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ParceLiNGAM: A causal ordering method robust against latent confounders

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We consider learning a causal ordering of variables in a linear non-Gaussian acyclic model called LiNGAM. Several existing methods have been shown to consistently estimate a causal ordering assuming that all the model assumptions are correct. But, the estimation results could be distorted if some assumptions actually are violated. In this paper, we propose a new algorithm for learning causal orders that is robust against one typical violation of the model assumptions: latent confounders. The key idea is to detect latent confounders by testing independence between estimated external influences and find subsets (parcels) that include variables that are not affected by latent confounders. We demonstrate the effectiveness of our method using artificial data and simulated brain imaging data.

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