Competition for Motion Planning of Autonomous Vehicles (ITSC 2021)

In recent years, different approaches for motion planning of autonomous vehicles have been proposed that can handle complex situations. This competition provides the opportunity for researchers to compare their approaches with others based on a large database of traffic scenarios.

Competition

In this competition, participants are provided with an extensive database of traffic scenarios with planning problems for each of which a feasible trajectory needs to be planned. Apart from the number of solved scenarios, submissions are assessed with regard to efficiency, safety, and compliance with traffic rules.

The competition is divided into two categories:

- **Interactive** scenarios using the SUMO traffic simulator.
- **Non-interactive** scenarios with provided predictions for other traffic participants.

The traffic scenarios are provided in the CommonRoad format and solution trajectories are uploaded to commonroad.in.tum.de. Our scenario database contains highways, urban environments, and features several types of traffic participants. Tools for parsing scenarios and useful software for motion planning are openly available within the CommonRoad framework.

Participation and Final Workshop

After the public release of the benchmark problems, solutions can be submitted online before the submission deadline. The best participants will have the opportunity to present their approaches at the final workshop as part of the *IEEE International Conference on Intelligent Transportation Systems (ITSC) 2021*. Only registered teams will be able to participate in the final workshop.

Jury

The task of the jury is to come up with a consensus for working groups, define the problem instances, and ensure a fair competition. Anybody participating in the competition can become a jury member. We accept applications from academia and industry; a short email before March 31 to commonroad@lists.lrz.de suffices.

Each working group has a leader who is responsible for organizational aspects (presiding discussions, ensuring the workflow, etc.). The definition of the problem instances and the evaluation criteria are carried out by the working group.

Deadlines

Submissions consist of XML solution files submitted through commonroad.in.tum.de, where also details on the provided software, the evaluation, and submission guidelines can be found.

- Deadline for becoming a jury member: **March 31, 2021**
- Benchmark problem release by the jury: **July 01, 2021**
- Final submission deadline: **September 01, 2021**
- Workshop (virtual): **September 19, 2021** (part of the ITSC 2021 program)

See Rules and Details for more information.

Prize

The jury will select the winner of the competition who will receive a prize of 3000 $ provided by our sponsor **IVEX**. To be eligible for the prize, the participant needs to be registered for the workshop and the motion planner needs to be published as open-source. However, a registration for the workshop is not mandatory in order to participate in the competition, and the registration for the workshop is still possible after the submission deadline.

Workshop Program

The final Workshop will take place on Sunday, September 19th, 2021 at 10:00 (EDT) / 14:00 (GMT). The link for the Zoom session has already been sent out by the ITSC organizers to registered participants.

Times in EDT:

- 10:00 - 10:15: Introduction and Competition Results
- 10:15 - 10:35: Cui Mingyang (Tsinghua University)

  Interactive Planning in CommonRoad - An MCTS & Lattice Planner Method

- 10:35 - 10:55: Shivesh Khaitan (Carnegie Mellon University):

  Motion Planning for Self-driving using Short-term and long-term Prediction and CILQR

- 10:55 - 11:15: Final Discussion & Plans for Future Competitions

Winner Announcement

We congratulate the team of Shivesh Khaitan, Qin Lin, and John Dolan from the Carnegie Mellon University as the winner of this competition. They receive the award of $3000 sponsored by **IVEX**.

Updates

01.09.21: The end of the competition is near and there are already several successful submissions. To give all participants more time to improve their planning algorithms, we **extend the deadline for two days until Friday, 23:59 GMT**.

01.08.21: The submissions for the second phase are now open and details on the submission of docker images have been published. The submission for the first phase is still possible until the end of the competition.

06.07.21: The submission for the first phase is open now.

01.07.21: The scenarios and updated software for the first phase have been published, see Rules and Details.

18.05.21: Sign up to the newsletter to get notified about important updates regarding the competition.

18.05.21: The rules and timeline have been detailed, see Rules and Details.

Prize Sponsor

Acknowledgment

For a PDF version of this call, see here: download.

* Announcement

📖 Rules and Details

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