STAT 280B-01: Seminars in Statistics on Nov-25th, 2019 (Monday 4pm in Engineering 2, Room 192)

Speaker: Jason Bernstein, Lawrence Livermore National Laboratory

Title: Keeping Track of Space-Objects

Abstract: Tracking space-objects is important for managing space traffic and predicting collisions. The problem is difficult due to data association and orbit model uncertainty, as well as clutter or non-object detections. Assuming a mixture model for data from the different objects and clutter, this talk discusses an Expectation-Maximization (EM) algorithm for simultaneous data association and orbit determination. The method is applied to simulated angles-only measurements of multiple objects with Keplerian orbits. Under a spherical normal likelihood model, the EM algorithm is shown to accurately perform data association and compute maximum likelihood estimates of orbit parameters. Future work directions, including tracking an unknown number of objects and modeling stochastic perturbations, are also discussed.