

Fuzzy Controllers Design Using Space-Filling Curves

Elshafei-Ahmed, M. Ahmed, M.S.;Dept. of Syst. Eng., King Fahd Univ. of Pet.Miner.,
Dhahran;

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King Fahd University of Petroleum & Minerals

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Summary

We present a clustering technique for fuzzy rules based on Hilbert space-filling curves (SFC). SFC scans an n-dimensional space and reduces it to a curve, i.e. a one-dimensional line. We first introduce the Hilbert space-filling curves, and outline the algorithms for clustering and adaptive clustering which demonstrate SFC efficient self-organizing features. We then propose a SFC fuzzy inference model based on clustering the object space. The SFC fuzzy model is then used to design a fuzzy controller. The proposed method achieves a dramatic reduction of the complexity of fuzzy controller by reducing the multivariable fuzzification problem to a one dimensional space

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