RISE Talks Series

Who?	Linda Ness, Visiting Scholar, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University
What?	Examples of Automated Detection of Patterns in Data at Multiple Scales
When?	12:00-1:00 on Wednesday, November 29
Where?	Hall of Sciences, Room 326

When confronted with real world data one often does not know what statistical model would appropriately model the data and one may be lacking the statistical expertise to use classic statistical models. Furthermore, different patterns may be observed over different time intervals or different localities. However, it is possible to exploit several representation theorems from mathematics, accessible to undergraduates, to automatically detect patterns at different scales. I'll illustrate two of these techniques: one relying on a little-known binary tree representation of a very large class of statistical distributions and the other relying on repeated use of the marvelous Singular Value Decomposition Theorem from Linear Algebra. The techniques will be illustrated on several different types of data sets including: time-series data, binary feature data, and 3-D image data.