

The 32nd Chinese Control and Decision Conference

GENERAL INFORMATION

Chinese Control and Decision Conference (CCDC) is an annual international conference and has been held successfully for 31 years. The 32nd Chinese Control and Decision Conference (CCDC 2020) was successfully held virtually during 22-24 August. CCDC 2020 was co-organized by Northeastern University, China and Technical Committee on Control and Decision of Cyber Physical Systems (TCCD-CPS), Chinese Association of Automation, China. The local organizer was Anhui University, China. The conference was technically co-sponsored by IEEE Control Systems Society (CSS), Technical Committee on Control Theory of Chinese Association of Automation and State Key Laboratory of Synthetical Automation for Process Industries, China.

TECHNICAL PROGRAM



Figure 1 CloudVenue of CCDC 2020

The CCDC 2020 received 1306 full paper submissions. After going through a rigorous reviewing process during which all the members in the Technical Program Committee worked professionally, timely, responsibly and diligently, 1003 papers were accepted for presentation in 98 oral sessions and 9 interactive sessions in the conference. 1536 delegates attended the virtual conference.



Figure 2 Professor Guang-Hong Yang, the General Chair of CCDC 2020, chairing the ceremony



Figure 3 Professor Qunjing Wang delivering a welcome address on behalf of the Local Organizer of CCDC



Figure 4. Professor Fuli Wang, Chair of Organizing Committee, delivering an opening address



Figure 5 Professor Changyun Wen, Chair of International Technical Program Committee, delivering an address online



Figure 6 Professor Anuradha Annaswamy delivering a congratulation address online

In addition to the normal technical sessions, the technical program also included 4 keynote addresses, 7 distinguished lectures and 4 forums covering the state-of-the-art in both theory and applications in control, decision, automation, robotics and emerging technologies, as well as young talents cultivation. The 4 keynotes were as follows:

1. “*Control and Optimization for Integration of Renewables*” by Professor Anuradha Annaswamy, Massachusetts Institute of Technology, USA;
2. “*Systems and Control Theory for Advanced Manufacturing*”, Presented by Professor Richard D. Braatz, Massachusetts Institute of Technology, USA;
3. “*Digital Retina: A System Framework to Improve Cloud Vision Computing to Brain Like Vision Computing*” by Professor Wen Gao, Peking University, China;
4. “*Control Theory of Switches and Clocks*” by Professor Rodolphe Sepulchre, University of Cambridge, UK.

