

## **Models for forensic speaker comparison**

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We present preliminary results from a collaboration between statisticians and forensic phoneticians which aims to develop models that quantify forensic phonetic evidence more reliably. Focusing initially on the single hesitation marker "um" from speech recordings from the DyViS database (Nolan et al 2009), we analyse linguistic features (vowel formants F1, F2, F3 and duration) in univariate and multivariate random effect models. Simulation studies show that, with a sufficient number of "um" tokens, speaker comparisons can be made with relatively low error rates. While this result is promising for single vowel analysis, in a realistic scenario phoneticians would need to analyse all words/vowels from a recording simultaneously. We discuss the statistical challenges involved in combining evidence from multiple words/vowels and some possibilities for dealing with this issue.