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Research on Robot Adaptive Polishing Control Technology

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Abstract : Manual polishing has problems such as high labor intensity, low production efficiency and difficulty in guaranteeing the consistency of polishing quality. It is more and more necessary to replace manual polishing with robot polishing. Polishing force directly affects the quality of polishing, so accurate tracking and control of polishing force is one of the most important conditions for improving the accuracy of robot polishing. The traditional force control strategy is difficult to adapt to the strong coupling of force control and position control during the robot polishing process. Therefore, based on the analysis of force-based impedance control and position-based impedance control, this paper proposed a new type of adaptive controller. Based on force feedback control of active compliance control, the controller can adaptively estimate the stiffness and position of the external environment and eliminate the steady-state force error produced by traditional impedance control. The simulation results of the model shows that the adaptive controller has good adaptability to changing environmental positions and environmental stiffness, and can accurately track and control polishing force.

Keywords : robot polishing, force feedback, impedance control, adaptive control
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