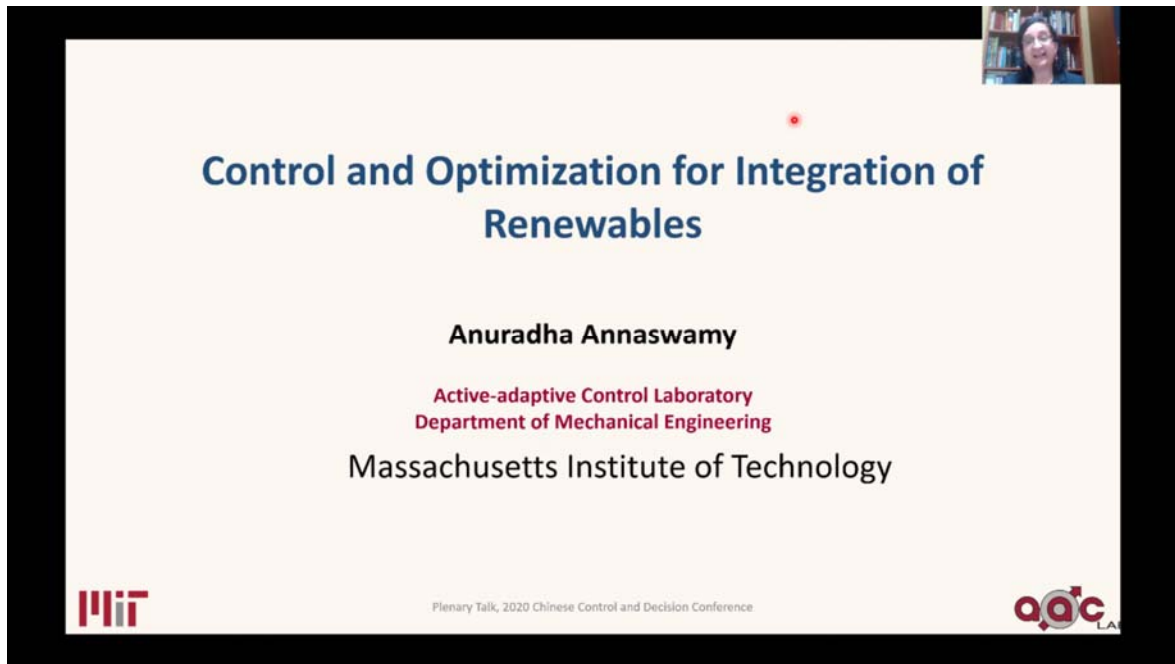


Figure 7 Professor Anuradha Annaswamy delivering her keynote address



Figure 8. Professor Richard D. Braatz delivering his keynote address

 **北京大学数字媒体研究所**
INSTITUTE OF DIGITAL MEDIA, PEKING UNIVERSITY

 **鹏城实验室**
PENGCHENG LABORATORY

Digital Retina – A System Framework for Improving Cloud Vision System to Brain-like Vision System

Wen Gao (高文)
Peking University (北京大学), and
PengCheng Lab (鹏城实验室)



Figure 9. Professor Wen Gao delivering his keynote address



Figure 10 Professor Rodolphe Sepulchre delivering his keynote address

Distinguished lectures were delivered by Professor Jun Fu of Northeastern University on “*Dynamic Optimization and Control of Nonlinear Systems*”, Professor Guoqiang Hu of Nanyang Technological University on “*Gradient-Free Distributed Optimization and Nash Equilibrium Seeking for a Multi-Agent System with Unknown Cost Function*”, Professor Hamid Reza Karimi of Politecnico di Milano on “*Multiactuation Schemes and Information Constraints for Vibration Control of Large-Scale Systems*”, Professor Rajesh

Rajamani of University of Minnesota on “*Interesting Problems in Estimation and Control on Smart Road Vehicles*”, Professor Xin Xin of Okayama Prefectural University on “*Control Design and Analysis for Underactuated Robotic Systems*”, Professor Rong Su of Nanyang Technological University on “*About Cyber Security in Discrete-Event Dynamic Systems: from Modelling and Analysis of Smart Attacks to Attack-Resilient Supervisory Control*”, Professor Qianchuan Zhao of Tsinghua University on “*On Intelligent Decision Framework for Smart Buildings*”.



Figure 11 Professor Jun Fu delivering his distinguished lecture



Figure 12 Professor Hamid Reza Karimi delivering his distinguished lecture



Figure 13 Professor Guoqiang Hu delivering his distinguished lecture

Rear Target Detection

Clustering from Scan Data for Car Detection

- At the end of each scan, use density-based clustering algorithm
- Also examine sizes of clusters to identify objects.

Original data

Y-axis: Lateral position Y[m]
X-axis: Longitudinal position X[m]

From Clustering

* Colors represents each scan

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Figure 14 Professor Rajesh Rajamani delivering his distinguished lecture



