SOGA: Inference of Probabilistic Programs by Second-order Gaussian Approximation

Francesca Randone[1], Emilio Incerto[2], Luca Bortolussi[1], and Mirco Tribastone[2]

[1] University of Trieste, Italy
[2] IMT School for Advanced Studies Lucca, Italy

Table 1: Evaluation of *SOGA* accuracy and runtime as variables increase by using PyMC as ground truth due to PSI timing out. Each row shows the model's number of variables (# vars), absolute percentage errors ($|\%e|$), and *SOGA* runtime.

	SOGA		*PyMC*		
Model	*time (s)*	*value*	*time (s)*	*value*	$\|\%e\|$
$Timeseries_5$	0.055	0.998	264.22	0.994	0.36
$Timeseries_6$	0.055	2.048	217.92	2.060	0.61
$Timeseries_7$	0.061	1.999	456.20	2.033	1.66
$Timeseries_8$	0.065	2.361	537.86	2.373	0.51
$Timeseries_9$	0.069	2.879	to	-	-
$Timeseries_{15}$	0.082	5.347	to	-	-
$Timeseries_{25}$	0.084	6.185	to	-	-
$Timeseries_{45}$	0.122	6.575	to	-	-
$Timeseries_{65}$	0.162	6.622	to	-	-
$Timeseries_{85}$	0.214	6.628	to	-	-
$Timeseries_{100}$	0.421	6.628	to	-	-