Call for Papers

2nd International Workshop on

Safe Control of Autonomous Vehicles SCAV 2018

at CPS Week 2018, April 10-13, Porto, PT

Workshop website: https://scav.in.tum.de

Theme, Challenges, and Goals

Autonomous vehicles (AV) **of any kind** (e.g. road, maritime, aerial, unmanned) and **in any configuration** (e.g. individual, connected, cooperative, traffic) will provide novel services having to fulfill strong **safety** requirements. For **controllers of AVs** and for **control schemes of AV collectives**, (1) we must **guarantee safety and resilience** in spite of, e.g.

- maximal permissiveness (e.g. performance requirements),
- indeterminacy (e.g. machine learning discontinuities),
- discrete disturbances (e.g. faults, security breaches, or unexpected road infrastructure updates),
- undesired absence or presence of humans in the loop (e.g. unintentional and malicious misuse),
- classical uncertainties (i.e., noise and disturbance),

(2) we must deliver **verified system designs** for (1), including

- powerful, correct, and reliable safety mechanisms,
- comprehensive and efficient run-time verification,
- correct and reliable run-time self-adaptation,

(3) we must enhance **approaches** for (1) & (2) **to verify**, e.g.

- safe stable and permissive control of AV collectives,
- integration of moving with fixed infrastructure sensors,
- sensing of emergent traffic phenomena.

These objectives will play a decisive role in the adoption of AVs as a consumer, transport, and mobility technology. These objectives demand novel approaches to the **analysis and assurance of local, distributed, and supervisory controllers**.

*The **goal** of this workshop is to discuss and consolidate models, algorithms, and verification approaches for safety and resilience of the whole control loop of autonomous machines and machine collectives.*

The **task** of this workshop is to identify open research problems, discuss recent achievements, bring together researchers in, e.g. control theory, adaptive systems, machine self-organization and autonomy, mobile intelligent robotics, transportation, traffic control, machine learning, software verification, and dependability and security engineering.

Topics of Interest

For this workshop, we kindly request contributions on (i) technical research or methodology (max. 8 pages), (ii) case studies (max. 8 pages), and (iii) problem statements or tools (max. 2 pages) in (but not limited to) the following topics:

- **Formal verification** and **validation** (e.g. testing, simulation, experimentation) of
  - safe high-performance requirements,
  - safe non-deterministic behaviors (weakest invariants),
  - safe off-line and on-line machine-learnable behaviors,
  - resilience against hazardous unintentional or malicious misuse (e.g. non-vigilance, security attacks),
- **Formal models and design methods** for
  - controllers,
  - monitors,
  - platforms (i.e., architecture, SW, HW, network),
- **Verified efficient algorithms** for
  - incremental and online synthesis of controllers,
  - optimal adaptive control,
  - self-adaptation and run-time reconfiguration

for AVs and AV collectives in open environments.

For this interactive, single-day workshop we plan a keynote, an optional poster session in the breaks, and a final discussion.

Submission Guidelines

Prospective participants are invited to submit (i) a technical research paper (max. 8 pages), (ii) a case study from practice (max. 8 pages), or (iii) a short paper (max. 2 pages) combined with a poster, using the *ACM proceedings standard template*, references included. All submissions are expected to be original work not published, or in submission, elsewhere, and will be peer-reviewed by at least three members of the program committee for quality, relevance, and novelty. Accepted papers will be included in the electronic CPSWeek workshop proceedings. **Please, check website for updates!**

Important Dates (AoE)

Full paper deadline	26 January 2018
Author notification	28 February 2018
Camera-ready due	20 March 2018

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