

NAPOLIFEDERICOII

## Workshop @ International Conference on Computer Vision (ICCV) 2021

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The accurate detection and anticipation of actions performed by multiple *road agents* (pedestrians, vehicles, cyclists and so on) is a crucial task to address for enabling autonomous vehicles to make autonomous decisions in a safe, reliable way. While the task of teaching an autonomous vehicle how to drive can be tackled in a brute-force fashion through direct reinforcement learning, a sensible and attractive alternative is to first provide the vehicle with situation awareness capabilities, to then feed the resulting semantically meaningful representations of road scenarios (in terms of agents, events and scene configuration) to a suitable decision-making strategy. In perspective, this has also the advantage of allowing the modelling of the reasoning process of road agents in a theory-of-mind approach, inspired by the behaviour of the human mind in similar contexts.

Accordingly, the goal of this workshop is to put to the forefront of the research in autonomous driving the topic of *situation awareness*, intended as the ability to create semantically useful representations of dynamic road scenes, in terms of the notion of a *road event*. A road event can be defined as a triplet composed by a moving agent, the action(s) it performs and the corresponding scene locations. This concept is at the core of our new ROad event Awareness Dataset (ROAD) for Autonomous Driving, the first dataset designed to test an autonomous vehicle's ability to detect road events (paper: <u>https://arxiv.org/abs/2102.11585</u>; code: <u>https://github.com/gurkirt/road-dataset#</u>), built upon 22 videos of the Oxford RobotCar Dataset and recently released by the organizers.

In addition to a *paper track* inviting papers on semantic perception and simulation awareness for autonomous driving, *five invited talks* by top researchers in the field (Raquel Urtasun, Adrien Gaidon, Daniela Rus, Deva Ramanan, Paul Newman) and a *debate* on the future of situation awareness in self-driving and its ethical implications, the workshop will launch *three new challenges*, asking participants to devise approaches for detecting road agents (challenge #1), actions (#2) and events (#3) within ROAD videos. We will also provide as a baseline for ROAD's detection tasks a 3D-RetinaNet model developed by the organizers <<u>https://github.com/gurkirt/3D-RetinaNet</u>>.

The workshop will issue a best paper award, a best student paper award and a prize for the winner of each of the three challenges, and will support diversity at all levels: organization, program committee and audience.

For more information, please visit the workshop website: <<u>https://sites.google.com/view/roadchallangeiccv2021/</u>>.