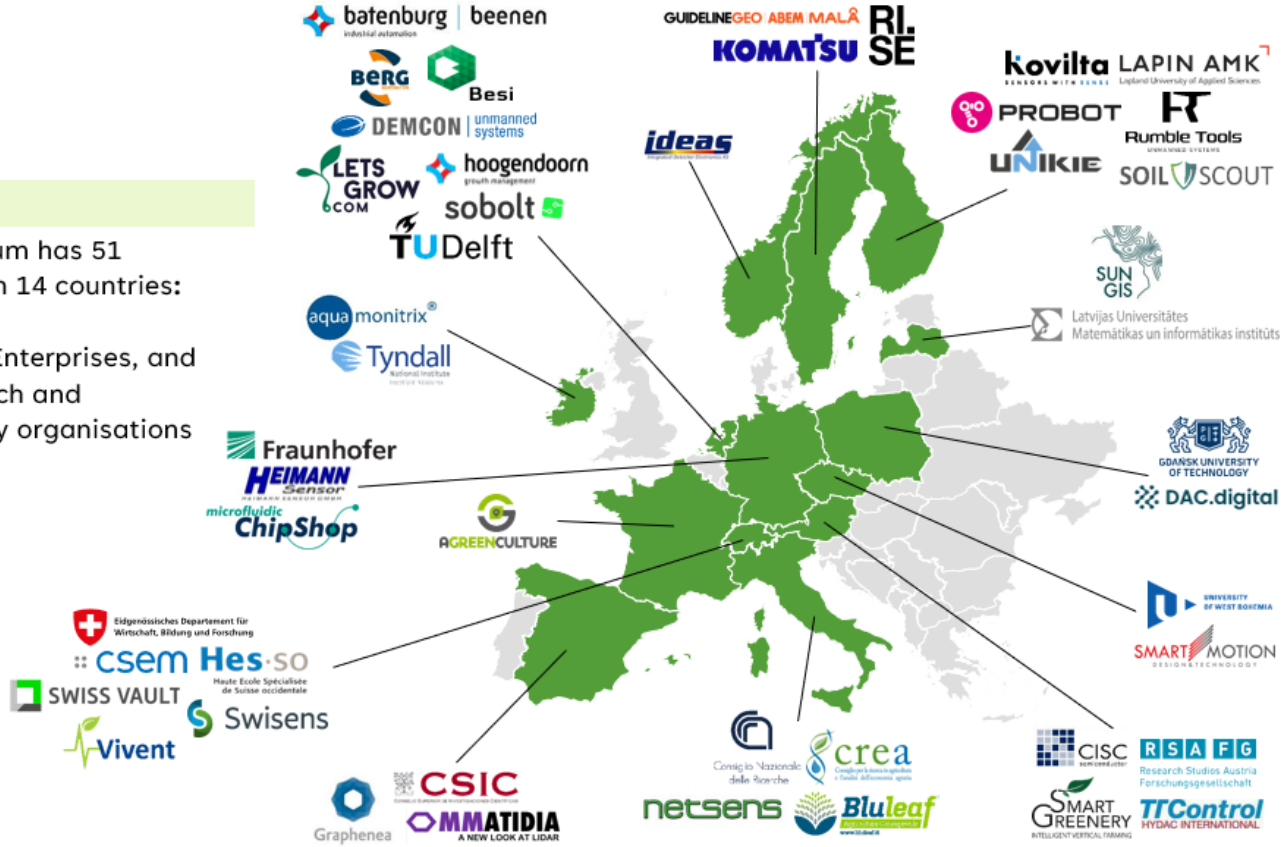
The developed technologies include:

