



# Reliable in-Vehicle perception and decision-making in complex environmental conditions (EVENTS)

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# EVENTS Challenges & Solutions



## Challenge #1: Improve perception in Adverse Weather

### Solution: 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)

## Challenge #2: Augment perception and decision making with V2X

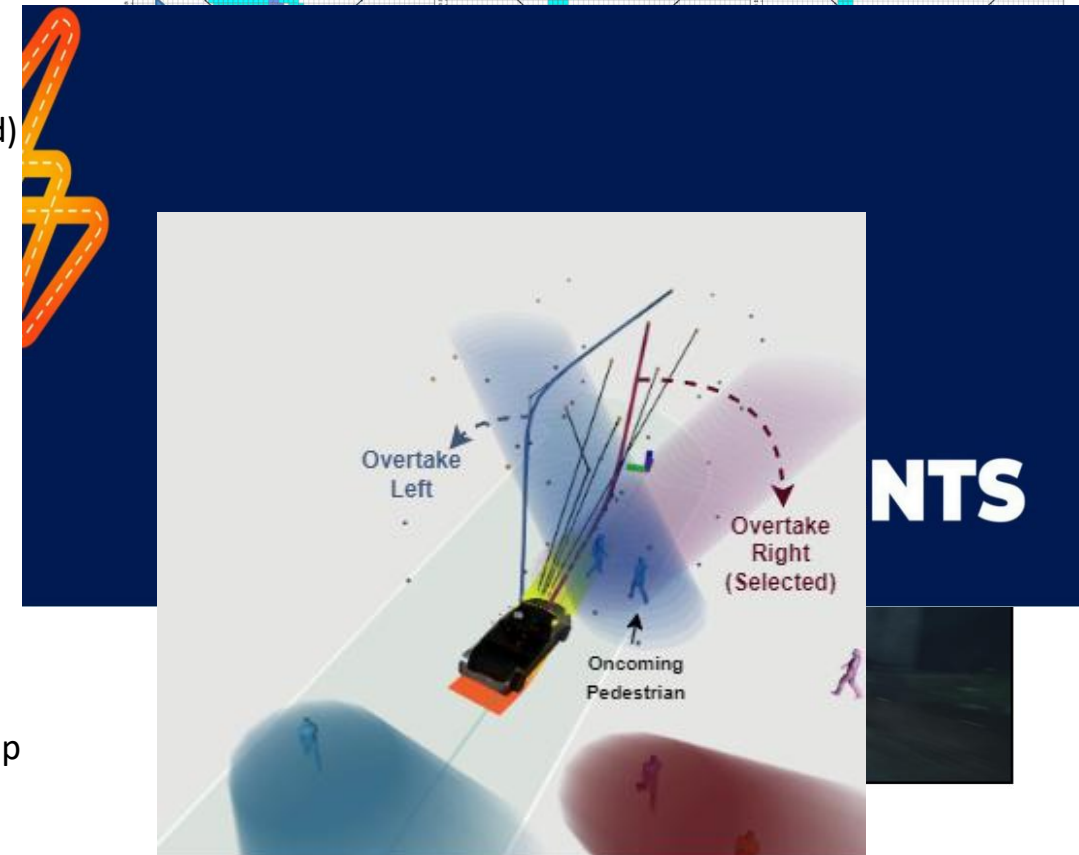
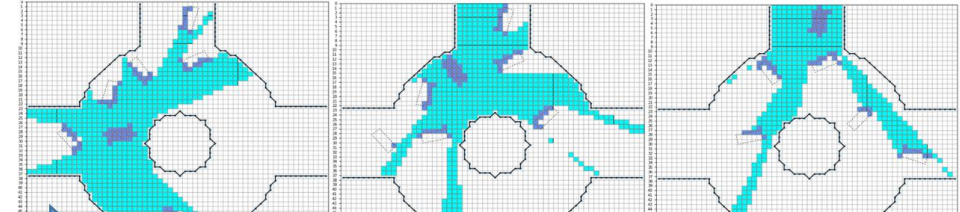
### Solution: Collective Perception & Intention Prediction

- Hybrid simulation, in which the demo vehicle exchanges information with the simulations
- Improved algorithms on prediction of the movement of other vehicles

## Challenge #3: VRU Prediction & Planning

### Solution: 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



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# 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.
- Rigorous evaluation of the implemented algorithms, in order to build trust toward these systems.
- 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).



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Thank you for your attention!



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