

**Title:** Role of attentional selection in smart transportation

**Theme of the Talk:** Computer Vision & Multimodal interaction, AI for Smart Transportation

**Speaker:** Dr. Prerana Mukherjee

**Date and Time:** 25th July, 2023, 4 PM at RM-101

**Abstract:**

In this talk, the focus will be on selective attentional processing, also known as saliency, in the application domain of smart transportation. Selective attention involves the appropriate processing of visual stimuli to identify and locate important objects. While there are many salient object detection algorithms available that can solve various aspects of object localization and segmentation, they require abundant training data and sophisticated resource engines. Additionally, it is still difficult to capture interesting patterns such as convexity and smoothness of region boundaries locally.

There is a growing research push for safer and an Adaptive Driver Assistance System (ADAS) with different levels of autonomy. This requires state-of-the-art technologies such as AI/ML with 5G and beyond technologies to achieve an accurate and real-time recommendation engine. Most prior work in smart transportation has focused on streamlined traffic conditions. These solutions rely on heterogeneous sensor networks to provide necessary recommendations for drivers. However, integrating camera data from vehicles is becoming more common.

Unstructured road conditions pose many challenges, including different road profiles, chaotic and heterogeneous traffic conditions, varying traffic densities, potholes and broken dividers, and different types of traffic flow. Leveraging attentional selection in designing efficient algorithms for different use cases in smart transportation can help address these challenges.

**Speaker Bio:**

Dr. Prerana Mukherjee is currently working as Assistant Professor, Department of Computer Science, School of Engineering, JNU. Previously, she was working as Assistant Professor, CSE at IIT Sri City from Nov'18-Mar'20. She has been actively involved in guiding 13 B.Tech and 1 PhD student in the areas of Computer Vision and interjunction of IoT and CV. She has led as a Director an initiative named Celestini Project India 2017, 2018 2019 in collaboration with Marconi Society, Google Brain and IIT Delhi which encourages undergrad students to work on socio-economic problems in India. Under this initiative, an android app Air Cognizer was developed which helps Delhi citizens to predict the air quality index which has been showcased in TensorFlow Dev Summit 2019 and covered in leading media coverages. Apart from that, solutions to road safety in chaotic Indian traffic scenarios and air pollution forecasting in Delhi have been developed. Prior to that, she has completed her PhD'18 (IIT Delhi) on research problem statement of "Salient Object Localization and Segmentation". She has received M.Tech from Delhi Technological University (DTU) in 2013. She has published several papers in top-tier conferences and journals and member to several reputed professional bodies such as IEEE SPS, IUPRAI Life Member, Computer Vision Foundation (CVF) member, INSTICC member, MIR Labs.

Her research interests include broad areas of vision (2D, RGBD 3D point cloud based object localization tracking, scene analysis, remote sensing and image/video processing), Learning Problems (Generative

models, deep learning, sequential modelling and transfer learning), Biometrics, Pattern Recognition, Data Mining.

More details can be found at: <https://mprerana.github.io/DrPreranaMukherjee>