

Title: Data-driven/Data-based Adaptive Dynamic Programming for Uncertain Nonlinear Systems

Aim: Recently, data-driven/data-based reinforcement learning(RL) and adaptive dynamic programming(ADP) theories and designs have been investigated widely, including off-policy reinforcement learning, robust adaptive dynamic programming, game theory-adaptive dynamic programming and so on. The collected system data is required instead of the accurate knowledge of system dynamics for the data-driven methods which can be considered as model-free ADP/RL schemes. Many practical systems such as power systems, robot manipulators, etc. usually include the uncertainty due to the existence of parametric uncertainty, exogenous disturbance, plant uncertainty and so on. Therefore, it is difficult to build an accurate system model for uncertain nonlinear systems. The data-driven methods can address effectively the issue for the optimal control of uncertain nonlinear systems. The special session will also enhance the discussion among different communities to explore more challenge cross-discipline topics along this direction.

Scope and Topics:

This special session will provide a forum to deliver and discuss original research results and new techniques in data-driven/data-based ADP for uncertain nonlinear systems. We are particularly interested in the following topics:

- Data-driven/data-based ADP for uncertain nonlinear systems
- Data-driven/data-based robust ADP based on optimal control
- Data-driven/data-based ADP based on game theory
- Data-driven/data-based policy gradient method for complex systems
- data-driven/data-based ADP based event-triggered methods

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- Off-policy RL design for nonlinear systems with disturbances
 - Power systems stability based on data-driven/data-based ADP
 - Robot control systems based on data-driven/data-based ADP
 - Optimal control based on big data
 - Deep reinforcement learning in automatic driving

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Important Dates:

<http://www.ele.uri.edu/ieee-ssci2017/ImportantDates.htm>

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