

אגוד ישראל לבקרה אוטומטית - איב"א

ISRAEL ASSOCIATION for AUTOMATIC CONTROL

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הזמנה ליום עיון בנושא:

Model Predictive Control: Concepts, Algorithms, Tools, and Applications

Lecturer: Prof. Alberto Bemporad
IMT School for Advanced Studies Lucca, Italy

שייערך במלון "דניאל", הרצליה

יום ב', 5 לנובמבר, 2018

Model Predictive Control (MPC) is a well-established design technique for controlling multivariable systems subject to constraints on manipulated variables and controlled outputs in an optimized way. Following a long history of success in the process industries, in recent years MPC is rapidly expanding in several other domains, such as in the automotive and aerospace industries. This workshop will cover several aspects of model predictive control: an in-depth introduction to the basic ideas and theory behind MPC, formulations of MPC for linear, linear time-varying, hybrid, stochastic and nonlinear dynamical systems, state-of-the-art numerical algorithms for embedded optimization, and new trends in learning MPC controllers from data. A few examples of MPC based on the Model Predictive Control Toolbox for MATLAB (The Mathworks, Inc.) and the Hybrid Toolbox for MATLAB, developed by the speaker over the past 20 years, and examples of the application of MPC in industrial production will be also shown during the workshop.

We hope that you will find interest in this workshop, and look forward to seeing you with us.

Organizer: Per-Olof Gutman, Technion

Model Predictive Control: Concepts, Algorithms, Tools, and Applications

5 November 2018

Program

08:25 Registration

08:55 Opening (Moshe Idan / Per-Olof Gutman)

09:00 **Lecture 1** Basic concepts of model predictive control

10:00 **Lecture 2** Linear model predictive control

10:45 *Coffee break*

11:10 **Lecture 3** Embedded quadratic programming solvers

12:00 **Lecture 4** Multiparametric programming and explicit MPC

13:00 *Lunch break*

14:30 **Lecture 5** Hybrid dynamical systems and mixed-integer programming

15:10 **Lecture 6** Model predictive control of hybrid systems

15:50 *Coffee break*

16:10 **Lecture 7** Stochastic model predictive control

16:55 **Lecture 8** Data-driven model predictive control

17:45 **End**

About the lecturer: Alberto Bemporad received his master's degree in Electrical Engineering in 1993 and his Ph.D. in Control Engineering in 1997 from the University of Florence, Italy. In 1996/97 he was with the Center for Robotics and Automation, Department of Systems Science & Mathematics, Washington University, St. Louis. In 1997-1999 he held a postdoctoral position at the Automatic Control Laboratory, ETH Zurich, Switzerland, where he collaborated as a senior researcher until 2002. In 1999-2009 he was with the Department of Information Engineering of the University of Siena, Italy, becoming an associate professor in 2005. In 2010-2011 he was with the Department of Mechanical and Structural Engineering of the University of Trento, Italy. Since 2011 he is full professor at the IMT School for Advanced Studies Lucca, Italy, where he served as the director of the institute in 2012-2015. He spent visiting periods at Stanford University, University of Michigan, and Zhejiang University. In 2011 he cofounded ODYS S.r.l., a company specialized in developing model predictive control systems for industrial production. He has published more than 300 papers in the areas of model predictive control, hybrid systems, optimization, automotive control, and co-inventor of 10 patents. He is author or coauthor of various MATLAB toolboxes for model predictive control design, including the Model Predictive Control Toolbox (The Mathworks, Inc.), the Hybrid Toolbox, the MPCTool and MPCSoft toolboxes developed for the European Space Agency, and other MPC toolboxes tailored to industrial production. He was an Associate Editor of the IEEE Transactions on Automatic Control during 2001-2004 and Chair of the Technical Committee on Hybrid Systems of the IEEE Control Systems Society in 2002-2010. He received the IFAC High-Impact Paper Award for the 2011-14 triennial. He has been an IEEE Fellow since 2010.

יום עיון בנושא:

Model Predictive Control: Concepts, Algorithms, Tools, and Applications

שייערך במלון "דניאל", הרצליה

יום ב', 5 לנובמבר, 2018

טופס הרשמה :

שם: _____

כתובת: _____

דוא"ל: _____

מקום עבודה: _____

טלפון: _____ פקס: _____

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

רישום מוקדם עד **28.10.2018** ₪ 480

רישום החל מ- **29.10.2018** ₪ 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. לבירורים: 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 – יבשה ותקשוב בע"מ

קריה למחקר גרעיני – נגב

רפאל – מערכות לחימה מתקדמות בע"מ