



## 國立臺北大學 114 學年度 高教深耕計畫 - 執行成果紀錄

分項計畫	1-3.3-1 『深化教學研國際合作』	
活動名稱	德國 Prof. Dr. Javad Ghofrani 來訪短期授課學術交流、洽談國際合作 Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.德國波昂-萊茵-錫格應用技術大學	
活動日期	114 年 09 月 09 日	
活動時間	15 時 10 分~21 時 10 分	
活動地點	國立臺北大學	
活動內容	Title: Collective Robotics II	
活動成效	<p>Prof. Dr. Javad Ghofrani 教授主題聚焦「Collective Robotics (群體機器人)」。</p> <p>講者從生物靈感與數理建模雙軌出發，說明如何以局部互動 (local interactions) 產生全域秩序 (global order)，並連結到多智能體系統在工程上的設計原理與實作脈絡，協助與會師生建立完整的理論—模型—應用框架。</p> <p>課程首先以自組織 (self-organization) 為核心，透過多個生物案例引導學習：例如蟋蟀的聲音辨識與定位 (phonotaxis，涉及神經反應延遲與「leaky integration」如同低通濾波)、蝗蟲的群體運動與螞蟻估計巢穴面積等，說明在隨機擾動、正/負回饋與多重互動下，局部規則可湧現穩定的群體行為。進一步比較群體機器人相較單體機器人的三大優勢：Robustness (冗餘、無單點失效)、Flexibility (成員同質、硬體不必過度專業化) 與 Scalability (相同演算法可隨規模擴張)。</p>	
活動照片 (至少 2 張並檢附說明)		Prof. Dr. Javad Ghofrani 教授和臺北大學的學生進行一些課程的考驗，讓學生能理解真正的知識。



Prof. Dr.  
Javad  
Ghofrani 教授向與會者親近的討論問題，並且詳細的說明問題。

活動文宣

NATIONAL TAIPEI UNIVERSITY

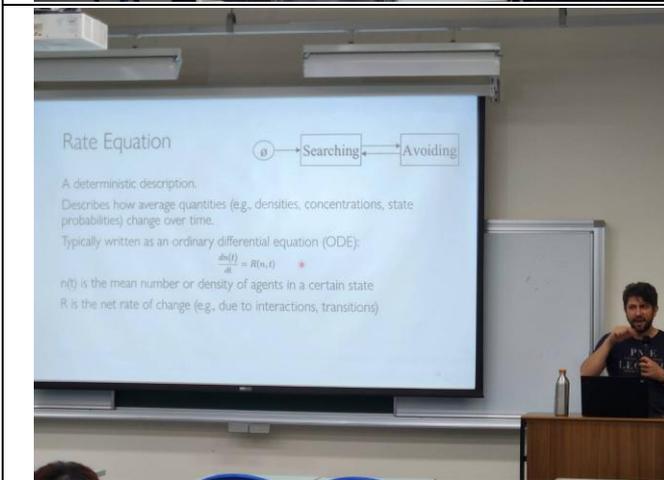
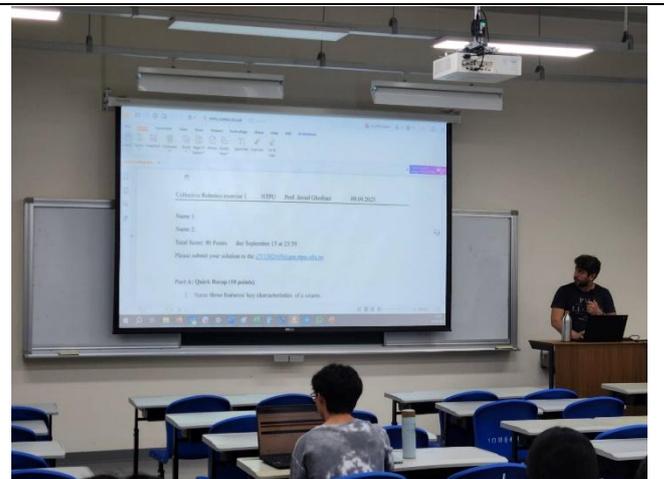
Welcome to College of EECS,  
2025

Prof. Dr. Javad Ghofrani  
University of Applied Sciences Bonn Rhein-Sieg  
德國波昂-萊茵-錫格應用技術大學

Time: 2025/09/04 Collective Robotics I  
Time: 2025/09/09 Collective Robotics II  
Time: 2025/09/11 Collective Robotics III  
Time: 2025/09/12 Evolutionary Robotics

Organizer : College of EECS  
NTPU Higher Education Sprout Project of 2025

活動紀錄：黃志緯





國立臺北大學 NTPU

電機資訊學院

College of Electrical Engineering and Computer Science



Hochschule  
Bonn-Rhein-Sieg  
University of Applied Sciences

### PROGRAM AT GLANCE(活動安排一覽)

Date: September 4 || September 9 || September 10 || September 11 || September 12, 2025

Host Universities : National Taipei University, Taiwan.

Organizer : College of Electrical Engineering and Computer Science.

Speaker: Prof. Javad Ghofrani

Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.

Title: Collective Robotics I

Duration: 13:30 to 17:30 (4 Hours) Sept 4, 2025

Speaker: Prof. Javad Ghofrani

Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.

Title: Collective Robotics II

Duration: 15:10 to 21:10 (6 Hours) Sept 9, 2025

參與者：Prof. Javad Ghofrani 和電機資訊學院楊棧雲院長、宋啟嘉電機系主任、曾俊元資工系主任、魏存毅通訊系主任、前瞻中心陳建宏主任、楊世任教授

Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.

Title: 電機資訊學院談國際合作、分享學院及學術互相交流

Duration: 11:00 to 15:00 (4 Hours) Sept 10, 2025

Speaker: Prof. Javad Ghofrani

Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.

Title: Collective Robotics III

Duration: 15:10 to 21:10 (6 Hours) Sept 11, 2025

Speaker: Prof. Javad Ghofrani

Institution: Head of the Institute for Artificial Intelligence and Autonomous Systems, Bonn Rhein-Sieg University of Applied Sciences, Department of Computer Science , Sankt Augustin, Germany.

Title: Seminar 專題研討會-Evolutionary Robotics 進化機器人技術

Duration: 13:30 to 17:30 (4 Hours) Sept 12, 2025