

Strange Bedfellows: Quantum Mechanics and Data Mining

Wednesday 7 September 2011 09:00 (40 minutes)

All fields of scientific research have experienced an explosion of data. Analyzing this data to extract unexpected patterns presents a computational challenge that requires new, advanced methods of analysis. DQC (Dynamic Quantum Clustering), invented by David Horn (Tel Aviv University), is a novel, interactive and highly visual approach to this problem. Studies are already underway at SLAC to apply this technology to, among other things, discovering hard-to-find events in particle physics data, analyzing Fermi/Glast data and implementing large scale SSRL XAF studies of the in-situ chemistry of macroscopic heterogeneous samples. The method has also been applied to problems in medicine, bio-informatics and even the stock market. My talk will provide a brief introduction to the distinction between supervised and unsupervised methods in data mining (clustering in particular). Then, I will, very briefly, discuss the theory of DQC and show a simple application. Finally I will review some of the problems that have been studied to date. This part of the discussion will, as an aside, present a very simple visualization technique that makes it possible to see very small features in two-dimensional data (think Dalitz plots).

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