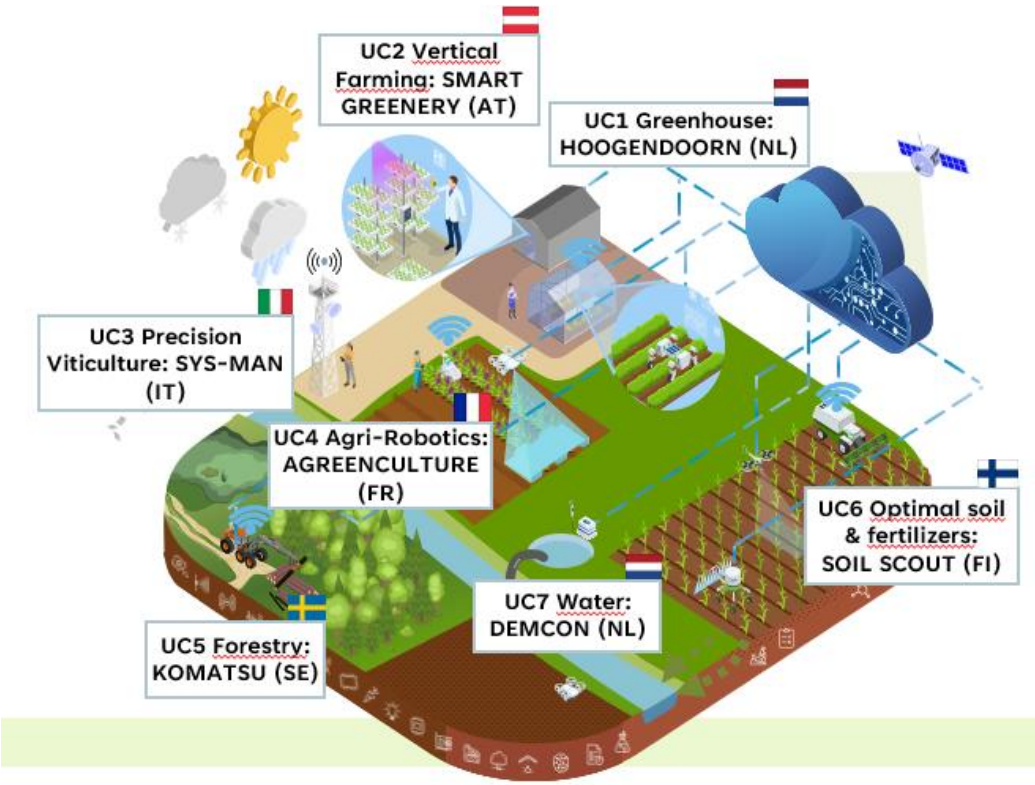
- Sensing and other hardware components
- Software and IoT components
- System level solutions

