EVENTS @CCAM Multi-Cluster Meeting

Dr. Panagiotis Lytrivis, ICCS
Dr. Bill Roungas, ICCS
10/10/2024, Brussels, Belgium

EVENTS

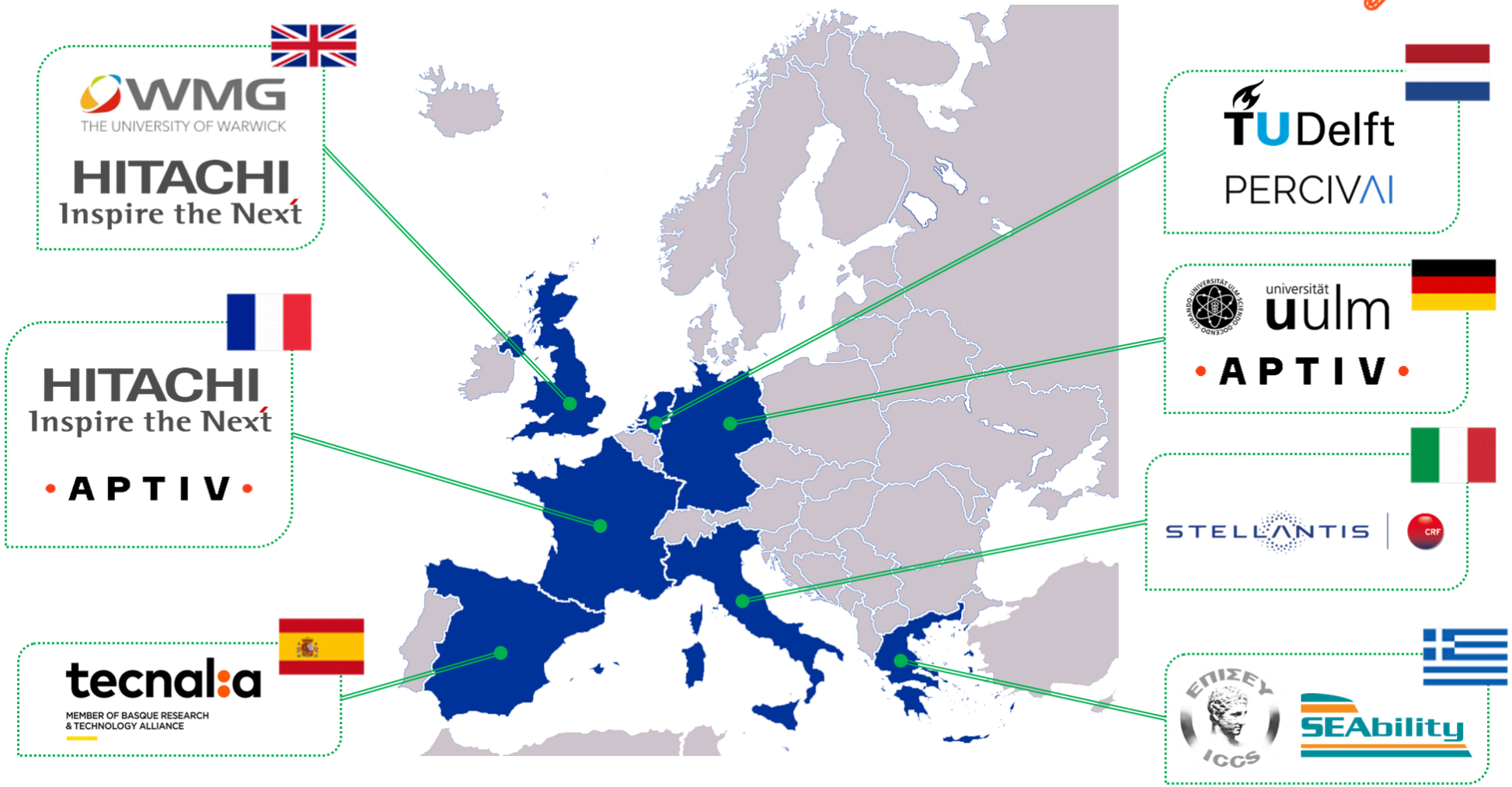
EVENTS Facts

- **Full Title:** ReliablE in-Vehicle pErception and decision making in complex environmenTal conditions
- **Project ID:** 101069614
- **Funded Under:** Horizon Europe
- **Funding Scheme:** IA –Innovation Action
- **Duration:** 36 months, 01 September 2022 – 31 August 2025
- **Total Cost:** EUR 6.920.598
- **EU Contribution:** EUR 5.534.448
- **Project Coordinator:** Institute of Communication and Computer Systems (ICCS)

Funded by the European Union

EVENTS project has received funding under grant agreement No 101069614. It is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the granting authority can be held responsible for them.

