

D-ACES Framework Proposal and Analysis

Comparison with State-of-the-Art Methods (SynA)

Table 6.1: Comparison of Various *IFS* Methods: Best Results on Synthetic Dataset A

Methods	Mean(%)	Synthetic Datasets											
		A.1		A.2		A.3		A.4		A.5		A.6	
<i>D-ACES</i>	TPR	100		100		89.6		96.7		83.1		73.2	
	FDR	0		0		0		13.5		18.9		7.5	
<i>INVASE</i>	TPR	100	◇	100	◇	100	▲10.4	100	▲3.3	72.7	▼10.4	72.0	▼1.2
	FDR	0	◇	0	◇	0	◇	39.3	▲25.8	23.3	▲4.4	4.6	▼2.9
<i>L2X</i>	TPR	100	◇	99.8	▼0.2	80.5	▼9.6	82.7	▼14	75.9	▼7.2	78.3	▲5.1
	FDR	0	◇	0.3	▲0.3	19.5	▲19.5	20.2	▲6.7	26.5	▲7.6	21.8	▲14.3
<i>LIME</i>	TPR	39.0	▼61	100	◇	100	▲10.4	40.8	▼55.9	57.1	▼26	55.9	▼17.3
	FDR	61.0	▲61	0	◇	0.1	▲0.1	49.4	▲35.9	37.0	▲18.1	44.1	▲36.6
<i>SHAP</i>	TPR	60.6	▼39.4	88.0	▼12	94.0	▲4.4	64.5	▼32.2	66.9	▼16.2	65.2	▼8
	FDR	39.4	▲39.4	12.0	▲12	6.0	▲6	34.0	▲20.5	32.8	▲13.9	34.8	▲27.3

❖ Same explanations across instances

◆ Syn A.1

- Neural network based IFS (real-time): Better

◆ Syn A.1 - A.3

- LIME & SHAP: Unstable performance
- INVASE: Best

D-ACES Framework Proposal and Analysis

Comparison with State-of-the-Art IFS Methods (Syn A)

❖ Same explanations across instances

Table 6.1: Comparison of Various *IFS* Methods: Best Results on Synthetic Dataset A
◆ Syn A.1

Methods	Mean(%)	Synthetic Datasets											
		A.1		A.2		A.3		A.4		A.5		A.6	
<i>D-ACES</i>	TPR	100		100		89.6		96.7		83.1		73.2	
	FDR	0		0		0		13.5		18.9		7.5	
<i>INVASE</i>	TPR	100	◇	100	◇	100	▲10.4	100	▲3.3	72.7	▼10.4	72.0	▼1.2
	FDR	0	◇	0	◇	0	◇	39.3	▲25.8	23.3	▲4.4	4.6	▼2.9
<i>L2X</i>	TPR	100	◇	99.8	▼0.2	80.5	▼9.6	82.7	▼14	75.9	▼7.2	78.3	▲5.1
	FDR	0	◇	0.3	▲0.3	19.5	▲19.5	20.2	▲6.7	26.5	▲7.6	21.8	▲14.3
<i>LIME</i>	TPR	39.0	▼61	100	◇	100	▲10.4	40.8	▼55.9	57.1	▼26	55.9	▼17.3
	FDR	61.0	▲61	0	◇	0.1	▲0.1	49.4	▲35.9	37.0	▲18.1	44.1	▲36.6
<i>SHAP</i>	TPR	60.6	▼39.4	88.0	▼12	94.0	▲4.4	64.5	▼32.2	66.9	▼16.2	65.2	▼8
	FDR	39.4	▲39.4	12.0	▲12	6.0	▲6	34.0	▲20.5	32.8	▲13.9	34.8	▲27.3

• Nerual network based IFS (real-time): Better

◆ Syn A.1 - A.3

LIME & SHAP: Unstable performance

• INVASE: Best

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Application to Syn B

Table 6.2: Application Results of *D-ACES* on Synthetic Dataset B

Metrics(%)	Synthetic Datasets					
	B.1	B.2	B.3	B.4	B.5	B.6
Mean TPR	100	100	98.0	100	69.9	71.3
Mean FDR	0	0.2	0	42.9	13.2	27.9
λ^*	2	2.5	1.5	2.5	2.2	3