PARTNERS

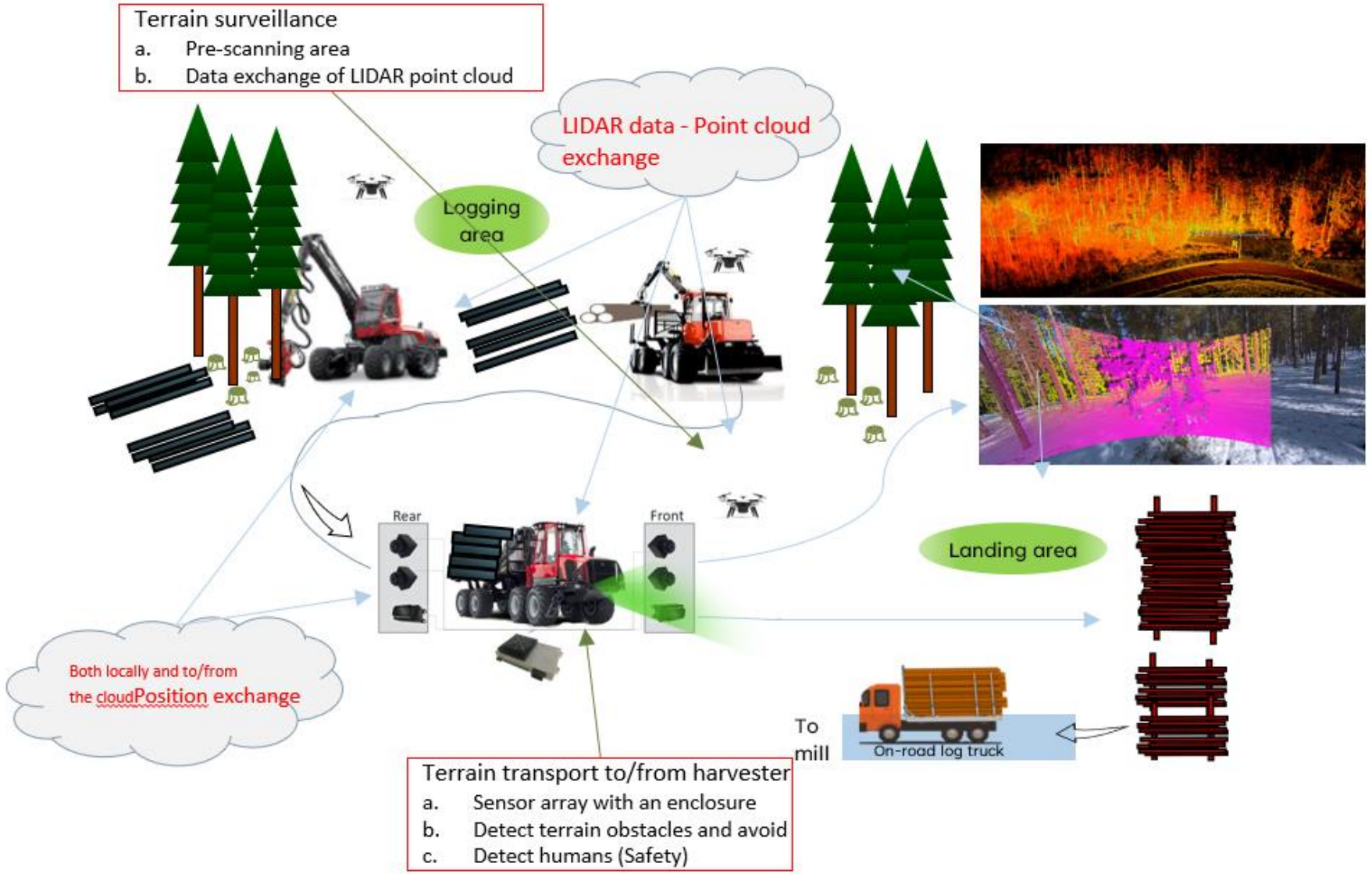
The consortium has 51 partners from 14 countries:

- 22 SMEs,
- 14 Large Enterprises, and
- 15 Research and technology organisations

