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State-space based designing of control systems

Abstract: Recently published research results show how sculpting the state space by fuzzy rule bases can outperform crisp systems. The presentation proposes a correlation of these results with the fuzzy-interpolative methodology, which is relying on the phase trajectory's analysis of the control error, in the frame of the state-space hypersurfaces. Fuzzy-interpolative controllers and adaptive correctors are designed on behalf of the state-space hypersurfaces' shapes, and their tuning is consisting in the appropriate modification of these surfaces. Case studies and applications are presented.