The stochastic performance of each of the four existing chaotic maps based on modal operations is shown in Tables 1-Table IV, where the red font indicates the variable with the worst stochastic performance.

TABLE I   Performance comparisons for $x_{i,k}$ in 3D-ELLSM.

SVs	ShanEn	SampEn	SpecEn	PerEn	CorDim	DKY
$x_{1,k}$	9.993	2.188	0.555	6.575	2.001	3.000
$x_{2,k}$	9.993	2.187	0.555	6.576	1.982	3.000
$x_{3,k}$	9.993	2.196	0.549	6.576	1.318	3.000
δ^2	0	2.43E-05	0.000012	3.33E-07	0.151291	0

TABLE II   Performance comparisons for $x_{i,k}$ in 4D-PHS.

SVs	ShanEn	SampEn	SpecEn	PerEn	CorDim	DKY
$x_{1,k}$	9.993	2.190	0.542	6.576	1.997	4.000
$x_{2,k}$	9.993	2.187	0.542	6.576	1.986	4.000
$x_{3,k}$	9.993	2.196	0.549	6.576	1.751	4.000
$x_{4,k}$	9.993	2.122	0.552	6.575	1.242	4.000
δ^2	0	2.43E-05	0.000012	3.33E-07	0.151291	0

TABLE III   Performance comparisons for $x_{i,k}$ in 4D-PCM.

SVs	ShanEn	SampEn	SpecEn	PerEn	CorDim	DKY
$x_{1,k}$	9.993	2.187	0.550	6.576	2.001	4.000
$x_{2,k}$	9.993	2.187	0.557	6.576	1.978	4.000
$x_{3,k}$	9.993	2.419	0.551	6.569	1.065	4.000
$x_{4,k}$	9.993	2.187	0.560	6.575	2.002	4.000
δ^2	0	8.62E-05	1.15E-05	2.67E-07	0.090439	0

TABLE IV   Performance comparisons for $x_{i,k}$ in 7D-PCM.

SVs	ShanEn	SampEn	SpecEn	PerEn	CorDim	DKY
$x_{1,k}$	9.993	2.188	0.545	6.576	1.970	7.000
$x_{2,k}$	9.993	2.189	0.544	6.576	1.984	7.000
$x_{3,k}$	9.993	2.165	0.552	6.575	1.252	7.000
$x_{4,k}$	9.993	2.187	0.545	6.575	1.993	7.000
$x_{5,k}$	9.993	2.188	0.542	6.576	1.999	7.000
$x_{6,k}$	9.993	2.186	0.546	6.576	1.995	7.000
$x_{7,k}$	9.993	2.187	0.551	6.576	1.999	7.000
δ^2	0	0.013456	0.000023	1.13E-05	0.215728	0