COURSE OFFERED

Spring Semester 2003
EE 584: CHAOTIC SYSTEMS

DEN, Th. 6:30-9:10 p.m.
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Summary

This course will be geared towards developing mathematical tools for dealing with such new applications of “complicated” (or “chaotic”) nonlinear dynamics as self-similar Internet traffic analysis, nonlinear oscillations in electromyography (EMG), quasi-periodic planetary motions, etc. The complicated natural and man-made phenomena referred to will be analyzed using such concepts as invariant measure, self-similarity, “heavy-tail” property, ergodicity, etc. Next, such phenomena will be modeled from “first principles” when possible and, should such first principles be unavailable or of doubtful validity, from experimental time series (e.g., nonlinear ARMA modeling via Alternating Conditional Expectation). Control techniques specifically aimed at controlling complicated nonlinear dynamics, e.g., Active Queue Management, will also be developed.