

出國報告（出國類別：訪問）

應用即時演算法於智慧製造價值鏈

服務機關：國立清華大學工業工程與工程管理學系

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派赴國家：香港（香港中文大學）

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摘要

200-300字，下為範例：

本次學術訪問機構為香港中文大學(Chinese University of Hong Kong)的理論科學中心(Institute of Theoretical Computer Science and Communications)，其主持接待為 Zhang, Shengyu 教授，而中心主任是姚期智院士，他同時也是台灣中研院的院士。此次訪問，我們希望能夠借助我們這幾年在「即時演算法」上的理論分析成果，能夠與 ITCSC 這幾年發展的 online decision learning (即時決策機器學習)討論合作的可能性。訪問過程中，並藉此了解他們這幾年系上的各種研究方向與招生情況。本人也很榮幸地在五月四號的下午給予一場邀請演講。

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壹、目的

本次訪問的主要目的，主要希望能夠借助我們這幾年在「即時演算法」上的理論分析成果，能夠與 ITCSC 這幾年發展的 online decision learning 「即時決策機器學習」討論合作的可能性。訪問過程中，並藉此了解他們這幾年系上的各種研究方向與招生情況。本人也很榮幸地在五月四號的下午給予一場邀請演講。

貳、過程

此次受邀的學術訪問機構為香港中文大學(Chinese University of Hong Kong)的理論科學中心(Institute of Theoretical Computer Science and Communications)，其主持接待為 Zhang, Shengyu 教授。ITCSC 的主要研究領域為各種演算法和計算理論上的研究議題，目前中心主任是姚期智院士，他同時也是台灣中研院的院士，本人也很榮幸地在五月四號的下午給予一場邀請演講(詳見附件)。

本次訪問，我們希望能夠借助我們這幾年在「即時演算法」上的理論分析成果，能夠與 ITCSC 這幾年發展的 online decision learning (即時決策機器學習)討論合作的可能性。訪問過程中，本人亦在周四中午與香港中文大學計算機科學系大部分的 faculty 一起用餐，藉此了解他們這幾年系上的各種研究方向與招生情況。

接下來，除了在演講階段與聽眾有互動討論之外，最特別的是與兩位 ITCSC 的博士後研究學者，分別討論電動車路徑規劃議題及智慧電網的研究，這也剛好都是目前本實驗室團隊正在主力研究的方向。最後，我們並與 Zhang, Shengyu 教授討論之後的研究方向，以及未來學生交流及合作的可能性，並期待之後能有更進一步的研究成果。

參、心得與建議

一、心得：

我們與 Zhang, Shengyu 教授討論之後在「即時演算法」和「即時決策機器學習」的研究方向，以及未來學生交流及合作的可能性，並期待之後能有更進一步的研究成果。

二、建議：

此次在香港中文大學的理論科學中心訪問的收穫良多，對於接下來進一步的國際合作相信將可具體進行。希望能夠藉由科技部或是本校校內計畫的經費支持，先以交換研究生專案的方式合作，繼續維持雙邊學術合作的橋樑，同時也促使本系或本校的學生能夠在此過程中，進行交換或雙邊互訪，達到學習國際合作的目標及研究成果。

