

אגוד ישראל לבקרה אוטומטית - איב"א

ISRAEL ASSOCIATION for AUTOMATIC CONTROL

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National Member Organization of:



הזמנה ליום עיון בנושא:

Foundations of Formation Control: Theory and Applications

Lecturers:

Prof. Daniel Zelazo, Technion, Israel

Prof. Angelo Cenedese, University of Padua, Italy

שייערך במלון "דניאל", הרצליה

יום ב', 11 לנובמבר, 2019

The coordination and control of teams of dynamical systems, also referred to as *multi-agent systems*, has in recent years emerged as an enabling technology for a diverse range of application domains in the industrial, civil, and military fields. This workshop focuses on one of the canonical problems for multi-agent systems known as *formation control*. Stated simply, formation control addresses the problem of having a team of autonomous agents arrange themselves into some desired spatial configuration using only local sensing. Interestingly, to address this problem all aspects of control engineering are summoned, from modeling to estimation and the correct design of control algorithms.

In this workshop, we present an overview of recent results in this area, with a focus on the use of rigidity theory as the main mathematical tool for defining formations and distributed control strategies. We highlight this rigidity based framework through examples and theory, and show that a wide range of other problems, including localization, camera calibration, and swarming can also be approached with these tools.

Organizer: Daniel Zelazo, Technion

Foundations of Formation Control: Theory and Applications

11 November 2019

Program

08:30 Registration

08:55 Opening (Moshe Idan – President, IAAC)

09:00 **Lecture 1** The Formation Control Problem (DZ)

10:00 **Lecture 2** A Survey of Applications (AC)

10:45 *Coffee break*

11:10 **Lecture 3** How to Define Formations: Rigidity Theory (DZ)

11:50 **Lecture 4** Rigidity Theory and Formation Control:
Distance Constrained Formations (AC)

12:45 *Lunch break*

14:15 **Lecture 5** Rigidity Theory and Formation Control:
Bearing Constrained Formations (DZ)

15:15 **Lecture 6** Formation Maneuvering (AC)

16:00 *Coffee break*

16:15 **Lecture 7** From Formations to Swarming (AC)

16:50 **Lecture 8** Outlooks (DZ)

17:30 **End**

About the lecturers:

Daniel Zelazo is an associate professor of Aerospace Engineering at the Technion - Israel Institute of Technology. He received his BSc. (99) and M.Eng (01) degrees in Electrical Engineering from the Massachusetts Institute of Technology. In 2009, he completed his Ph.D. from the University of Washington in Aeronautics and Astronautics. From 2010-2012 he served as a post-doctoral research associate and lecturer at the Institute for Systems Theory & Automatic Control in the University of Stuttgart. His research interests include topics related to multi-agent systems, optimization, and graph theory.

Angelo Cenedese is an associate professor of Automation Engineering at the University of Padova - Department of Information Engineering. He received his Laurea Degree in Electronic Engineering (99) and the Ph.D. in Energy Science from the same University. He is the scientific responsible of the industrial research laboratory NAVLAB and of the Flying Arena Laboratory, and leader of the SPARCS (Space and Aerial Control Systems) Group, at the Dept. of Information Engineering. His research interests include system modeling, control theory and its applications, sensor and actuator networks, multi-agent systems. On these subjects, he has published more than 150 papers and holds three patents.

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טופס הרשמה :

שם: _____

כתובת: _____

דוא"ל: _____

מקום עבודה: _____

טלפון: _____ פקס: _____

דמי השתתפות (כוללים ארוחת צהרים, כיבוד וזכות הורדת חומר ההרצאות):

רישום מוקדם עד **3.11.2019** ₪ 480

רישום החל מ- **4.11.2019** ₪ 530

סטודנט (בזמן מלא) ₪ 250

מצורפת המחאה ע"ס _____ ₪ לפקודת איב"א – איגוד ישראלי לבקרה אוטומטית

לחיוב תקציב מוסדי שמספרו _____

רישום במקום (באמצעות המחאה או מזומן בלבד)

תאריך _____ חתימה _____

את הטופס יש לשלוח לכתובת:

מירה ארן, מזכירת איב"א

הפקולטה להנדסת חשמל

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או למייל: mira@ee.technion.ac.il

טל. לבריורים: 04-8294780 (מירה)

לידיעתך, קו 29, מתחנת הרכבת בהרצליה למלון דניאל, יוצא כל 10 דקות (זמן נסיעה כ- 15 דקות)

תודתנו נתונה למפעלים ולמוסדות

הבאים אשר תמיכתם באיב"א

מאפשרת לקיים ימי עיון מסוג זה:

אלביט מערכות בע"מ

קריה למחקר גרעיני – נגב

רפאל – מערכות לחימה מתקדמות בע"מ