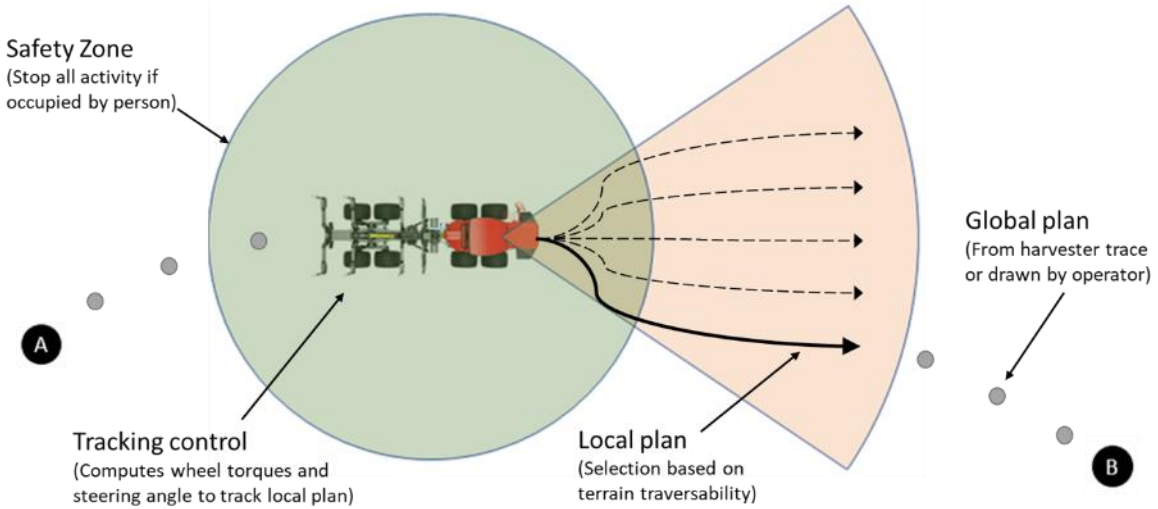


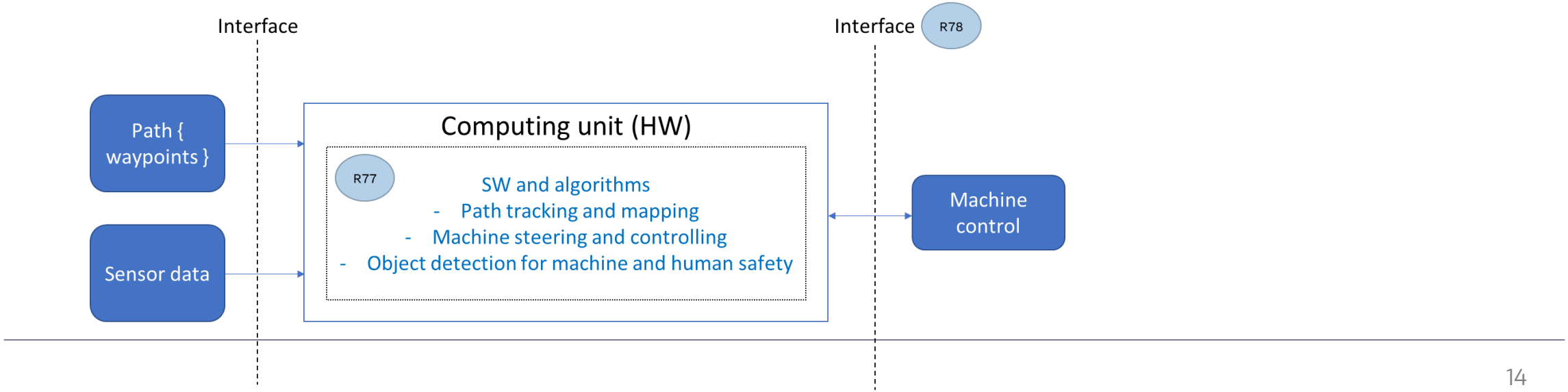


AGRARSENSE


Terrain surveillance
a. Pre-scanning area
b. Data exchange of LIDAR point cloud
LIDAR data - Point cloud exchange
Logging area
Rear
Front
Landing area
Both locally and to/from the cloudPosition exchange
To mill
On-road log truck
Terrain transport to/from harvester
a. Sensor array with an enclosure
b. Detect terrain obstacles and avoid
c. Detect humans (Safety)

