Department of Statistics

MASTER'S THESIS PRESENTATION

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Goodness-of-Fit Tests for Hidden Markov Models Using Fuzzy *p*-Values

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Eckhart 110, 5734 S. University Avenue

ABSTRACT

Hidden Markov Models (HMMs) serve as a practical extension of Markov chains that have been used for a wide variety of applications, including speech recognition, bioinformatics, and time series. It is often desirable to compare the fit of HMMs of various orders, especially first and second order HMMs. While both frequentist and Bayesian approaches already exist for HMM model selection, we propose a new method, in the spirit of Thompson & Geyer's (2007) use of fuzzy *p*-values, which allows us to directly examine the distribution of the underlying hidden sequence for each model and compare non-nested models of different orders. Finally, we examine the performance of this method under various scenarios with simulated data and compare the results with those of existing methods.

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