Neuro-fuzzy control of industrial systems with actuator nonlinearities

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Abstrak

Neural networks and fuzzy systems are model free control design approaches that represent an advantage over classical control when dealing with complicated nonlinear actuator dynamics. Neuro-Fuzzy Control of Industrial Systems with Actuator Nonlinearities brings neural networks and fuzzy logic together with dynamical control systems. Each chapter presents powerful control approaches for the design of intelligent controllers to compensate for actuator nonlinearities such as time delay, friction, deadzone, and backlash that can be found in all industrial motion systems, plus a thorough development, rigorous stability proofs, and simulation examples for each design. In the final chapter, the authors develop a framework to implement intelligent control schemes on actual systems.
Rigorous stability proofs are further verified by computer simulations, and appendices contain the computer code needed to build intelligent controllers for real-time applications. Neural networks capture the parallel processing and learning capabilities of biological nervous systems, and fuzzy logic captures the decision-making capabilities of human linguistics and cognitive systems.