Autonomous driving of shuttle (forwarder) in offroad terrain



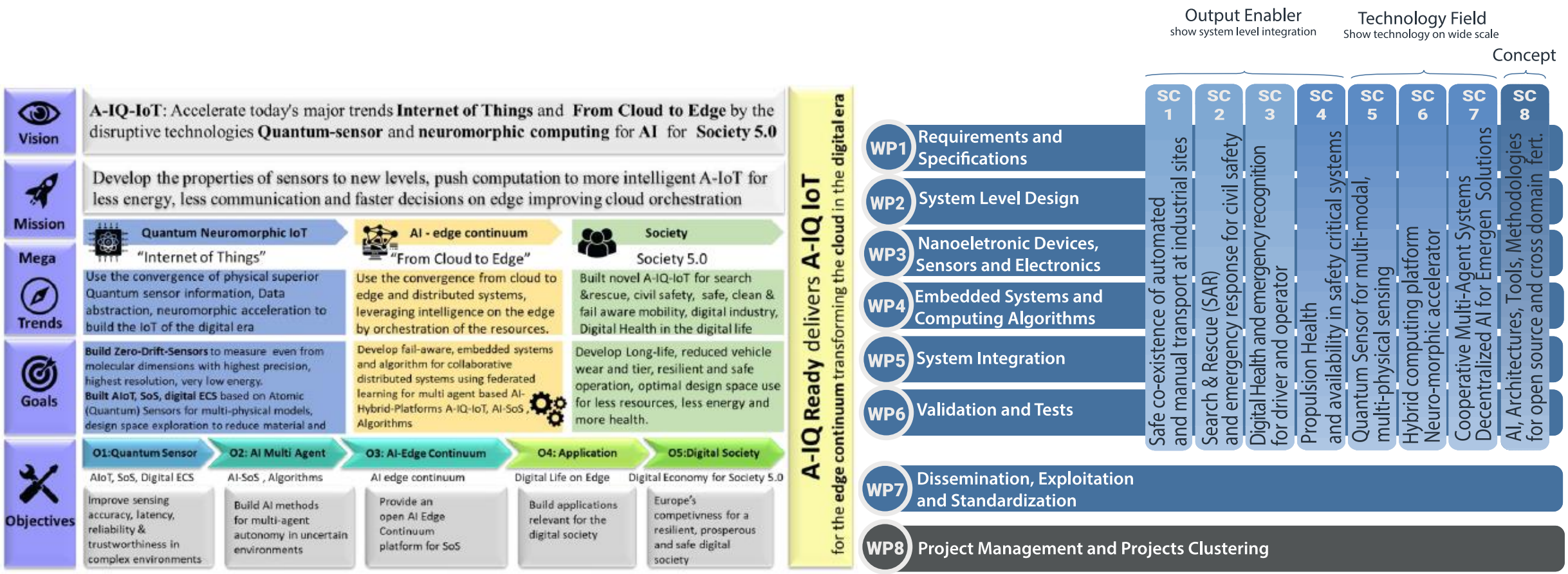


A-IQ Ready

49 Partners 15 European countries	Total budget € 33,7 M	Project duration 36 months	Coordinator AVL List GmbH

- Artificial Intelligence Using Quantum Measured Information for Realtime Distributed Systems at the Edge
- The 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:


Vision
A-IQ-IoT: Accelerate today's major trends Internet of Things and From Cloud to Edge by the disruptive technologies Quantum-sensor and neuromorphic computing for AI for Society 5.0
Mission
Develop the properties of sensors to new levels, push computation to more intelligent A-IoT for less energy, less communication and faster decisions on edge improving cloud orchestration
Mega Trends
Quantum Neuromorphic IoT
"Internet of Things"
Use the convergence of physical superior Quantum sensor information, Data abstraction, neuromorphic acceleration to build the IoT of the digital era
AI - edge continuum
"From Cloud to Edge"
Use the convergence from cloud to edge and distributed systems, leveraging intelligence on the edge by orchestration of the resources.
Society
Society 5.0
Built novel A-IQ-IoT for search &rescue, civil safety, safe, clean & fail aware mobility, digital industry, Digital Health in the digital life
Goals
Build Zero-Drift-Sensors to measure even from molecular dimensions with highest precision, highest resolution, very low energy.
Built AIoT, SoS, digital ECS based on Atomic (Quantum) Sensors for multi-physical models, design space exploration to reduce material and
Develop fail-aware, embedded systems and algorithm for collaborative distributed systems using federated learning for multi agent based AI-Hybrid-Platforms A-IQ-IoT, AI-SoS , Algorithms
Develop Long-life, reduced vehicle wear and tier, resilient and safe operation, optimal design space use for less resources, less energy and more health.
Objectives
O1:Quantum Sensor
AIoT, SoS, Digital ECS
Improve sensing accuracy, latency, reliability & trustworthiness in complex environments
O2: AI Multi Agent
AI-SoS , Algorithms
Build AI methods for multi-agent autonomy in uncertain environments
O3: AI-Edge Continuum
AI edge continuum
Provide an open AI Edge Continuum platform for SoS
O4: Application
Digital Life on Edge
Build applications relevant for the digital society
O5:Digital Society
Digital Economy for Society 5.0
Europe's competivness for a resilient, prosperous and safe digital society
A-IQ Ready delivers A-IQ IoT for the edge continuum transforming the cloud in the digital era

