

Least squares estimation of a completely monotone pmf: from Analysis to Statistics

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We consider the class of completely monotone probability mass functions (pmf) from a statistical perspective. An element in this class is known to be a mixture of geometric pmfs, a consequence of the celebrated Hausdorff Theorem. We show that the complete monotone least squares estimator exists, is strongly consistent and converges weakly to the truth at the \sqrt{n} -rate. Furthermore, we fully describe its limit distribution as the unique solution of a well-posed minimization problem. Through a simulation study we assess the performance of the method under different scenarios.