# Boston University Statistics and Probability Seminar Series

# Bayesian Centroid Estimation

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January 23, 11-noon,
Mathematics and Computer Science (MCS) Building, Room 135
111 Cummington Street, Boston

**Abstract:** Maximum likelihood estimators have traditionally dominated discrete inference for a long time. In this work we apply statistical decision theory to derive a new contender that minimizes a posterior generalized Hamming loss: the centroid estimator. The centroid estimator is formally characterized as a solution to a discrete optimization problem having posterior marginal distributions as inputs. We discuss both specific constraints of interest and broad conditions under which this optimization problem becomes tractable and provide further generalizations to centroid estimation. We illustrate centroid estimation with simple applications to stochastic grammar parsing, reconstruction of ancestral states given a phylogeny, and RNA secondary structure prediction. Finally, we offer a few concluding remarks and directions for future work.

For directions and maps, please see *http://math.bu.edu/research/statistics/statseminar.html.*