Output Enabler
show system level integration
Technology Field
Show technology on wide scale
Concept
SC 1
SC 2
SC 3
SC 4
SC 5
SC 6
SC 7
SC 8
WP1 Requirements and Specifications
WP2 System Level Design
WP3 Nanoeletronic Devices, Sensors and Electronics
WP4 Embedded Systems and Computing Algorithms
WP5 System Integration
WP6 Validation and Tests
Safe co-existence of automated and manual transport at industrial sites
Search & Rescue (SAR) and emergency response for civil safety
Digital Health and emergency recognition for driver and operator
Propulsion Health and availability in safety critical systems
Quantum Sensor for multi-modal, multi-physical sensing
Hybrid computing platform Neuro-morphic accelerator
Cooperative Multi-Agent Systems Decentralized AI for Emergen Solutions
AI, Architectures, Tools, Methodologies for open source and cross domain fert.
WP7 Dissemination, Exploitation and Standardization
WP8 Project Management and Projects Clustering

A- IQ Ready

Supply Chains

SC1

Safe Co-existence of Automated and Manual Transport at Industrial Sites

SC2

Search & Rescue (SAR) and emergency response for civil safety

SC3

Digital Health and Emergency recognition for Driver and Operator

SC4

Propulsion health and availability in safety critical situations

SC5

Quantum sensor Multi-modal, multi-physical sensing at highest precision

SC6

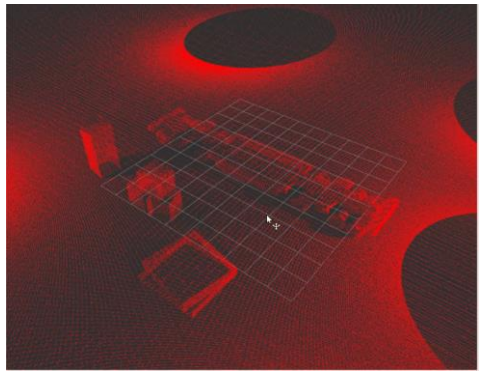
Hybrid Computing (Quantum Computing & High-Performance Computing)

