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**Farzana Nasrin\*** (fnasrin@utk.edu), Department of Mathematics, University of Tennessee, Knoxville, TN 37996, and **Cassie P. Micucci** and **Vasileios Maroulas**. *Estimation of Posterior Cardinality and Intensity Using Bayesian Framework for Persistent Homology*.

Topological data analysis, builds on techniques from topology, has proved to be one of the most promising in the field of data science yielding astounding results in variety of applications. Persistence diagram is a powerful tool originated in topological data analysis that allows retrieval of important topological and geometrical features latent in dataset. The Bayesian inference for persistence diagrams is recently introduced relying on the theory of Poisson point processes. In this work, we propose a Bayesian framework that adopts independent and identically distributed cluster point process characterization of persistence diagrams. This framework provides flexibility to simultaneously estimate the posterior cardinality and intensity by utilizing more general point process than Poisson. We present closed forms of the posterior intensity and cardinality under the assumption of conjugate families of Gaussian mixtures. Based on these forms, application to data analysis will be presented. (Received January 25, 2019)