



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**An Autonomous Vehicle-Based
Public Transportation System**

by

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Date : 5 July, 2016 (Tue.)
Time : 11:00am – 12:00noon
Venue : Room 1009, William M.W. Mong Engineering Building
The Chinese University of Hong Kong

Abstract

Technology of autonomous vehicles (AVs) is getting mature and many AVs will appear on the roads in the near future. AVs become connected with the support of various vehicular communication technologies and they possess high degree of control to respond to instantaneous situations cooperatively with high efficiency and flexibility. In this talk, a new AV-based public transportation system is proposed. It manages a fleet of AVs to accommodate transportation requests, offering point-to-point services with ride sharing. We discuss the three major problems of the system: scheduling, admission control, and pricing. Scheduling is to configure the most economical schedules and routes for the AVs to satisfy the admissible requests while admission control is to determine the set of admissible requests among all requests to produce maximum profit. We develop effective methods to tackle the admission control and scheduling problems. Furthermore, we consider multi-tenancy, which can increase market competition leading to lower service charge and higher quality of service. We study the pricing issue of the multi-tenant AV public transportation system with three types of services defined. To prevent the bidders from raising their bids for higher returns, we propose a strategy-proof Vickrey-Clarke-Groves-based charging mechanism, which can maximize the social welfare, to settle the final charges for the customers. We perform extensive simulations to evaluate the performance of the proposed methods.

Biography

Albert Lam received the BEng degree (First Class Honors) in Information Engineering from The University of Hong Kong (HKU), Hong Kong, in 2005, and obtained the PhD degree at the Department of Electrical and Electronic Engineering (EEE) of HKU in 2010. He was a postdoctoral scholar at the Department of Electrical Engineering and Computer Sciences of University of California, Berkeley, in 2010-12. He is a Croucher research fellow and now a research assistant professor at HKU-EEE. His research interests including optimization theory and algorithms, evolutionary computation, smart grid, and smart city.

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