肆、附錄

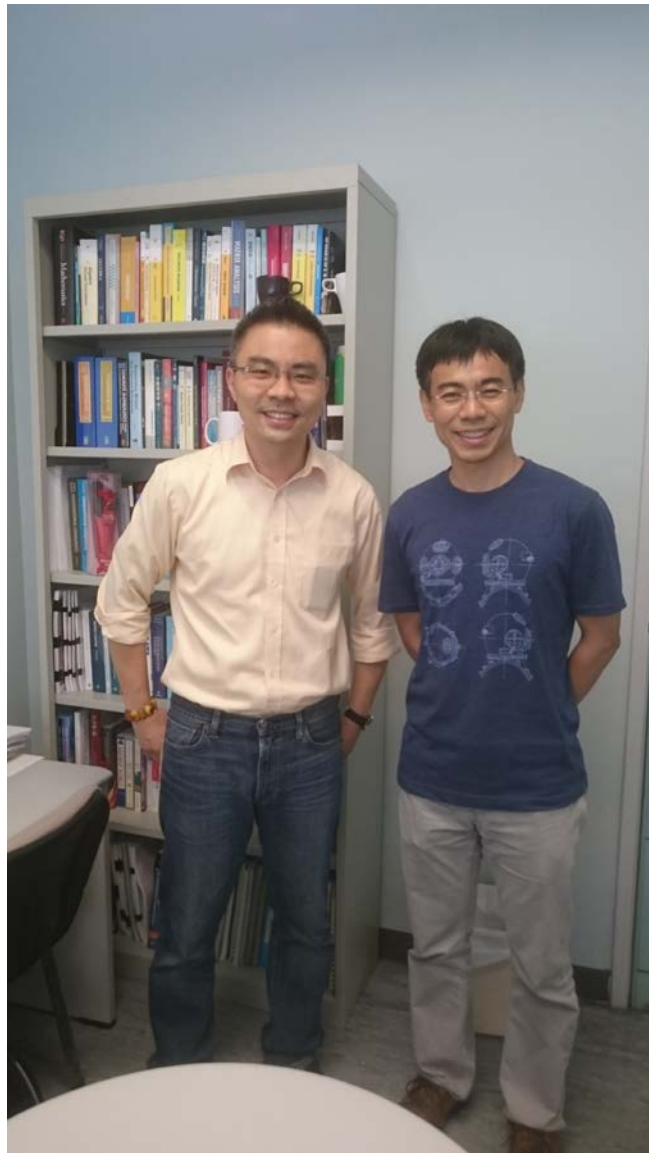
一、附件 1

邀請信件

二、附件 2

邀請演講海報

三、活動照片



與 Zhang, Shengyu 教授(右一)於他辦公室合影

Invitation from ITCSC, CUHK

Chung-Shou Liao <csliao@ie.nthu.edu.tw>

Wed, Mar 15, 2017 at 3:47 AM

To: "Pui Ying Cheung (ITCSC)" <rachelpycheung@cuhk.edu.hk>

Cc: Shengyu Zhang <shengyuzhang@gmail.com>, syzhang@cse.cuhk.edu.hk

Dear Rachel,

Thanks for the message. It's my pleasure to visit ITCSC at CUHK and give a talk on May 4 (Thu).

Look forward to seeing you all. :)

Best,
Shou

On Mon, Mar 13, 2017 at 4:54 PM, Pui Ying Cheung (ITCSC) <rachelpycheung@cuhk.edu.hk> wrote:

Dear Prof Liao,

On behalf of Institute of Theoretical Computer Science and Communications (ITCSC), I am pleased to invite you to deliver a talk on 04 May 2017 at the Chinese University of Hong Kong (CUHK).

Please confirm your acceptance of our invitation by return. An official invitation letter will follow upon receiving your acceptance.

Should you have any enquiry, please feel free to contact me for further assistance.

Regards,

Rachel Cheung

Rachel CHEUNG

Project Coordinator

Institute of Theoretical Computer Science and Communications

The Chinese University of Hong Kong

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香港中文大學

The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

*CSE-ITCSC Joint Seminar***The Electric Vehicle Touring Problem**

By

Prof. Chung-Shou Liao*Associate Professor, Dept. Industrial Engineering and Engineering Management,
National Tsing Hua University***04 May 2017, Thursday****2:00 pm – 3:00 pm****Room ERB1009 William M. W. Mong Engineering Building, CUHK****Abstract:**

The increasing concern over global warming has led to the rapid development of the electric vehicle industry. Electric vehicles (EVs) have the potential to reduce the greenhouse effect and facilitate more efficient use of energy resources. In this talk, we investigate some optimal EV route planning problems that take into consideration of possible battery charging or swapping operations. Given a road network, the objective is to determine the shortest route that a vehicle with a given battery capacity can take to travel between a pair of vertices or to visit a set of vertices with several stops, if necessary, at battery switch stations. We present polynomial time algorithms for the EV shortest path problem and a fixed tour EV touring problem, where the fixed tour problem requires visiting a set of vertices in a given order. Based on the result, we also propose constant factor approximation algorithms for the EV touring problem, which is a generalization of the traveling salesman problem.

This is joint work with Shang-Hung Lu (NTHU) and Zuo-Jun Max Shen (UC Berkeley) and it has been published in Transportation Research Part B: Methodological.

Biography:

Prof. Liao joined the faculty of Dept. Industrial Engineering and Engineering Management, National Tsing Hua University (NTHU) in February 2010. He has served as an associate professor since August 2014. Before joining NTHU, he had worked at Algorithms and Computation Laboratory in Institute of Information Science, Academia Sinica for eight years. He obtained his Ph.D. degree and M.S. degree from Dept. of Computer Science and Information Engineering National Taiwan University, and the Combinatorial Mathematics group of Dept. Applied Mathematics, National Chiao Tung University, respectively.

Prof. Liao's research mainly focuses on designing efficient algorithms that can be used to solve difficult optimization problems from real applications. He has been interested in problems related primarily to combinatorial optimization and algorithms. His lab has developed approximation algorithms with theoretical analysis for well-known hard problems such as online shortest path, facility location, domination problems, and bin packing. In particular, Prof. Liao has extended his study to systems biology. He has designed graph-theoretic algorithms for global alignment between multiple biological networks and conducted comparative analysis across species to find functionally conserved clusters. The related results are published in the top conferences and journals such as ISMB, PSB, and Bioinformatics. Recently, his lab is exploring the area of online algorithms.

******* ALL ARE WELCOME *******