

可重构机械臂分散自适应模糊滑模控制

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**摘要** 为了适应软件模块化的设计观念, 提出一种可重构机械臂的分散自适应模糊滑模控制方案, 把可重构机械臂的动力学描述为一个交联子系统的集合。使用模糊逻辑系统逼近子系统动力学模型, 然后设计自适应滑模控制器抵消交联项和模糊逼近误差对轨迹跟踪性能的影响。这些子系统控制器组成一个模块化的控制网络, 协调工作实现可重构机械臂稳定可靠的运动。最后, 仿真结果证明了提出的分散控制方案的有效性。

**关键词** [自动控制技术](#) [可重构机械臂](#) [分散控制](#) [模糊控制](#) [滑模控制](#)

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Decentralized adaptive sliding mode control for reconfigurable manipulators using fuzzy logic

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**Abstract** For reconfigurable manipulators, it is very difficult to design effective controllers due to diverse configurations. To satisfy the concept of modular software design, a decentralized adaptive fuzzy sliding mode control scheme for the reconfigurable manipulators was proposed. The dynamics of the manipulators was represented as a set of interconnected subsystems. Then fuzzy logic system was used to approximate the unknown dynamics of the subsystem, and a sliding mode controller with an adaptive scheme was designed to avoid both interconnection term and fuzzy approximation error. These subsystem controllers constitute a modular control network to achieve stable and reliable motion of a reconfigurable manipulator. Simulation results show the validity of the proposed decentralized control scheme.

**Key words** [automatic control technology](#) [reconfigurable manipulators](#) [decentralized control](#) [fuzzy control](#) [sliding mode control](#)

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