THE UNIVERSITY OF HONG KONG

DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

Online

Title: **Integrated Relative Localization and Rigid Formation Control with Prescribed Performance of Multi-Agent Systems**

Speaker: **Mr. Dun Zhang (PhD candidate)**
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Date: **29 April, 2021 (Thursday)**

Time: **11:15 a.m.**

Zoom Link: **1) Link to join the meeting:**

https://hku.zoom.us/j/99701722528?pwd=cmtuVXJYUWNSZjQ1VCszYm50Uy9jQT09

2) Meeting ID: 997 0172 2528

3) Password: 757178

Abstract:
The cooperative control of multi-agent systems (MASs) is attracting substantial research efforts due to both its theoretical challenges arising in coordination and control and its practical potential in a wide range of applications. Through local interactions amongst the agents, the aim is to coordinate them for achieving a global group behavior that is beyond the capability of the individual agent. The control problems in MASs are mainly classified into consensus, formation, and containment. In particular, formation control refers to the design of appropriate control protocols for stabilizing agents' positions with respect to each other so that they set up and maintain a predefined geometric shape. The

challenging problems are as follows: 1) The transient performance of the formation cannot be ensured; 2) Related works only focus on the single integrator model, and it is still unclear how to achieve the control of double integrator; 3) Formation control requires the information of the relative positions of the agents. However, no exteroceptive sensor can directly provide the relative position measurement. Motivated by these drawbacks, this work investigates the simultaneous relative localization and rigid formation control problem of MASs, in which the unique shape of the formation is ensured by only controlling the inter-agent distances, prescribed performance control is achieved to guarantee the transient performance of the formation, and the relative localization between any two neighbors is estimated based on the inter-agent velocity and distance. Finally, the effectiveness of the proposed control scheme is evaluated by a simulation.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. J. Lam at 3917 2805.

Research area: Robotics and Control