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Multiply robust higher order U-statistics estimators for continuous time dependent censoring

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Under coarsening at random, doubly robust estimators exist for the unconditional survival distribution with continuous time right censoring in the presence of dependent censoring explainable by high dimensional time-dependent covariate processes.

In this talk, I describe multiply (ie triply, quadruple, etc) robust estimators based on higher order influence functions. These estimators are higher order U statistics. We posit a number of models for the joint distribution of the full data and for the censoring mechanism such that if any one of the many models is correct, we obtain a consistent asymptotically normal estimator of the survival distribution. The more models one uses the higher the required order of the U-statistic and the slower the rate of convergence which in general will be less than the parametric rate.

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