



## *The 16th International Conference on Intelligent Robotics and Applications (ICIRA 2023)*

*July 5-7, 2023 in Hangzhou, China*

### **ICIRA 2023 Special Session Proposal**

#### **Title of the Proposal: Robotic machining of complex components**

#### **Technical Outline of the Session and Topics:**

Due to the great advantages of large operation space, high flexibility and low cost compared with CNC machine tools, industrial robots are more and more widely used in the manufacturing of complex curved components, such as robotic milling, grinding and deburring of aerospace parts. However, the weak rigidness and low positioning accuracy of robots restricts the final accuracy and surface quality of robotic machining. Recent innovations in robotic measurement, rigid-flexible dynamics modelling, force-control, tool path optimization and error compensation studies have promising results to improve the accuracy and quality of robotic machining. In this session, we are inviting submissions and reports on new methods and approaches towards higher performance of robotic machining.

#### **Topics of the Session:**

- *Dynamics modelling of robotic machining system and its application in process optimization*
- *Robotic measurement and the point-cloud data analysis*
- *High stability force control in compliant grinding to guarantee the surface quality of curved parts*
- *Tool path smoothing and feedrate optimization to improve the motion stability and efficiency of robot*
- *Error prediction and compensation/control to improve the path accuracy of robotic machining*
- *Chatter identification and suppression to improve the surface quality in robotic milling of thin-walled parts*
- *Machine learning technologies to enhance the modelling accuracy and efficiency of robotic machining system in large workspace*
- *New technologies of robot design to enhance performance of robotic machining*

#### **Contact details of the Session Organizers**

- *Organizer 1: Jixiang Yang, Huazhong University of Science and Technology, [jixiangyang@hust.edu.cn](mailto:jixiangyang@hust.edu.cn)*
- *Organizer 2: Zhoulong Li, Shanghai Jiao Tong University, [lzl@sjtu.edu.cn](mailto:lzl@sjtu.edu.cn)*

- *Organizer 3: Xingwei Zhao, Huazhong University of Science and Technology, zhaoxingwei@hust.edu.cn*