Rank Regression

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Abstract:

Let (X_i, Y_i) be generated by a semi-parametric monotone single index model, where

$$h(Y_i) = g(X_i'\beta, \epsilon_i), \tag{1}$$

with h strictly increasing, g increasing in both arguments, and the ϵ_i iid F, independent of $X_i \in \mathbf{R}^d$.

If only the (X_i, R_i) are observed, where $R_i = \text{rank}(Y_i)$, then β is unidentifiable; even when g is known. However, using only the (X_i, R_i), it is possible to estimate $\gamma = \beta/||\beta||$.

We discuss several algorithms for estimating γ from the (X_i, R_i), including spearmax estimation [1] and sliced inverse regression [3]. We focus on consistency and asymptotic distribution theory for the resulting parameter estimates.

References

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