Cox Models With Smooth Functional Effect of Covariates Measured With Error

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We propose, develop, and implement a fully Bayesian inferential approach for the Cox model when the log hazard function contains unknown smooth functions of the variables measured with error. Our approach is to model nonparametrically both the log-baseline hazard and the smooth components of the log-hazard functions using low-rank penalized splines. Careful implementation of the Bayesian inferential machinery is shown to produce remarkably better results than the naive approach. Our methodology was motivated by and applied to the study of progression time to chronic kidney disease as a function of baseline kidney function and applied to the Atherosclerosis Risk in Communities study, a large epidemiological cohort study. Speaker's website can be found at `http://www.biostat.jhsph.edu/~ccrainic/` and the paper associated with the talk can be found at
`http://pubs.amstat.org/doi/pdf/10.1198/jasa.2009.tm08160`.