

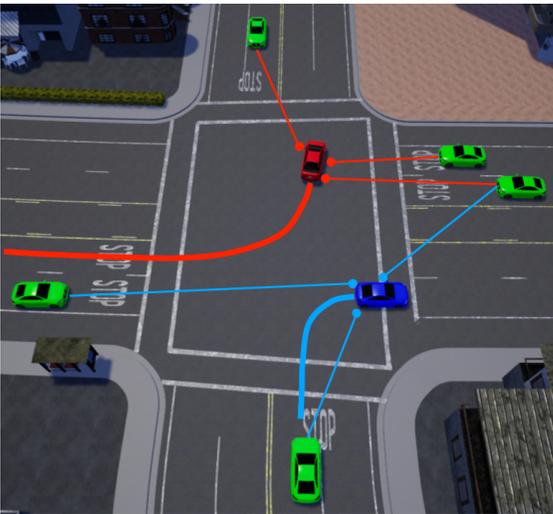
NRI: FND: COLLAB: Distributed, Semantically-Aware Tracking and Planning for Fleets of Robots

Award #: IIS-1830419 (Temple), IIS-1830402 (Stanford)

Lead-PI: Philip Dames (Temple University); PI: Mac Schwager (Stanford University)

Challenge

- Ensure safe and dependable operation of fleets of AVs or drones in a fast-paced dense urban environments



Solution

1. Deep Net-based object detection, segmentation, and classification
2. Distributed multi-target tracking algorithms for scalability
3. Distributed, semantically aware planning for safe navigation

Scientific Impact

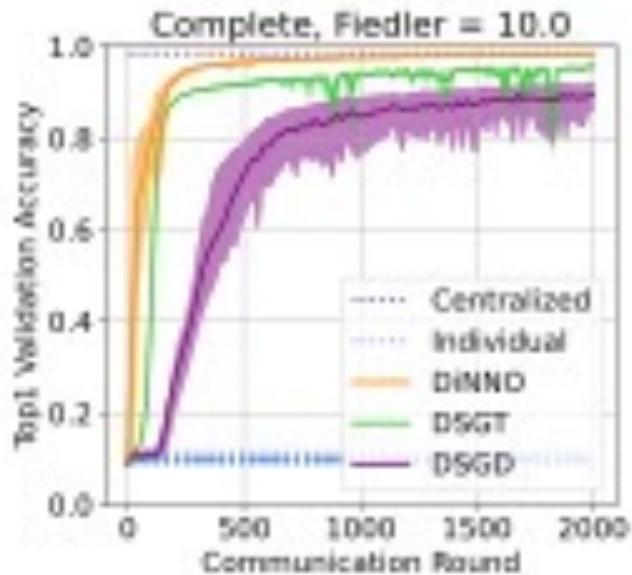
- Distributed optimization in general
- Sensor networks, social networks, IoT

Broader Impacts

- Improve robot safety
- Support student mentorship at all levels (undergrad, MS, PhD)
- Inclusion in UG and G courses
- Lab tours for K-12 students

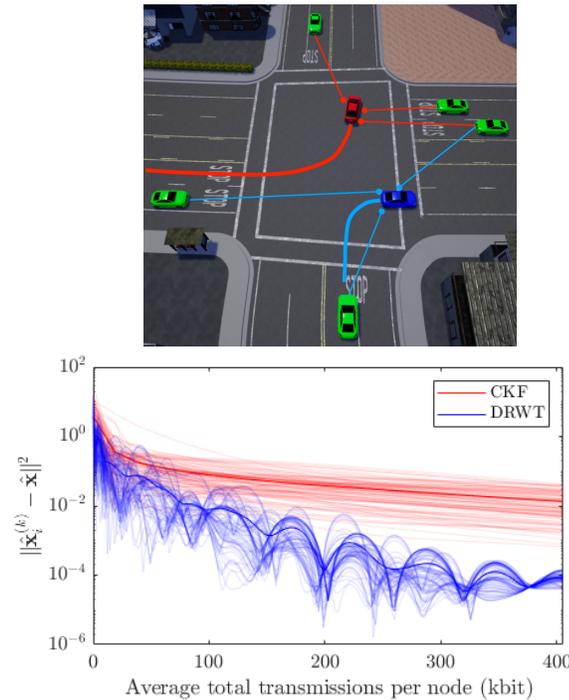
Results

Detection, Segmentation, Classification



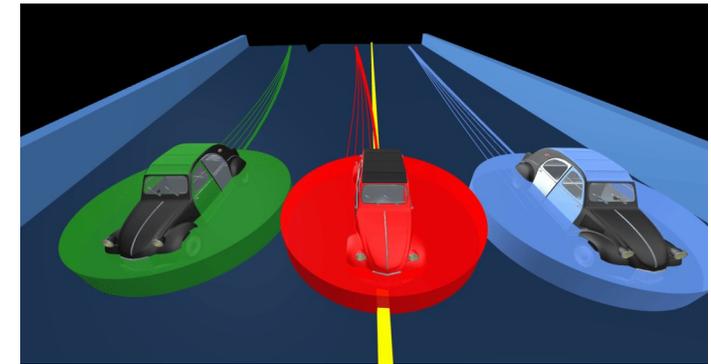
Yu et al, ICRA 22

Distributed Target Tracking

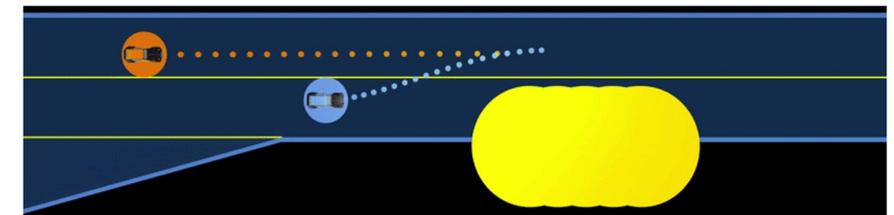


Shorinwa et al, ICRA 20

Game Theoretic Planning



Le Cleac'h et al, AURO 22



Le Cleac'h et al, RAL 21