



ACML 2021 Workshop on Machine Learning for Mobile Robot Vision and Control (MRVC)

About This Workshop

In recent years, the advances in machine learning for vision and control applications support the increasing demands for mobile robots. Such demands surge especially in the past several months, arguably due to the spread of COVID-19. While mobile robots are typically expected to work in controlled environments (e.g., supply chain automation at factories), more challenging unconstrained situations (e.g., cleaning, sanitizing, etc.) have also begun attracting attention, which in turn causes automation and safety of mobile robots to become a serious concern.

To enable mobile robots to meet such demands, equipping them with satisfactory vision and control capabilities is necessary and has become the key focus of relevant robotic research endeavors. Many sophisticated computer vision / machine learning / robotics approaches have been developed to meet this aim, including but not limited to semantic segmentation, optical flow estimation, depth estimation, object detection and tracking, domain adaptation, sim-to-real transfer, reinforcement learning and imitation learning for robot navigation. However, these advances have not yet been properly translated to significant progress in practical mobile robot applications due to the insufficiency of effective data samples from the real world, leading to unsatisfactory performance and safety concerns of mobile robots during deployment.

Moreover, effectively collecting data and efficiently utilizing them for training vision and control models, especially in unconstrained outdoor environments, have further raised a number of fundamental challenges for mobile robot applications. These challenges include several open but crucial issues, such as multimodal sensing, privacy issues, human activity recognition and prediction, as well as the constraints on batteries, computing capabilities, and limited field of view.

To better understand the aforementioned issues and improve the current solutions, this MRVC workshop presents a timely opportunity to bring together researchers in computer vision, machine learning, and robotics communities together to discuss the unique challenges and opportunities for mobile robots.

Workshop Website: <https://mrv-2021.net/>



Call for Short Papers and Extended Abstracts (**Deadline: 10/15/2021**)

Please submit papers via <https://cmt3.research.microsoft.com/MRVC2021>

At MRVC-21, we will solicit contributions at the intersection of mobile robotics and machine learning and computer vision. Specific topics of interest will include:

- **Machine learning for mobile robot control**
 - Reinforcement learning and imitation learning for robot navigation and exploration
 - Cooperative multi-agent control, learning to cooperate and communicate
 - Probabilistic learning and representation of uncertainty in robotics

- **Machine learning for unconstrained and real environments**
 - Domain adaptation, meta learning, and sim-to-real transfer for mobile robots
 - Federated learning
 - Privacy-preserving ML

- **Computer vision for mobile robots**
 - Vision based localization and mapping (Visual Odometry, SLAM)
 - Low-level vision (optical flow, depth estimation)
 - Semantic segmentation
 - Trajectory forecasting
 - Human activity recognition and prediction
 - Multimodal perception, sensor fusion, and computer vision Embodied vision
 - Embodied vision

- **Other applications of learning in robot manipulation, navigation, driving, flight, and other areas of robotics**

Author guideline

All submissions should be in the [ACML-21 format](#) with a **maximum** of **eight** pages for short papers and **four** pages for extended abstracts, including the reference and appendices. **Both unpublished and already-published works are welcome.** Reviews will be single-blind. Accepted papers will be published on the workshop website and presented in the form of either short talks or posters. Please note that we will NOT publish any official proceedings so that participants can submit their work to future conferences based on the feedback from the workshop.

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