

# **An approximation of a multivariate stochastic model for the analysis of longitudinal data**

## **ABSTRACT**

We propose to approximate a model for multivariate repeated measures that incorporated random effects, correlated stochastic process and measurements error. The model is generalization for univariate longitudinal data given by Taylor et al. (1994). The stochastic process used in this paper is the multivariate Integrated Ornstein-Uhlenbeck (IOU) process. We consider a Bayesian approach which is motivated by the complexity of the model, thus, we propose to approximate the IOU stochastic process in a simple way that will mitigate the necessity to invert the stochastic process covariance matrix separately for each group at each iteration of the Markov Chain Monte Carlo (MCMC) sampler. The proposed method is illustrated by application to the melanoma data set.

**Keyword:** Integrated Ornstein-Uhlenbeck, Longitudinal, Melanoma, Stochastic process