



Scheme for Promotion of Academic and Research Collaboration



Lecture Series under SPARC

COMPUTING TECHNIQUES FOR URBAN MOBILITY AND SMART PARKING

28-30 January 2021

SUMMARY

This series will introduce students to concepts of smart parking focusing mainly on parking occupancy detection using sensors. The lectures will introduce principles of computer-vision for mobility applications focusing on images and LiDAR dataset. The lectures will provide theoretical basis for image-based parking occupancy detection followed by tutorials on deep-learning techniques for parking occupancy detection.

SPEAKERS:



Prof. Kourosh Khoshelham
University of Melbourne



Dr. Debaditya Acharya
University of Melbourne

Register at:

<https://forms.gle/ipCzFvTxEyxL2rj8>

Register before January 26, 2021

Contact: ncgiitk.school@gmail.com

Lecture Series under SPARC

Lecture 1: Sensors for parking occupancy detection

Prof. Kourosh Khoshelham 28 January 2021 [9:00-10:30 A.M. (IST)]

- The concept of smart parking.
- Review of sensor technologies for parking occupancy detection.
- A comparison of existing sensors in terms of accuracy, reliability, and cost.
- Open challenges in parking occupancy detection.

Lecture 2: Computer-vision techniques for mobility applications

Prof. Kourosh Khoshelham 29 January 2021 [9:00-10:30 A.M. (IST)]

- Review of computer vision techniques in urban mobility and transport systems.
- Focus on imagery and LiDAR point clouds as the main data modalities.
- computer vision tasks, including classification, segmentation, object detection and tracking.
- Applications of various techniques to data captured by sensors.

Lecture 3: Image-based parking occupancy detection

Dr. Debadyta Acharya 30 January 2021 [9:00-11:00 A.M. (IST)]

- A parking occupancy detection using a deep-learning classification network applied to CCTV images.
- Theoretical basis for image-based parking occupancy detection

Tutorials:

Dr. Debadyta Acharya 30 January 2021 [9:00-11:00 A.M. (IST)]

- Two MATLAB tutorials help to implement the methodology.
- Fine-tuning a pre-trained deep neural network to determine the occupancy of the parking spaces.
- spatio-temporal analysis of the detections made for automatic parking slot delineation.