

Special Issue on **Advanced Mathematical Methods for Collaborative Robotics**

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Nowadays, humans and robots are not able to share the same workspace in industrial applications and, hence, tasks are performed by humans or robots depending on the required dexterity and repeatability. But the new trend in industry for the next years is that humans and robots work hand in hand, where humans could increase production flexibility and accelerate adaptation, while robots could contribute to speed-up production and increase repeatability and quality.

The main feature of human-robot collaboration is that there will be no physical separation between humans and robots and they will work in the same workstations, with no safety fencing. To accomplish this, manufacturers are currently releasing a new generation of robots specially designed for coworking and equipped with multiple sensors: force and torque sensors, vision systems, and so forth.

From the scientific point of view, this framework represents a new challenging engineering scenario for the researchers in order to develop new advanced mathematical algorithms and methods to provide the robot with the level of intelligence required to successfully accomplish the complex collaborative tasks.

This special issue is a good opportunity to contribute to this new exciting field. In particular, the issue is focused on advanced methods with strong theoretical and mathematical foundations for the engineering problem of collaborative robotics. The articles published in this theme could have a high impact on readers.

Potential topics include but are not limited to the following:

- ▶ Mathematical tools for the engineering problem of human-robot collaboration
- ▶ Mathematical methods for robot coworking and bimanual manipulation
- ▶ Control theory for collaborative robotics: sliding mode control, nonlinear control, robust control, fuzzy control, and so forth
- ▶ Formulations of expert systems for collaborative robotics
- ▶ Mathematical algorithms for robot learning
- ▶ Artificial intelligence for collaborative robots
- ▶ Advanced algorithms for force control of collaborative robots
- ▶ Mathematical methods for big data and sensor fusion in collaborative robotics

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Papers are published upon acceptance, regardless of the Special Issue publication date.

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Submission Deadline

Friday, 23 March 2018

Publication Date

August 2018