Jeff Morris - March 22nd

Talk Title: Regression and Spatiotemporal Quantile Functional Modeling of Distributional Data from Data Streams, and some comments about the key role of statisticians and data scientists during the pandemic.

Abstract: My presentation will have two distinct parts:

Quantile Functional Regression: In many areas of science, technological advances have led to devices that produce an enormous number of measurements per subject.  Frequently, researchers deal with these data by extracting summary statistics from these data (e.g. mean or variance) and then modeling those, but this approach can miss key insights when the summaries do not capture all of the relevant information in the raw data.  One of the key challenges in modern statistics is to devise methods that can extract information from these big data while avoiding reductionist assumptions.    In this talk, we will discuss methods for modeling the entire distribution of the measurements observed for each subject and relating properties of the distribution to covariates.  We illustrate this method on biomedical imaging data and climate change data.  Our analysis of 255 temperature sites in Iceland over the past 60+ years demonstrates that there is considerable geospatial variability in the climate change, and highlights how other aspects of the distribution besides the mean, in particular the tails, may have more dramatic biological and societal impacts that we believe should be summarized and publicized.

Key role of statistics in the pandemic: In the second part of this presentation, I will discuss the fundamental role of statistics and data science in managing the global pandemic.  I will discuss a [https://covid-datascience.com](https://nam01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcovid-datascience.com%2F&data=04%7C01%7CMatt.Koslovsky%40colostate.edu%7Cb785361667724204351d08d8e24d208f%7Cafb58802ff7a4bb1ab21367ff2ecfc8b%7C0%7C0%7C637508168210907614%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=4jhgC37VQr0Wgl6Vt2Vrb9gggy%2BFuG3F2hYQC%2BgaVeU%3D&reserved=0) blog I have published to apply my skills and perspective as a statistical data scientist to evaluate and synthesize accruing information in the pandemic, debunking misinformation and filtering out political and other sources of bias, to clearly communicate objective, empirically-based knowledge about various aspects of the pandemic to the general audience.  I will mention some of the topics in which I have tried to shed statistical light on some misunderstood issues in the pandemic, and make the case that we statisticians need to be more actively involved with the media and societal decision makers to bring our much-needed perspective to bear on the most important societal problems, which almost always have subtle quantitative nuances that are easily misunderstood.