

Statistics Seminar

Concordance-Assisted Learning for Individualized Treatment Regimes

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Abstract: In the first part of the talk, we propose a new concordance-assisted learning for estimating optimal individualized treatment regimes. We first introduce a type of concordance function for prescribing treatment and propose a robust rank regression method for estimating the concordance function. We then find treatment regimes, up to a threshold, to maximize the concordance function, named prescriptive index. Finally, within the class of treatment regimes that maximize the concordance function, we find the optimal threshold to maximize the value function. Although this method makes better use of the available information through pairwise comparison, the objective function is discontinuous and computationally hard to optimize. In the second part of the talk, we consider a convex surrogate loss function to solve this problem. In addition, our algorithm ensures sparsity of decision rule and makes it easy to interpret. Simulation results of various settings and application to STAR*D both illustrate that the proposed method can still estimate optimal treatment regime successfully when the numb of covariates is large.

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