Figure 15 Professor Xin Xin delivering his distinguished lecture

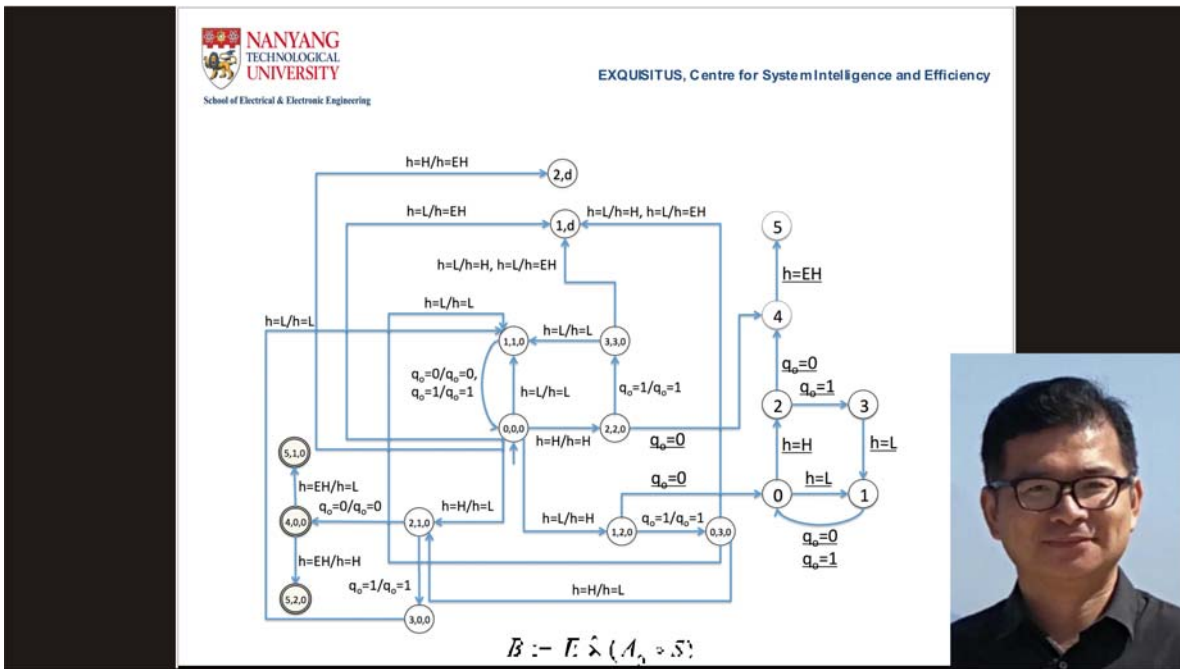


Figure 16 Professor Rong Su delivering his distinguished lecture

正在讲话: 赵千川

腾讯会议

studies: Comparison with other methods

Case	Method	PUMP-A		PUMP-A		PUMP-A		PUMP-A		PUMP-B		PUMP-B		Δ (L/s)	P^* (KW)
		ω_1	Q_1	ω_2	Q_2	ω_3	Q_3	ω_4	Q_4	ω_5	Q_5	ω_6	Q_6		
Case 1 $Q_0 = 86$	BRS	0.7340	43.476	0.7304	42.524	0	0	0	0	0	0	0	0	0	25.378
	SC	0.7199	39.623	0	0	0	0	0	0	0.9	46.377	0	0	0	32.970
	SLSQP	0.7322	42.995	0.7322	42.995	0	0	0	0	0	0	0	0	-0.01	25.377
	GA	0.8046	59.632	0	0	0	0	0	0	0.7528	26.342	0	0	0.026	26.902
	TA	0.7354	43.831	0	0	0	0	0	0	0.7269	21.296	0.7269	21.296	0.423	27.288
Case 2 $Q_0 = 117$	BRS	0.8285	58.509	0.8284	58.491	0	0	0	0	0	0	0	0	0	38.757
	SC	0.9066	74.038	0	0	0	0	0	0	0.9	42.962	0	0	0	45.697
	SLSQP	0.8285	58.509	0.8285	58.509	0	0	0	0	0	0	0	0	0.018	38.764
	GA	0.7835	48.045	0.8798	68.960	0	0	0	0	0	0	0	0	-0.005	39.539
	TA	0.7790	46.901	0.7803	47.255	0	0	0	0	0.7710	23.201	0	0	0.357	39.614
Case 3 $Q_0 = 248$	BRS	0.9051	61.208	0.9111	62.552	0.9076	61.775	0.9107	62.465	0	0	0	0	0	101.322
	SC	0.9	60.036	0.9	60.036	0.9046	61.098	0	0	0.9	33.415	0.9	33.415	0	33.415
	SLSQP	0.9086	61.991	0.9086	61.991	0.9086	61.991	0.9086	61.991	0	0	0	0	0	0
	GA	0.9516	71.161	0.8425	45.289	0.9798	76.739	0.8780	54.792	0	0	0	0	0	0
	TA	0.8833	56.087	0.8762	54.349	0.8762	54.349	0.8832	56.076	0.8665	27.381	0	0	0	0
Case 4 $Q_0 = 288$	BRS	0.9264	60.082	0.9417	63.626	0.9597	67.610	0.9667	69.121	0.8972	27.561	0	0	0	29.561
	SC	0.9	53.510	0.9	53.510	0.9	53.510	0.9	53.510	1.0	44.156	0.9086	29.561	0	29.561
	SLSQP	0.9742	70.722	0.9742	70.722	0.9742	70.722	0.9742	70.722	0.8402	5.106	0	0	0	0
	GA	0.9497	65.410	0.8780	47.457	0.9587	67.390	0.9593	67.523	0.9717	40.189	0	0	0	0
	TA	0.9193	58.378	0.9193	58.378	0.9193	58.378	0.9120	56.568	0.9018	28.494	0.8973	27.381	0	0

