

## Result for Task *CauseEffectPairs*

**Title:** *Distinguishing between Causes and Effects with Nonlinear Acyclic Causal Models*

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**Task(s) solved:**

*CauseEffectPairs*

**Method:**

*We propose a nonlinear acyclic causal model in which each observed variable is generated as a nonlinear function of its parents with additive noise followed by possible sensor nonlinear distortion. For the two-variable case, we give the conditions under which the proposed causal model could be identified uniquely. A two-stage method, which is constrained nonlinear ICA followed by statistical independence test, is proposed to distinguish causes from effects.*

Preprocessing: *standardization*

Model selection: *cross validation*

Causal discovery: *information-theoretic method*

**Results:**

Table 1: Result table for the task *CauseEffectPairs*.  
( $x_1$  is the variable associated with the first column of the data)

Data set	Result (direction of causality)	Remark
1	$x_1 \rightarrow x_2$	<i>Significant</i>
2	$x_1 \rightarrow x_2$	<i>Significant</i>
3	$x_1 \rightarrow x_2$	<i>Significant</i>
4	$x_2 \rightarrow x_1$	<b>But not significant !</b>
5	$x_2 \rightarrow x_1$	<i>Significant</i>
6	$x_1 \rightarrow x_2$	<i>Significant</i>
7	$x_2 \rightarrow x_1$	<i>Significant</i>
8	$x_1 \rightarrow x_2$	<i>Significant</i>