Department of Applied and Computational Mathematics and Statistics Colloquium

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Does Knowledge of Shapes Matter in Statistics?

In many practical scenarios, from astronomy to zoology, often there's scientific knowledge that inform us about underlying shape of a curve relating two or more objects or the probability distribution of objects in a given population. A few examples include mass-radius relations among exoplanets in astronomy are known to preserve monotone relations, projectiles of objects are known to follow a concave path, production and utility theory in economics prescribes various convexity constraint, dose-response curves are monotone with asymptote, densities of log-returns in finance are unimodal but non-normal. This talk provides a brief tour of shape constrained methodologies for regression and density estimation and explores whether and how the scientific background knowledge of the possible shapes of objects may inform statistical inference. Several computational algorithms are presented and also a few unsolved problems are posed as challenges.

Friday, March 22, 2019
4:15 PM – 5:15 PM
127 Hayes-Healy Center

Colloquium Tea 3:45 PM to 4:15 PM 101A Crowley Commons Room