

# "Uncertain Rule-Based Fuzzy Logic Systems for Wireless Communications"

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Traditional fuzzy logic systems are unable to handle the uncertainties of real-world applications.

By "handle" I mean directly model and minimize the effect of. In this talk I will explain rule-based type-2 fuzzy logic systems and how they can handle a broad range of uncertainties totally within their framework. This is accomplished by adding a new mathematical dimension--a third dimension--to type-1 fuzzy sets, so that their two-dimensional membership functions become three-dimensional.

This additional dimension provides new design degrees of freedom that let type-2 fuzzy logic systems outperform type-1 fuzzy logic systems when uncertainties are present. I will illustrate type-2 fuzzy logic systems, as time permits, from the following: equalization of time-varying non-linear digital communication channels, overcoming co-channel interference and inter-symbol interference for time-varying non-linear digital communication channels, connection admission control for ATM networks, and rule-based classification of video data working directly in the compression domain.