DISTINGUISHED LECTURE SERIES 2022/23

IMPROVING OBJECT DETECTION FROM REPEATED TRAVERSALS OF THE SAME ROUTE

19 MAY 2023 (FRI)
9:30 – 10:30 AM (HKT)

Online via Zoom

PROF. KILIAN WEINBERGER

Professor
Department of Computer Science
Cornell University

Abstract:

Recent progress in autonomous driving has been fuelled by improvements in machine learning. Ironically, most autonomous vehicles do not learn while they are in operation. If a car is used in the same location multiple times, it will act identically every single time. We propose to leverage and learn from repetition by allowing a neural network to save some of its activations in a geo-referenced data base that can be retrieved later on. If a vehicle is used in the same location multiple times, it builds up a rich data set of past network activations that aid object detection in the future. This allows it to recognize objects from afar when they are only perceived by a few pixels or LiDAR points. We further demonstrate that it is in fact possible to completely bootstrap an object detection classifier only based on repetition. Our approach has the potential to drastically improve the accuracy and safety of self-driving cars, enable them for sparsely populated areas, and allow them to adapt naturally to their local environment over time.

Enquiries: +852 3411 2385 / comp@comp.hkbu.edu.hk

香港浸會大學 HONG KONG BAPTIST UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE 計算機科學系

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Event Registration