與國際導航界巨擘的對話

慣性導航科技
訓練課程暨工作坊

敬愛的貴賓 鈞鑒：

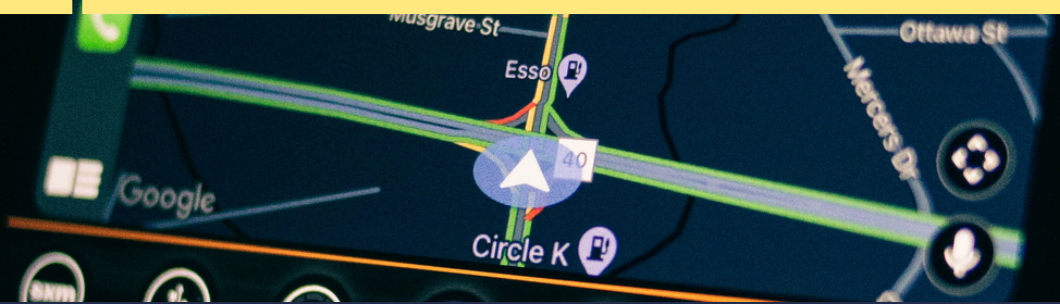
近年來自駕車為臺灣重點發展的項目之一，輔助自駕車上路運行以提升自駕安全性的關鍵要素，有賴於導航技術之開發與高精地圖之應用。今年本次活動共分成兩個主題，分別為2/21-2/22為期兩天的訓練課程，以及2/23一天的工作坊。在訓練課程方面，很榮幸邀請到國際導航界的巨擘，加拿大卡加利大學Prof. Naser El-Sheimy進行慣性導航科技授課。Prof. Naser El-Sheimy為加拿大Tier I 首席科學家，在多感測器系統整合、移動測繪系統、即時動態定位、及數位攝影測量等技術於交通、製圖、與地理資訊系統的應用做出巨大貢獻。在工作坊部分，邀請Prof. Naser El-Sheimy將與Micro Engineering Tech Inc. 的執行副總裁Dr. Mohamed Elhabiby，以及國內導航與高精地圖相關專家進行技術交流與實務經驗分享，期待透過工作坊的形式促進臺灣自駕車技術的蓬勃發展。本次活動將探討慣性導航科技、高精地圖經驗分享、與自駕車實務應用等相關議題，誠摯邀請您蒞臨參加。

活動相關資訊請參閱下述報名資料及官網。

	訓練課程	工作坊
時間	112年2月21-22日	112年2月23日
地點	成大會館3樓C廳	線上參與
繳費	$1000元（學生$500元）	免費
與會方式	實體	線上

訓練課程議程-D1

	February 21st (Tue.)
09:00 - 09:30	**Registration Time**
09:30 - 09:40	**Speech Time**
09:40 - 10:30	**Introduction to Inertial Navigation** • Principle of Inertial Navigation • Inertial sensors (Accelerometers and Gyroscopes)
10:30 - 10:50	**Tea Time**
10:50 - 11:40	**Introduction to Inertial Navigation** • Understanding Inertial Sensors Measurements
11:40 - 11:50	**Break Time**
11:50 - 12:40	**Introduction to Inertial Navigation** • Inertial Navigation Concept in 2D • Difference between ISA, IMU, and INS systems
12:40 - 14:00	**Lunch Break**
14:00 - 14:50	**Inertial Sensor Errors** • Inertial Sensors Errors • Effect of Inertial Sensor Errors on the Derived Navigation Parameters
14:50 - 15:00	**Break Time**
15: 00 - 15:50	**Inertial Sensor Errors** • Performance Characteristics of Inertial Sensors
15:50 - 16:10	**Tea Time**
16:10 - 17:00	**Inertial Sensor Errors** • Calibration of Inertial Sensors



