



Discrete Dynamics in Nature and Society

Special Issue on **Intelligent Control in Discrete-Time for Autonomous Systems**

CALL FOR PAPERS

The application of automatic systems is playing an increasingly important role in our modern society. For example, millions of autonomous robots are impacting our daily life by working on assembly lines and construction sites and even in our homes. The soul of an autonomous system lies in its controller, which nowadays is typically implemented by computers in discrete-time: measurements are made and control actions are taken at discrete time instants, seconds, minutes, hours, or days apart. Conventionally, both mathematical models of physical systems and controllers are developed in continuous-time, and then digitalization is applied on controller.

It is now more popular to identify discrete-time models and use them to design discrete-time control, because the input output data under digital measurement is generally only available at discrete time instants. The control design in discrete-time is much more challenging than in continuous-time, due to the lack of counterpart mathematical tools. In addition, the next generation of autonomous systems is required to perform tasks with smart and flexible strategic decisions, for example, unmanned vehicles on the road, automatic cleaner at homes, multiple robots, or human-robot in collaboration. To meet these requirements, more intelligence must be brought into the control strategies, rather than conventional control design focusing on stability and robustness. Artificial intelligence technologies, especially the bioinspired technologies, should be investigated in the intelligent control design in discrete-time.

The main goal of this special issue is to address original research articles in autonomous discrete-time systems with intelligent controller. The main aim is to publish recent advances relevant to advanced control design for discrete-time systems and their implementation in autonomous systems such as service robots and unmanned vehicles, which are becoming more and more popular in industry and in our life. Particular problems need to be addressed to cope with the various uncertainties, to guarantee the safety, to improve the efficiency, and so on. In addition, this special issue also welcomes research articles on discrete dynamics modelling and investigation of biosystems, which could result in biomimetic algorithms that potentially enhance the intelligence of artificial autonomous system. Generally, we invite researchers to contribute their review and original research articles.

Potential topics include, but are not limited to:

- ▶ Sliding mode based discrete-time control
- ▶ Hybrid control of discrete-time systems
- ▶ Control of sampled-data systems with uncertainties
- ▶ Discrete-time filter and estimator and their applications
- ▶ Decision making and control design in discrete-time
- ▶ Discrete-time autopilot of marine vehicles and unmanned cars
- ▶ Discrete-time control of smart robots
- ▶ Human-robot interactions with discrete-time adaptation
- ▶ Multiagent systems coordinated by discrete-time control
- ▶ Discrete-time modeling and identification of biosystems
- ▶ Biomimetic control of discrete-time systems

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/ddns/icda/>.

Lead Guest Editor

Chenguang Yang, Plymouth University,
Plymouth, UK
chenguang.yang@plymouth.ac.uk

Guest Editors

Bin Xu, Northwestern Polytechnical
University, Xi'an, China
binxu@nwpu.edu.cn

Hongbin Ma, Beijing Institute of
Technology, Beijing, China
mathmhb@bit.edu.cn

Deqing Huang, Imperial College
London, London, UK
elehd2012@gmail.com

Jing Na, Bristol University, Bristol, UK
najing25@163.com

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