ARCAI 2024 Special Session "Modeling, estimation and control for robot systems"

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Call for Papers:

Various new developments on robots' related theory and applications have drawn many attentions. The robots for high-precision industrial control, narrow space operation, smart elderly care, and material handling, etc., require a more precious, flexible and intelligent motion control performance. Especially, in an unstructured environment, it requires the comprehensive advances on the modeling, estimation and control theory or techniques. For example, a high-precision and high-efficiency dynamic model can benefit the control precision. Moreover, advanced control method such as that with adaptive or learning algorithm, new development on sensing device such as 3D touch sensor, etc., will both provide more possibilities on the robots' practical applications. In addition, the latest control requirements for robots under state constraints, settling time pre-definition, and control input saturation, etc., will raise new challenges for the researchers and engineers either. Therefore, it is imperative to explore developments of modeling, estimation and control methods for complex robotic systems by integrating relevant knowledge from various disciplines such as mathematics, mechanics, automation, informatics, and computer science, etc.

This special session aims to communicating about the latest advances on robot modeling, estimation and control methods and their applications. Researchers in related fields are invited to present the above problems in complex situations and explore major research challenges and development opportunities in this emerging area.

Authors are encouraged to submit their original contributions demonstrating the application of various types of advanced modeling, estimation and control to complex robotic systems. Potential topics include, but not limited to the following:

- Kinematic and dynamic models
- Control theory and application
- System identification and estimation
- Multi-sensor fusion
- Motion planning
- Simultaneous localization and mapping (SLAM)
- Navigation, guidance and control
- New types of robots

Accepted and presented papers will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements and indexed by EI Compendex and Scopus. Selected papers will be invited to SCI Journal Special Issues.