Title: Novel Precision Motion Control Methods for Practical Mechatronic Systems: An Evolving Perspective.

Abstract: To meet the progressively stringent demands for trajectory tracking performance in precision/ultra-precision industry, the research on advanced mechatronic motion control methods has attracted more and more attentions. Several performance-oriented motion control strategies represented by extended iterative learning control, gated recurrent units control, and real-time iterative compensation control, will be gradually introduced from an interesting evolving perspective. Tracking performances including tracking accuracy, extrapolation capability for non-repetitive trajectories, and disturbance rejection ability under different control strategies are experimentally verified on practical precision mechatronic motion stages. By combining quantitative experimental results with underlying control mechanism analysis, a comprehensive and reliable selection guidance of novel precision motion control methods can be provided for different practical industrial scenarios.