SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 25.10.2021 (י"ט בחשון תשפ"ב), בשעה 14:30 סמינר יתקיים באמצעות הזום:
https://technion.zoom.us/j/99689262410

מרצה:

Professor Jianliang Wang, PhD
Department of Autonomous Intelligent Systems
Hangzhou Innovation Institute of Beihang University
wjl-180@hotmail.com

על הנושא:

Coordinated UAV Platoons/Formations and Aerial Manipulators

The seminar will be delivered in English

להלן תקציר ההרצאה:

Increasing commercial and private vehicle traffic motivates a growing interest in platoons/formations, which, on land, can be highway traffic in Intelligent Transportation Systems (ITS) and Highspeed Trains (HST). They can be airborne UAVs and spacecrafts in outer space as well. The main goals of platoon control are to maintain a desired and safe distance between consecutive vehicles in a platoon and increase the capacity of traffic flow by reducing the inter-vehicle spacing, while maintaining a safe distance to avoid collision. Since vehicles in a platoon are dynamically coupled, disturbances acting on one vehicle may affect other vehicles. Hence, the important concept of string stability where the inter-vehicle spacing errors are required to remain bounded as they propagate upstream from one vehicle to another. Alternatively, amplification of the spacing errors in the upstream direction (i.e., string instability), may result in poor ride quality and even collisions. Commonly used inter-vehicle spacing policies include constant spacing (CS) policy and constant time headway (CTH) policy.
This seminar will cover the design of advanced vehicle control algorithms and good spacing policies to achieve string stability and avoid inter-vehicle collision that existing algorithms suffer from, especially in the presence of nonzero initial spacing errors, disturbances, system nonlinearity, actuator saturation, etc. Extension of the result to multi-dimensional UAV formation control via consensus in a multi-agent system setting will also be discussed with flight test validation. In this respect, our current work on aerial manipulators combining drones with robotics will be reported. Preliminary results on new control design algorithms and test results will be presented.
Finally, plans for future research will be discussed for further extension of the research work to include compliance interactions among the aerial manipulators and with the task environments, and the coordinated manipulation and transportation of objects using multiple aerial manipulators.

מארח: פרופ' מיכאל שפירא

בברכה,

פרופ"ח אתי סאס
מרכז הסמינרים