IEEE, Cleveland Section

IEEE Control Systems Society Presents

2019 CACT Tutorial and Workshop on Active Disturbance Rejection Control

Organizers: Zhiqiang Gao and Lili Dong
Center for Advanced Control Technologies, Cleveland State University
1960 E. 24th Street, Cleveland, OH 44115

July 2nd, 2019, 9:00 am - 5:00 pm; Location: FH 103 (morning) WH 405 (afternoon), Cleveland State University

Registration and Opening Remarks
July 2nd, 9:00-9:30 am

Session I: Principles and Methodologies: a Tutorial
July 2nd, 10:00 am to 12:00pm
Panel: Drs. Wenchao Xue, Wen Tan, Sally Shao, Zhiqiang Gao

Description: There are three parts to this sessions: 1) a critical reflection on the foundation of automatic control and the exposition of the history and principles of a different paradigm, symbolized by ADRC; 2) the methods of estimating internal and external disturbances, with or without a model of the physical process; 3) the impacts of ADRC in asking a different set of questions in research and in creating a disruptive technology in industrial control.

Session II: Technologies and Applications
July 2nd, 1:00 pm to 3:00pm
Panel: Drs Lili Dong, Xiangyang Li, Li Sun, Qinling Zheng

Description: ADRC as originally proposed by J. Han has three components: tracking differentiator, nonlinear feedback control, and nonlinear extended state observer. The combination of the three proves to be a powerful tool for disturbance rejection control. As an industrial control technology, however, it has been streamlined, simplified and parameterized so that it can be easily deployed across various hardware-software platforms and easily tuned by factory personnel, leading to explosive growth in its applications that transcend engineering disciplines. In this session we show how this is accomplished and how an advanced principle is married into a domain of engineering applications that often leads to an order of magnitude improvement. Most importantly, it will be shown that the key in application of ADRC is the reformulation of the control problem as that of disturbance rejection, as shown in applications in several key technology areas such as internal combustion, power generation, space applications, aeronautics, process control, and high energy physics.

Session III: Current and Future Work
July 2nd, 3:00 pm to 5:00pm

This session will see engineers and graduate students presenting their latest research, including preliminary findings and unresolved issues. Also presented is the outlook on future development of ADRC.

RSVP or additional information: Dr. Lili Dong, L.Dong34@csuohio.edu, or 216-687-5312

CPD: One credit available for each hour of presentation seat time (Maximum of 7 hours available). Bring your flyer for credit.

This is to certify that _____ attended this workshop and earned ___ CPD hours. Certified by _____.
Certificates of attendance and other evidence of CPD activity should be retained by the attendee for auditing purposes.