THE RESTORATION OF MISSING DATA USING BAYESIAN NUMERICAL METHODS

William J. Fitzgerald

The Department of Engineering,

Cambridge University

ABSTRACT

This paper will outline a method for restoring missing samples in digital signals. The missing samples are imputed using a Markov Chain Monte Carlo approach and an introduction to these numerical techniques will be given. One application area will be presented from the area of digital audio restoration where clicks are a familiar problem, and can take the form of sudden unexpected bursts of impulsive noise with random but finite duration. These bursts of noise have numerous causes such as dirt, electrical interference or mechanical damage to the storage medium. The original signal is often effectively lost. Several methods of detecting clicks have been devised, with the best approaches being model based. Once a click has been detected the "suspect" samples are removed and replaced by interpolation. Results obtained on both synthetic and real data will be given.