## Time-dependent predictive values of prognostic biomarker

by

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## Abstract

Rigorous statistical evaluation of the predictive values of novel biomarkers is critical prior to applying novel biomarkers into routine standard care. It is important to identify factors that influence the performance of a biomarker in order to determine the optimal conditions for test performance. We propose a covariate-specific time-dependent PPV curve to quantify the predictive accuracy of a prognostic marker measured on a continuous scale and with censored failure time outcome. The covariate effect is accommodated with a semiparametric regression model framework. We adopt a smoothed survival time regression technique to account for the situation where risk for the disease occurrence and progression is likely to change over time. In addition, we provide asymptotic distribution theory and resampling-based procedures for making statistical inference on the covariate specific positive predictive values.