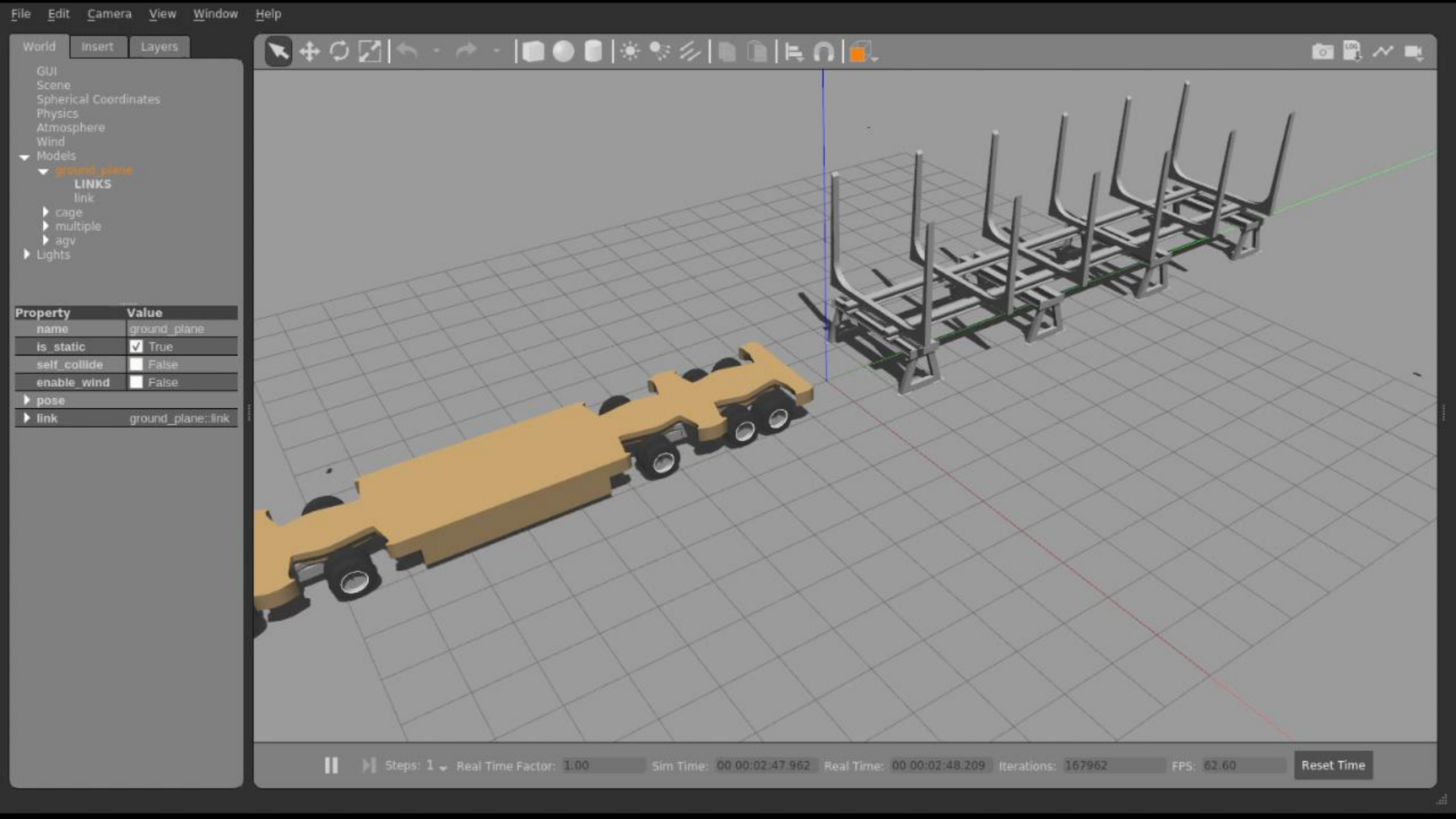
SC7

Cooperative Multi-Agent Systems (Decentralized AI for Emergent Industrial Solutions)

SC8

AI, Architectures, Tools and Methodologies (for open source and cross domain fertilization)




File
Edit
Camera
View
Window
Help
World
Insert
Layers
GUI
Scene
Spherical Coordinates
Physics
Atmosphere
Wind
Models
ground_plane
LINKS
link
cage
multiple
agv
Lights
Property
Value
name
ground_plane
is_static
True
self_collide
False
enable_wind
False
pose
link
ground_plane::link
Steps: 1
Real Time Factor: 1.00
Sim Time: 00 00:02:47.962
Real Time: 00 00:02:48.209
Iterations: 167962
FPS: 62.60
Reset Time

Some general remarks

Project proposal preparation

- The most important and one of the laborious part of the project => But don't take short cuts here
- The earlier you jump on board the more you can influence
- Requires ability to look at least three years in the future or make good guesses
- Written commitment of you work
- However, amendments are possible with some extend
- Budget and person months
  - EU focus on person monhts vs BF focus more on the costs
  - Don't over estimate you salary costs or you are in drouble with you person months
- Autumn deadllines and holiday season are not good match => Be early with you contributions
- PCA (project consortium agreement)
  - Background is any data, know-how or information, IPR, etc
  - Lawyers' playground

Project proposal preparation

- Roles in the project
  - Project coordinator
  - Work package lead
  - Use case/Supply chain/Demonstrator leader
  - Task lead
  - National coordinator
- The more budget and allocated resource the more responsibilities
- Subcontracting project coordinator services is not a bad idea
- Timeline
  - Preparation can take years in worst case
  - Sometimes some country can get funded when project has run already one year (more EUREKA issue)
  - Extension for the projects are quite typical

Reporting

- First payment received before start or first reporting
- EU reporting tool is awful
- Roles and role assigments in the portal can be very confusing
- Track you hours per WP from day one
- Deviations (e.g. in efforts or in cost categories) are always possilble when you have good reasonings
- Overspend your budget, if something doesn't get approved or something else
- All in all reporting is straightforward process, when you know what you have promised and what you have done for the reporting period
- Take pictures what ever you do, they might be very usefull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