

Lectures on Pure and Applied Math



Announcing

A Seminar Presentation
on May 2, 2013 at 1:30 pm

Henry Lee Institute 301

at The University of New Haven

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Title: Information Theory for Complex Systems

Abstract:

Complex systems are characterized by nonlinear dynamics which create a mixture of ordered and disordered states. Linear systems can be modeled by separating the ordered and disorder states and because of the law of large numbers, the Gaussian distribution is a very good model of the disordered noise. In contrast nonlinear mixing between the deterministic and stochastic components of a system, shifts the character of the noise to distributions with slower than exponential decay. Pioneers such as Alfréd Rényi and Constantino Tsallis have demonstrated that a generalized entropy function can describe the wide-spread presence of these 'power-law' or 'heavy-tail' distributions in natural systems. Recasting their approach in terms of the degree of Nonlinear Statistic Coupling provides a mathematically symmetric and physically intuitive perspective on information theory for complex systems. Innovations arising from this approach include improved performance metrics for decision systems and new approaches to information fusion.

Further Information

Refreshments are served from 1:20 pm until 1:30 pm.