

Special Issue

Precision Machining Optimization: Fuzzy Logic and Adaptive Control

Message from the Guest Editors

Precision machining is vital in aerospace, optics, semiconductors, biomedical devices, and ultra-precision instrumentation. Yet growing demands for accuracy and efficiency face challenges from nonlinear dynamics, uncertainties, and disturbances due to tool wear, material variations, thermal effects, and environmental changes. Traditional model-based control relies on accurate system models, often impractical in real machining. Intelligent control—especially fuzzy logic and adaptive methods—offers robustness against uncertainty and nonlinearity. Fuzzy logic incorporates expert knowledge into decision-making; adaptive control adjusts parameters in real time. Their integration enables stable, high-precision machining. This Special Issue invites contributions on modeling, monitoring, optimization, and control of precision machining, focusing on fuzzy logic, adaptive control, and hybrid approaches. Both theoretical and applied work is welcome.

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