# Optional Polya Tree and Bayesian Inference

*Wing-Hung Wong*
*Department of Statistics*
*Stanford University*
*Stanford, CA 94305-4065*
whwong@stanford.edu

**Abstract**

We introduce an extension of the Polya Tree approach for constructing distributions on the space of probability measures. By using optional stopping and optional choice of splitting variables, the construction gives rise to random measures that are absolutely continuous with piecewise smooth densities on partitions that can adapt to fit the data. The resulting "optional Polya tree" distribution has large support in total variation topology, and yields posterior distributions that are also optional Polya trees. After outlining the theory, we will explain the computation of the posterior distribution and discuss some applications. This is based on joint work with Li Ma.