

# **Analysis of Sparse Asynchronous Longitudinal Data**

**Hongyuan Cao**

**University of Chicago**

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We consider estimation of regression models for sparse asynchronous longitudinal observations, where time-dependent response and covariates are observed intermittently within subjects. Unlike with synchronous data, where response and covariates are observed at the same time point, with asynchronous data, the observation times are mismatched. Simple kernel weighted estimating equations are proposed for generalized linear models with either time-invariant or time-dependent coefficients. For models with either time-invariant or time-dependent coefficients, the estimators are consistent and asymptotically normal. However, they converge at rates which are slower than the rates which may be achieved with synchronous longitudinal data with response and covariates measured at the same time points. Simulation studies evidence that the methods perform well with realistic sample sizes and may be superior to methods for synchronous data based on an ad hoc last value carry forward approach. The practical utility of the methods is illustrated on data from an HIV study.

This is joint work with Donglin Zeng and Jason P. Fine.