Bayesian single-index joint models of multivariate longitudinal and survival data

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Abstract: We propose a joint model for multivariate longitudinal and survival data. One main feature of the posited model is that we relax the commonly used linear or nonlinear assumption for trajectory functions shared by longitudinal processes and survival processes, by using partial linear single-index model to specify these functions. Based on our proposed feasible high-efficient algorithm for computing survival and penalized splines for link function in single-index model, a Bayesian approach is proposed to simultaneously obtain Bayesian estimates of unknown parameters, random effects and non-parametric functions by combining the Gibbs sampler and the Metropolis-Hastings algorithm. Several simulation studies and an example are presented to illustrate the propose methodologies. studies and a real example are used to illustrate our proposed methodologies.