訓練課程議程-D2

	February 22nd (Wed.)
08:30 - 09:00	**Registration Time**
09:00 - 09:50	**Modeling Motion using Inertial Data** • Mathematical notations in inertial navigation • Vectors and rotation matrices representation • Time derivatives of position, velocity, rotation matrices
09:50 - 10:10	**Tea Time**
10:10 - 11:00	**Modeling Motion using Inertial Data** • Transformations between computational frames • Modelling Equations in the Local-Level Frame
11:00 - 11:10	**Break Time**
11:10 - 12:00	**Modeling Motion using Inertial Data** • Mechanization Equations in the Local-Level Frames • Step by Step computation of the navigation parameters from the inertial sensor data
12:00 - 13:30	**Lunch Break**
13:30 - 14:20	**Modeling INS errors by linear State Equations And Kalman Filtering** • Derivation of the inertial state dynamic error model • Modelling Inertial Sensor Errors • Understanding the error behavior of inertial systems
14:20 - 14:30	**Break Time**
14: 30 - 15:20	**Modeling INS errors by linear State Equations And Kalman Filtering** • Introduction to Kalman filtering for optimal error estimation • Modeling INS errors by linear State Equations

訓練課程議程-D2

15:20 - 15:40	**Tea Time**
15:40 - 16:30	**Modeling INS errors by linear State Equations And Kalman Filtering** • Practical Issues for the implementation of update Measurements (ZUPT, CUPT, Integrated systems) • GPS/INS Integration Techniques

工作坊議程

	February 23rd, 2023 (Thu.)		
09:00 - 09:30	**Registration Time**		
09:30 - 09:40	**Opening Ceremony**		
09:40 - 10:30	**Session 1**	Navigation Technologies for Future Autonomous Vehicles	**Prof. Naser El-Sheimy** || Professor of University of Calgary & Tier I Canada Research Chair
10:30 - 10:40	**Break Time**		
10:40 - 11:10	**Session 1**	Piloting Autonomous Vehicles with HD Maps: Current Progress and Unsettled Problems	**Prof. Kai-Wei Chiang** || Professor of NCKU & Director of HD maps Center
11:10 - 11:20	**Break Time**		
11:20 - 11:45	**Session 1**	Accelerating Production of Self Driving Car HD Maps in Taiwan	**Dr. Victor Lu** || R&D manager of ITRI
11:45 - 12:10	**Session 1**	Digital Twin :HDMAP production Development in Taiwan	**Shin-Lin Tsai** || Vice President of RealWorld Surveying and Geomatics Corp.
12:10 - 13:30	**Lunch Break**		
13:30 - 14:20	**Session 2**	Gulo Gulo AI Sensor Fusion Solutions for Automated Vehicles and Infrastructure	**Dr. Mohamed Elhabiby** || Executive Vice President of METI

工作坊議程

14:20 - 14:45	Session 2	Performance of GNSS+INS on Smart Phone and Telematics of Vehicle	**Dr. Tsung-Yu Chiou** || Senior manager of MTK
14:45 - 15:10	Session 2	Dual-band low-power low-cost GNSS receiver	**Justin Yang** || Senior manager of AIROHA
15:10 - 15:30	**Tea Break**		
15:30 – 15:55	Session 2	Auto-valet-parking: a special use case of self-driving	**Steven Chuang** || Technical manager of oToBrite
15:55 – 16:20	Session 2	Map-Based Localization of Autonomous Vehicles Using existing ADAS Camera	**Jon Su** || RD director of GallopWave
16:30 - 17:00	**Panel Discussion / Closing Ceremony**		

活動官網

報名網址

訓練課程

主辦單位

NSTC 國家科學及技術委員會 National Science and Technology Council

TASA 國家太空中心 Taiwan Space Agency

協辦單位

中華民國 內政部 地政司 Dept of Land Administration, M. O. I.

執行單位

HD MAPC High Definition Maps Research Center

成大研究發展基金會 NCKU Research and Development Foundation

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