The College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

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Thursday, February 20
Room 608, 2925 Campus Green Drive
2:00-3:00 pm

Post-hoc Uncertainty Quantification for Remote Sensing Observing Systems

The ability of space borne remote sensing data to address important Earth and climate science problems rests crucially on how well the underlying geophysical quantities can be inferred from these observations. Remote sensing instruments measure parts of the electromagnetic spectrum and use computational algorithms to infer the unobserved true physical states. However, the accompanying uncertainties, if they are provided at all, are usually incomplete. There are many reasons why including but not limited to unknown physics, computational artifacts and compromises, unknown uncertainties in the inputs, and more.

In this talk I will describe a practical methodology for uncertainty quantification of physical state estimates derived from remote sensing observing systems. The method we propose combines Monte Carlo simulation experiments with statistical modeling to approximate conditional distributions of unknown true states given point estimates produced by imperfect operational algorithms. Our procedure is carried out post-hoc; that is, after the operational processing step because it is not feasible to redesign and rerun operational code. I demonstrate the procedure using four months of data from NASA's Orbiting Carbon Observatory-2 mission, and compare our results to those obtained by validation against data from the Total Carbon Column Observing Network where it exists.

Refreshments will be served 3:00-3:30 pm in the same location
Room 608, 2925 Campus Green Drive

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