

DEPARTMENT OF STATISTICS

**Matthias Katzfuss**Department of Statistics
Texas A&M University*Gaussian-Process Approximations for Big Data***October 9, 2019****11:45am – 12:45pm**

Light refreshments will be served

110 Frelinghuysen Road**Hill Center, Room 552**

Abstract: Gaussian processes (GPs) are popular, flexible, and interpretable probabilistic models for functions. GPs are well suited for big data in areas such as machine learning, regression, and geospatial analysis. However, direct application of GPs is computationally infeasible for large datasets. We consider a framework for fast GP inference based on the so-called Vecchia approximation. Our framework contains many popular existing GP approximations as special cases. Representing the models by directed acyclic graphs, we determine the sparsity of the matrices necessary for inference, which leads to new insights regarding the computational properties. Based on these results, we propose novel Vecchia approaches for noisy, non-Gaussian, and massive data. We provide theoretical results, conduct numerical comparisons, and apply the methods to satellite data.

Bio: Matthias Katzfuss is an Associate Professor in the Department of Statistics at Texas A&M University. His research interests include spatial and spatio-temporal statistics, computational statistics for massive datasets, and data assimilation, with applications to environmental problems and satellite remote-sensing data. His research has been funded by NSF, NASA, NOAA, and the Jet Propulsion Laboratory. Matthias is the recipient of an NSF Career Award, a Fulbright Scholarship, and an Early Investigator Award by the ASA Section on Statistics and the Environment.