*BRS is our insect intelligent building APP




Figure 17 Professor Qianchuan Zhao delivering his distinguished lecture

Forums were organized and chaired by Professor Jianchang Liu of Northeastern University on “Forum on ‘Three-Comprehensive’ Talent Cultivation in Automation”, Professor Ge Yu of Northeastern University on “Blockchain Frontier Technology Forum”, Professor Qiuye Sun of Northeastern University on “Outstanding Doctors Forum-AI-Driven Automation”, Wei Zhang of Northeastern University on “Forum on Young Scholar Development”.

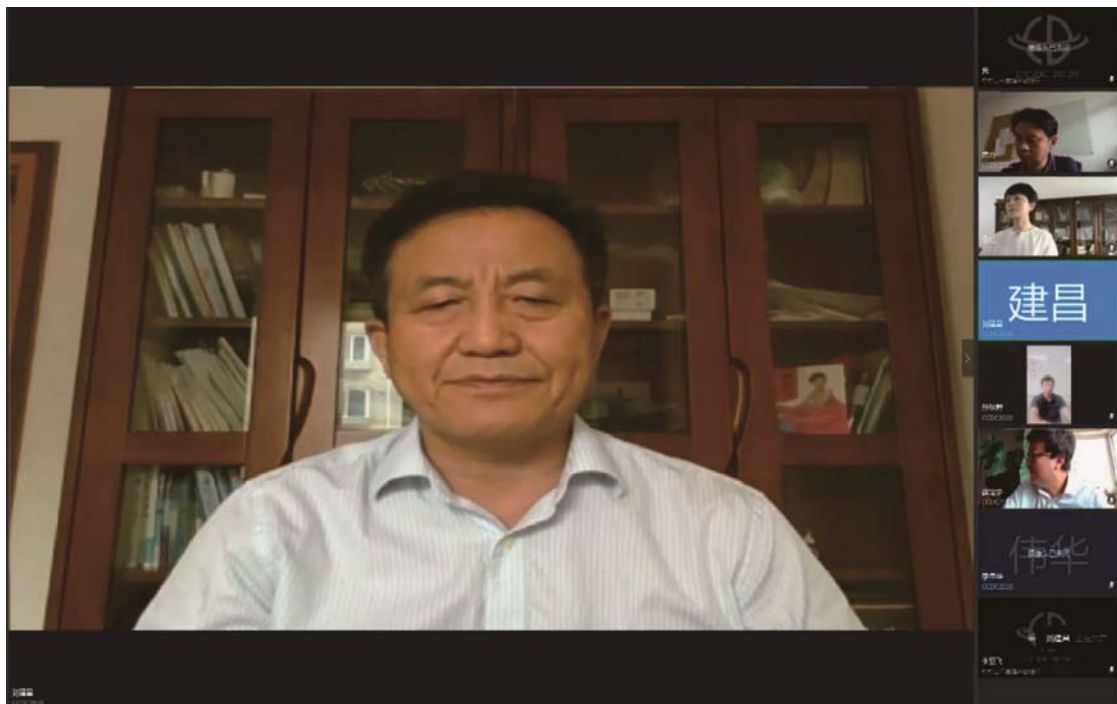


Figure 18 Forum on "Three-Comprehensive" Talent Cultivation in Automation



Figure 19 Outstanding Doctors Forum-AI-Driven Automation



Figure 20 Blockchain Frontier Technology Forum



Figure 21 Wei Zhang of Northeastern University chairing the Forum on Young Scholar Development

All sessions, including keynote address sessions, distinguished lecture sessions, forum sessions, oral sessions and interactive sessions, were well attended and produced active discussions.

The USB flash disk, containing all the papers presented at the conference, will be expressed to each registered delegate and also can be downloaded from the official website. The papers written in English of official conference proceedings have been published by IEEE and included in the IEEE Xplore Database.

