

# Dynamic risk prediction of a clinical event with sparse and irregularly measured longitudinal biomarkers

Yayuan Zhu

*University of Western Ontario*

*E-mail: yayuan.zhu@uwo.ca*

**Abstract:** Dynamic prediction of the risk of a clinical event by using longitudinally measured biomarkers or other prognostic information is important in clinical practice. It helps investigators understand the mechanism of disease progression and facilitates early prevention, decision making and resource planning. In this presentation, I will introduce the background and recent methodological development for dynamic risk prediction. We also propose a new class of semi-parametric landmark survival models applied to the context of sparse and irregularly measured longitudinal predictors. The model takes the form of linear transformation and allows all the model parameters to vary with the landmark time. This model includes many published landmark prediction models as special cases and imposes weaker assumptions. We develop a unified local polynomial estimation framework to estimate the unknown model components. We apply the proposed method to a data set from the African American Study of Kidney Disease and Hypertension (AASK) and predict individual patients' risk of end-stage renal disease (ESRD) or death as an illustration.