

High-dimensional Inference with Stochastic Approximation Algorithms

ABSTRACT – Stochastic approximation algorithms like SGD are widely used in modern data science. In order to perform statistical inference with such algorithms, it is important to not only obtain point estimates but also to obtain confidence regions quantifying the associated uncertainty. In this talk, I will discuss high-dimensional central limit theorems for linear functionals of online SGD iterates for solving over parameterized linear regression. Such results could be used for example to obtain prediction confidence intervals or entry-wise estimation confidence intervals. Our results hold in particular when the dimensionality grows exponentially in terms of the number of iterations of SGD (or equivalently the number of observations used). We will discuss such results for both the last SGD iterate and the average of the SGD iterates and highlight the similarities and differences between them.



Dr. Krishna Balasubramanian
Assistant Professor
Department of Statistics
University of California, Davis

SPEAKER BIO – Krishna Balasubramanian is an Assistant Professor in the Department of Statistics, University of California, Davis. His research interests include stochastic optimization and sampling, network analysis, and non-parametric statistics. His research was/is supported by a Facebook PhD fellowship, and CeDAR and NSF grants.