CALL FOR PAPERS

Workshop on “The Role of AI/Machine Learning in the Evolution of Connected Vehicles”

IEEE ANTS 2020

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https://ants2020.ieee-comsoc-ants.org/authors/workshops/the-role-of-ai-machine-learning-in-the-evolution-of-connected-vehicles/

Key Deadlines

Paper submission deadline: 10/31/2020
Decision notification to authors: 11/15/2020
Final paper & copyright submission deadline: 11/22/2020

Description

The field of connected vehicles stands at the confluence of three evolving disciplines – the Internet of Things (IoT), emerging standards for connectivity of vehicles, and AI/machine learning. The number of connected IoT devices is expected to grow from 9.5 billion devices in 2019 to 22.5 billion devices in 2025 [1]. More optimistic estimates project the number of IoT devices in 2025 to be 55 billion connected devices [2]. Consequently, applications of IoT devices have rapidly expanded to integrate intelligent sensing and processing along with smart applications of the technology into various fields such as smart homes, smart appliances, enterprises, smart transportation including connected vehicles, smart cities, agriculture, energy, security, healthcare, shopping, location-based services including tracking and other similar fields. The exponential growth of IoT is transforming the quality of living of human beings around the globe.

Fueling the growth in the evolution of vehicles towards total automation is the development of novel sensors, 3D cameras, lidars and radars and their ability to connect to the Internet, upload the data to a cloud. The sensors of an autonomous vehicle collect anywhere from 1.4 TB to 19 TB of data per hour. Whether or not the vehicles are autonomous, one of the key features of connected vehicles is that they are able to share data between themselves in real-time. For example, the scene of an accident or road work encountered by a vehicle can be immediately shared with vehicles it is connected

to. Thus vehicles may learn about accidents or road work well in advance so as to enable them to make smart decisions and establish alternate routes to their destinations. The workshop will help in understanding the role of these sensors with use cases.

The vast amount of raw data collected must by mined for it to become useful in ensuring traffic safety by means such as intelligent rerouting of traffic or distribution of information on roadwork activities or accidents. Machine learning is a mechanism that has become extremely powerful in extracting meaningful data. A number machine learning algorithms exist and can be broadly classified under unsupervised, supervised, and reinforcement learning algorithms. A number of algorithms exist under each category. The workshop will address the impact of machine learning and their applications to connected vehicles with several use cases.

Scope

The workshop will address a number of technical issues involving the application of artificial intelligence/machine learning to connected vehicles such as, but not limited to, the following:

- 3D computer vision in connected vehicles
- Action and behavior recognition of drivers/vehicles in connected vehicles
- Adversarial learning, adversarial attack and defense methods in connected vehicles
- Biometrics, face, gesture, body pose of driver in connected vehicles
- Computational photography, image and video synthesis in connected vehicles
- Efficient training and inference methods for networks in connected vehicles
- Explainable AI, fairness, accountability, privacy, transparency and ethics in connected vehicles
- Image retrieval in connected vehicles
- Low-level and physics-based vision analysis in connected vehicles
- Machine learning architectures and formulations in connected vehicles
- Motion and tracking in connected vehicles
- Neural generative models, auto encoders, GANs in connected vehicles
- Optimization and learning methods in connected vehicles
- Recognition (object detection, categorization) in connected vehicles
- Representation learning, deep learning in connected vehicles
- Scene analysis and understanding in connected vehicles
- Segmentation, grouping and shape in connected vehicles
- Transfer, low-shot, semi- and un- supervised learning in connected vehicles
- Video analysis and understanding in connected vehicles
- Vision + language, vision + other modalities in connected vehicles

- Visual reasoning and logical representation in connected vehicles
- General Machine Learning (active learning, clustering, online learning, ranking, reinforcement learning, semi-supervised learning, time series analysis, unsupervised learning, etc.) in connected vehicles
- Deep Learning (architectures, generative models, deep reinforcement learning, etc.) in connected vehicles
- Learning Theory (bandits, game theory, statistical learning theory, etc.) in connected vehicles
- Optimization (convex and non-convex optimization, matrix/tensor methods, sparsity, etc.) in connected vehicles
- Probabilistic Inference (Bayesian methods, graphical models, Monte Carlo methods, etc.) in connected vehicles
- Trustworthy Machine Learning (accountability, causality, fairness, privacy, robustness, etc.) in connected vehicles

Potential authors are invited to submit papers via EDAS available at the link:

Submission Link

https://edas.info/newPaper.php?c=27510&track=104194

The papers should follow the IEEE conference format.

Workshop Chairs

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