AWARD CEREMONY

The award ceremony of the "Zhang Si-Ying (CCDC) Outstanding Youth Paper Award" and "2019 Chinese Journal of Control and Decision Outstanding Paper Award" were held in the evening of 23 August, 2020.



Figure 22 The CCDC 2020 Award Committee assessing the oral presentations of the four finalists



Figure 23 "Zhang Si-Ying(CCDC) Outstanding Youth Paper Award"



Figure 24 Winners of the 2019 Chinese Journal of Control and Decision Outstanding Paper Award

The Zhang Si-Ying (CCDC) Outstanding Youth Paper Award serves to recognize Academician Zhang Si-Ying’s highly-regarded perseverance, character and academic contribution. It also serves to inspire, motivate and encourage young scholars in their research. For a paper to be eligible for the award, the first author of the paper must not be older than 35 on the day of award presentation at the conference. The Zhang Si-Ying (CCDC) Outstanding Youth Paper Award winner receives an award of 10,000 CNY together with a certificate, each of the remaining finalists receives an award of 3,000 CNY and the Certificate of Finalist. The Award Committee for the CCDC 2020 was composed of five members: Professor Anuradha Annaswamy of USA, Professor Jun Fu of China, Professor Zhong-Ping Jiang of USA, Professor Changyun Wen of Singapore and Professor Guang-Hong Yang of China. For the CCDC 2020, 119 papers were selected for consideration for the “Zhang Si-Ying Outstanding Youth Paper Award” based on reviewers’ comments, nominations, and the evaluations of the Technical Program Committee members. These papers were sent to famous experts including some members of the International Advisory Committee for further evaluation. Based on the evaluations and recommendation, the Technical Program Committee shortlisted the following four papers as the finalists for the Award:

1. “*Real-time Optimal Power Allocation for Smart Grid System via Deep Neural Network: A Learning Based Approach*” by Fanghong Guo, Bowen Xu, Wen-An Zhang, Dan Zhang and Li Yu of Zhejiang University of Technology;
2. “*Distributed Frequency Controller for MT-HVDC Systems Via Adaptive Dynamic Programming*” by Zhongjie Hu, Zhi-Wei Liu, Xiong Hu and Ming Chi of Huazhong University of Science and Technology;
3. “*Spectral Analysis of Network Coupling on Power System Synchronization with Varying Phases and Voltages*” by Peng Yang, Feng Liu, Zhaojian Wang, Shiyong Wu and Hangyin Mao of Tsinghua University;

4. “*Analytic Hierarchy Process (AHP) in Portfolio Selection Based on Information Granularity*” by Kaixin Zhao, Yaping Dai, Ye Ji and Jiayi Sun of Beijing Institute of Technology.

During the conference, all the Award Committee members attended the oral presentations of the 4 finalist papers. Each member independently assessed their originality, technical quality and written and oral presentations. On the basis of these assessments, Paper 3 listed above won the CCDC 2020 Zhang Si-Ying Outstanding Youth Paper Award. Professor Guang-Hong Yang introduced the award selection criteria and process, presented online the awards with certificates to all the finalists and the winner in the presentation ceremony.

All the papers published in Chinese Journal of Control and Decision from 2017 to 2018 were sent to distinguished experts in the relevant areas for evaluations for the 2019 Outstanding Paper Award of the journal. Based on their comments and recommendations, 4 papers, respectively authored by Haiyan Chen of Nanjing University of Aeronautics and Astronautics, Xiongwei Zhou of Central South University, Xiaoming You of Shanghai University of Engineering Science and Jingming Yang of Yanshan University, won the Award.

The 33rd CHINESE CONTROL AND DECISION CONFERENCE

The 33rd Chinese Control and Decision Conference (CCDC 2021) will be held in Kunming, China, during 22-24 May, 2021. Keynote addresses on the state-of-the-art of the theories and applications in control and decision will be delivered by Professor Thomas Parisini of Imperial College London, UK, Professor Xiaohong Guan of Xi’an Jiaotong University, China and Professor Guangren Duan, Harbin Institute of Technology, China. The Organizing Committee will invite additional prominent professors/academicians as speakers of keynotes and distinguished lectures for the CCDC 2021. Information for the CCDC 2021 will consistently be updated on the conference website: <http://www.ccdc.neu.edu.cn>.

International Technical Program Chairs

Changyun Wen,
Zhong-Ping Jiang