**Title of the invited session**

Data-driven Optimization and Control in Dynamic Environments

**Justification**

Data driven approaches have been proved to be very powerful for optimization and control in complex dynamic environments, such as the process industry, the intelligent power grids, the aeronautics and astronautics, the traffic and communication networks. In recent years, different kinds of data-driven approaches have been proposed and widely applied. One direction in the data-driven research is to combine the data-driven approaches with the computational intelligence methods including the neural networks, fuzzy logics, and evolutionary algorithms to enhance the learning ability and the inference capability. Moreover, the development of deep neural networks is a great success and inspiration for data-driven research domain.

Though great progress has been made in the theoretical research and applications of the computational intelligence based data-driven approaches these years, many open issues and challenges still need to be studied. The aim of this special session is to call for the most advanced research and state-of-the-art works in the field of data-driven optimization and control in dynamic environments. It is expected to provide a platform for international researchers to exchange ideas and to present their latest research in the relevant topics. Specific topics of interest include but are not limited to:

* + Data-driven neural-fuzzy modeling, prediction and control
  + Data-driven evolutionary optimization and control
  + Adaptive dynamic programming and reinforcement learning systems
  + Multi-agent reinforcement learning for optimization and control
  + Deep reinforcement learning
  + Applications in realistic and complicated systems

**Short bio of the proposers together with contact email addresses**

**Bin Wang** received the Ph.D. degree in control theory and control engineering from the Institute of Automation, Chinese Academy of Sciences, Beijing, China, in 2015. He is currently a lecturer at the School of Automation and Electrical Engineering, University of Jinan, Jinan, China. His major research interests include robotics, reinforcement learning, adaptive dynamic programming and neural networks.

**Zhen Zhang** received the Ph.D. degree from the Institute of Automation, Chinese Academy of Sciences, Beijing, in 2013. Since 2013, he has been a Lecturer with the College of Automation and Electrical Engineering, Qingdao University, Qingdao, China. His current research interests include reinforcement learning, multi-agent learning and neural networks.

**Chengdong Li** received the Ph.D. degree from the Institute of Automation, Chinese Academy of Sciences, Beijing, China, in 2010. He is currently an associate professor with the School of Information and Electrical Engineering, Shandong Jianzhu University. His major research interests include data-driven modeling and control, fuzzy logic theory and applications, fuzzy neural networks and other computational intelligence methods. His research interests also include the intelligent control methods with applications to intelligent buildings and smart homes. He has authored and co-authored over 80 papers in international journals and conferences. He has been the Program Committee Member of several international conferences and the Reviewer for several international conferences and journals.

**Dongbin Zhao** received the B.S., M.S., Ph.D. degrees from Harbin Institute of Technology, Harbin, China, in 1994, 1996, and 2000 respectively. He was a postdoctoral fellow at Tsinghua University, Beijing, China, from 2000 to 2002. He has been a professor at Institute of Automation, Chinese Academy of Sciences since 2002, and also a professor with the University of Chinese Academy of Sciences, China. From 2007 to 2008, he was also a visiting scholar at the University of Arizona. He has published 4 books, and over 60 international journal papers. His current research interests are in the area of computational intelligence, adaptive dynamic programming, deep reinforcement learning, robotics, intelligent transportation systems, and smart grids.

Dr. Zhao is the Associate Editor of *IEEE Transactions on Neural Networks and Learning Systems* (2012-), *IEEE Computation Intelligence Magazine* (2014-), etc. He is the Chair of Beijing Chapter, and was the Chair of *Adaptive Dynamic Programming and Reinforcement Learning Technical Committee* (2015-2016)*, Multimedia Subcommittee* (2015-2016) of IEEE Computational Intelligence Society (CIS). He works as several guest editors of renowned international journals. He is involved in organizing several international conferences.

**Contact Information**

**Name:** **Bin Wang**

**Email address:** [cse\_wangb@ujn.edu.cn](mailto:cse_wangb@ujn.edu.cn)

**Affiliation:**University of Jinan

**Telephone number:**+86 15253199217

**Name: Zhen Zhang**

**Email address:** [tbsunshine8@163.com](mailto:chengdong.li@foxmail.com)

**Affiliation:**Qingdao University

**Telephone number:** +86 15192561339

**Name:** **Chengdong Li**

**Email address:** [chengdong.li@foxmail.com](mailto:chengdong.li@foxmail.com)

**Affiliation:**Shandong Jianzhu University

**Telephone number:** +86 18866410727

**Name:** **Dongbin Zhao**

**Email address:**[dongbin.zhao@ia.ac.cn](mailto:dongbin.zhao@ia.ac.cn)

**Affiliation:**Institute of Automation, Chinese Academy of Sciences

**Telephone number:**+86 010-82544764

**List of potential contributors**

|  |  |  |
| --- | --- | --- |
|  | **Name** | **Affiliation** |
| 1 | Ruizhuo Song | University of Science and technology Beijing |
| 2 | Haibo He | University of Rhode Island |
| 3 | Jianqiang Yi | Institute of Automation, Chinese Academy of Sciences |
| 4 | Huidong Wang | Shandong University of Finance and Economics |
| 5 | Yuanheng Zhu | Institute of Automation, Chinese Academy of Sciences |
| 6 | Chengdong Li | Shandong Jianzhu University |
| 7 | Zhen Zhang | Qingdao University |
| 8 | |  |  | | --- | --- | | |  | | --- | |  | |   Bin Wang | University of Jinan |
| 9 | Dongbin Zhao | Institute of Automation, Chinese Academy of Sciences |