EVENTS Consortium



12 partners within 6 EU Member States and UK

Funded by the European Union

EVENTS Results

Self-Assessment of Collective Perception

- Probabilistic fusion for collective perception with plausibility/consistency checks
- Adaptive Kalman Filtering Based on Subjective Logic Self-Assessment
- Hybrid simulation, in which the demo vehicle exchanges information with the simulations

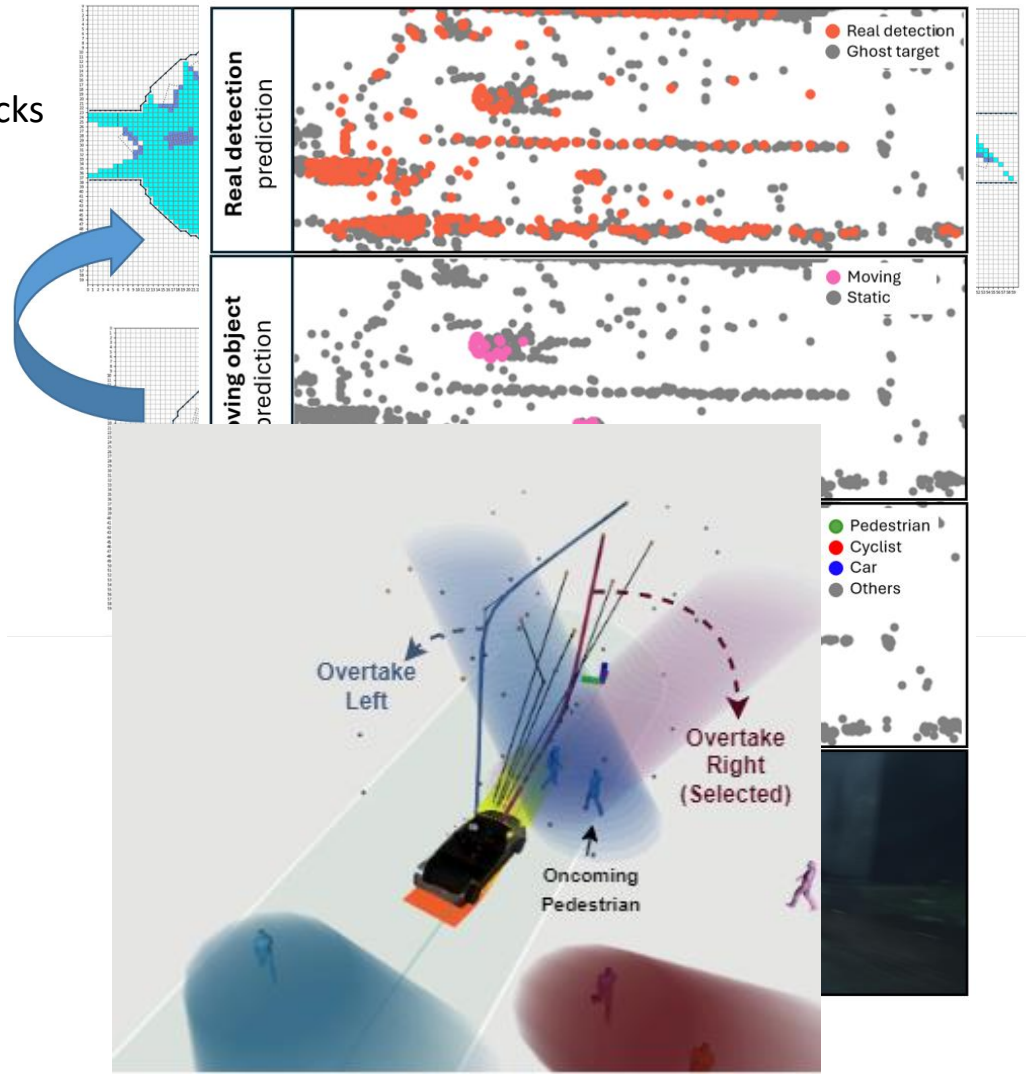
4D Radars for Perception in Adverse Weather

Novel multipurpose network designed to do:

- Noise rejection (real vs ghost radar targets)
- Movement detection (static vs moving radar targets)
- Semantic segmentation (targets from cars vs bikes vs pedestrians vs background)

VRU Prediction & Planning

- Development of accurate deep learning-based prediction methods taking into account class info and map-data
- Investigation of domain transfer capabilities of motion models
- Motion planner with decision making that computes whether to overtake or stop



Funded by the
European Union

EVENTS - Lessons Learned

Overall

- Even slightly adverse conditions (e.g., light rain) can significantly degrade the sensors' performance.
- Significantly more expensive sensors (e.g., Lidars) do not necessarily perform better than more inexpensive but state-of-the-art solutions (e.g., Radars).
- The challenges do not end on the implementation and integration of the algorithms but also extend to the evaluation of each layer (perception & decision-making) as well as the AD system as a whole

Experiment-specific

- The 4D radar AI approach allows seamless switching between sensors from different vendors, offering flexibility and requiring much less training data.
- Many innovative AI methods are too research-focused, not real-time, and work only on specific datasets—real-world implementation is much tougher.
- Automated driving in complex scenarios with many VRUs is achievable, but performance is affected by many components, from perception accuracy to delays in actuator commands. Full-stack integration and testing is a complex and time consuming process that is often underestimated

Funded by the European Union

EVENTS – Hinders & Work to be done

Hinders

- Testing scenarios in adverse weather conditions in the real world, can be very time consuming, especially when you have to wait months to have the appropriate conditions.
- Specialized personnel, even at a junior level, is scarce throughout Europe.

Work to be done

- Integration with control solution to test the end-to-end weather robust safety system live.
- With regards to VRUs, robustness is the key challenge, especially if some VRUs suddenly change their behaviour (e.g. cyclist cut in the automated vehicle).

Funded by the European Union

www.events-project.eu

EVENTSproject22

@EVENTSproject22

EVENTS project

Thank you for your attention!

Dr. Panagiotis Lytrivis, Dr. Bill Roungas
ICCS

Funded by the European Union

This project has received funding under grant agreement No 101069614. It is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the granting authority can be held responsible for them.