

# Faculty of Computer Science CS6999 Reading Course Presentation

## Pattern Recognition as Entropy Minimization

By

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*3:30 p.m.*

*ITC317*

STUDENTS ARE ENCOURAGED TO ATTEND

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One important aim of Pattern Recognition can be stated as the attempt to discover global structure by analyzing the interrelationships of substructures. An "entropy function" quantifies this interrelationship by comparing the amount of entropy (or "disorder") in a structure to the sum of the entropies present in the constituent substructures; the function returns zero when order is total, and a positive value (with magnitude corresponding to the amount of disorder) otherwise. Thus, a guiding principle for Pattern Recognition, the "Principle of Minimal Entropy", can be specified as follows. For a given system, minimization of an appropriate entropy function (maximization of the system's "order") allows us to determine what information is central to the specification of the system's structure. Several applications of this principle will be presented, including the Principle Axis Method, Discriminant Surfaces, Clustering Techniques, and Information Compression.