

**Lecture by**

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**Workflow Scheduling in Cloud Control Systems (面向云控制系统的工作流调度)**

With the development of cloud computing, more and more workflow applications have been migrated to the cloud. Workflows scheduling becomes a challenging issue for meeting various quality of service (QoS) constraints due to the large scale of workflows and elasticity and heterogeneity of cloud resources. In this talk, we will present our recent works on workflows scheduling in cloud control systems. Firstly, we propose a Scoring and Dynamic Hierarchy-based NSGA-II (Nondominated Sorting Genetic Algorithm II) to minimize both makespan and cost of workflow execution and design a Multi-swarm Co-evolutionary-based Hybrid Optimization (MCHO) algorithm for multiple-workflow scheduling to minimize total makespan and cost while workflow deadline constraints. Then, we introduce some workflow scheduling strategies which is based on the intelligent optimization algorithm for solving constrained optimization workflow scheduling problems in cloud control systems. Furthermore, we focus on the workflows dynamic scheduling problem and design the multi-workflows scheduling algorithms with uncertainty in clouds to minimize total cost and improve cloud resource utilization. Finally, a cloud workflow management platform which can manage cloud workflows efficiently is developed to support the implementation of scheduling algorithms and the application of workflow scheduling in cloud control systems is introduced with the workflow management platform.



Yuanqing Xia is a chair professor and doctoral supervisor at Beijing Institute of Technology. He is now the dean of School of Automation, Beijing Institute of Technology. In 2012, he obtained the National Science Foundation for Distinguished Young Scholars of China, and in 2016, he was honored as the Yangtze River Scholar Distinguished Professor and was supported by National High Level Talents Special Support Plan ("Million People Plan") by the Organization Department of the CPC Central Committee. In 2017, he was approved to enjoy the special government allowances of the State Council.

His current research interests are in the fields of networked control systems, robust control and signal processing, active disturbance rejection control, flight control and cloud control. He has published eight monographs in Springer and John Wiley, and more than 200 papers in journals. He is an Editor in deputy of the Journal of the Beijing Institute of Technology, Associate Editor of Acta Automatica Sinica, Control Theory and Applications, International Journal of Innovative Computing, Information and Control, International Journal of Automation and Computing. He is currently the director of specialized committee on cloud control and decision of Chinese Institute of Command and Control (CICC), the vice chairman of China Internet of Things Working Committee, the director of the ninth Council of the Systems Engineering Society of China, and the director of the first Council of CICC.