Supplementary Material

Effect of Data Length on Time Delay and Embedding Dimension for Calculating the Lyapunov Exponent in Walking

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1. **Table 1. Effect of data length on calculating embedding dimension when using the Lorenz system**
2. **Table 2 Effect of data length on calculating embedding dimension when using the Rössler system**
3. **Figure 1. Mean (SD) of calculated time delay in known dynamical systems as data length is increased.**
4. **Figure 2. Mean (SD) of calculated embedding dimension in known dynamical systems as data length is increased.**

Table 1. Post-hoc Tukey results comparing embedding dimensions at all data lengths for the Lorenz System. Data length is in units of a thousand data points.

Signal Dir.	Data Length	Data Length Comparison						
		0.5	2	5	7.5	10	20	30
X	0.5	**-**	-	**-**	**-**	-	-	-
	2	**0.0001**	-	**-**	**-**	-	-	-
	5	**0.0001**	**0.0001**	**-**	**-**	-	-	-
	7.5	**0.0001**	**0.0001**	1.0000	**-**	-	-	-
	10	**0.0001**	**0.0001**	1.0000	1.0000	-	-	-
	20	**0.0001**	**0.0001**	1.0000	1.0000	1.0000	-	-
	30	**0.0001**	**0.0001**	1.0000	1.0000	1.0000	1.0000	-
	50	**0.0001**	**0.0001**	1.0000	1.0000	1.0000	1.0000	1.0000
Y	0.5	**-**	-	**-**	**-**	-	-	-
	2	**0.0001**	-	**-**	**-**	-	-	-
	5	**0.0001**	0.8420	**-**	**-**	-	-	-
	7.5	**0.0001**	0.8420	1.0000	-	-	-	-
	10	**0.0001**	0.8420	1.0000	1.0000	-	-	-
	20	**0.0001**	0.8420	1.0000	1.0000	1.0000	-	-
	30	**0.0001**	0.8420	1.0000	1.0000	1.0000	1.0000	-
	50	**0.0001**	0.8420	1.0000	1.0000	1.0000	1.0000	1.0000
Z	0.5	**-**	-	**-**	**-**	-	-	-
	2	1.0000	-	**-**	**-**	-	-	-
	5	1.0000	1.0000	**-**	**-**	-	-	-
	7.5	1.0000	1.0000	1.0000	-	-	-	-
	10	1.0000	1.0000	1.0000	1.0000	-	-	-
	20	0.5546	0.5546	0.5546	0.5546	0.5546	-	-
	30	0.5546	0.5546	0.5546	0.5546	0.5546	1.0000	-
	50	0.1003	0.1003	0.1003	0.1003	0.1003	0.9794	0.9764

Table 2. Post-hoc Tukey results comparing embedding dimensions at all data lengths for the Rössler System. Data length is in units of a thousand data points.

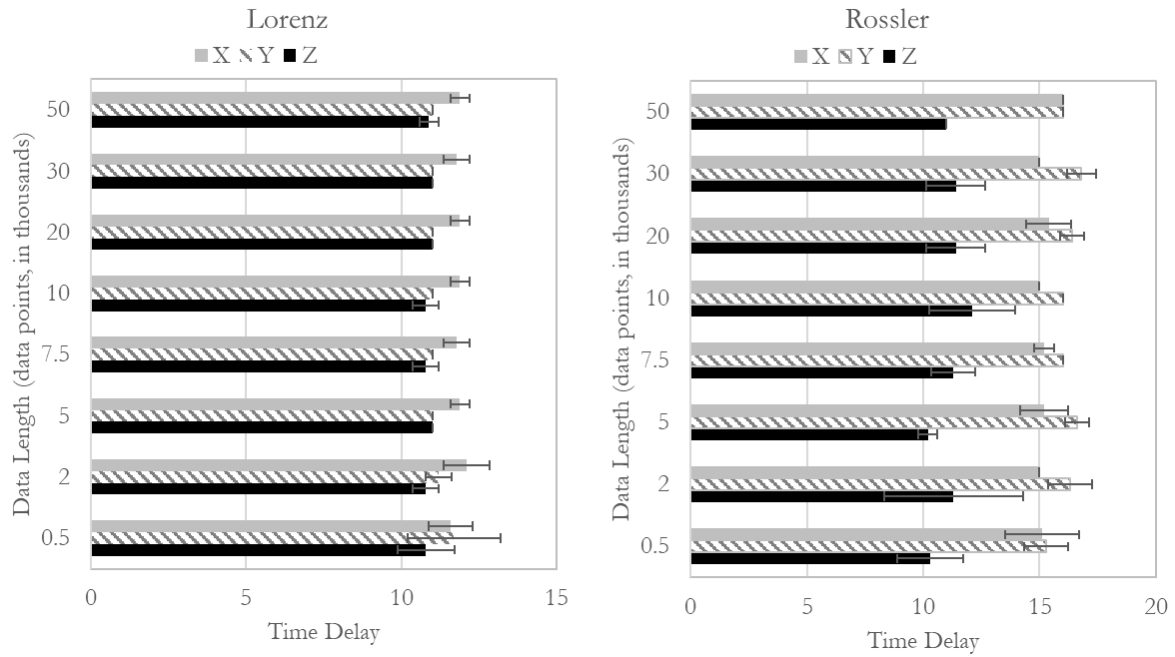| Signal Dir.	Data Length	Data Length Comparison						
		0.5	2	5	7.5	10	20	30
X	0.5	**-**	-	**-**	**-**	-	-	-
	2	**0.0001**	-	**-**	**-**	-	-	-
	5	**0.0001**	**0.0402**	**-**	**-**	-	-	-
	7.5	**0.0001**	**0.0015**	0.9602	-	-	-	-
	10	**0.0001**	**0.0015**	0.9602	1.0000	-	-	-
	20	**0.0001**	**0.0015**	0.9602	1.0000	1.0000	-	-
	30	**0.0001**	**0.0015**	0.9602	1.0000	1.0000	1.0000	-
	50	**0.0001**	**0.0015**	0.9602	1.0000	1.0000	1.0000	1.0000
Y	0.5	**-**	-	**-**	**-**	-	-	-
	2	**0.0001**	-	**-**	**-**	-	-	-
	5	**0.0001**	1.0000	**-**	**-**	-	-	-
	7.5	**0.0001**	1.0000	1.0000	-	-	-	-
	10	**0.0001**	1.0000	1.0000	1.0000	-	-	-
	20	**0.0001**	1.0000	1.0000	1.0000	1.0000	-	-
	30	**0.0001**	1.0000	1.0000	1.0000	1.0000	1.0000	-
	50	**0.0001**	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Z	0.5	**-**	-	**-**	**-**	-	-	-
	2	**0.0001**	-	**-**	**-**	-	-	-
	5	**0.0001**	1.0000	**-**	**-**	-	-	-
	7.5	**0.0001**	1.0000	1.0000	-	-	-	-
	10	**0.0001**	1.0000	1.0000	1.0000	-	-	-
	20	**0.0001**	1.0000	1.0000	1.0000	1.0000	-	-
	30	**0.0001**	1.0000	1.0000	1.0000	1.0000	1.0000	-
	50	**0.0001**	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Figure 1: Mean (SD) of calculated time delay in known dynamical systems as data length is increased.
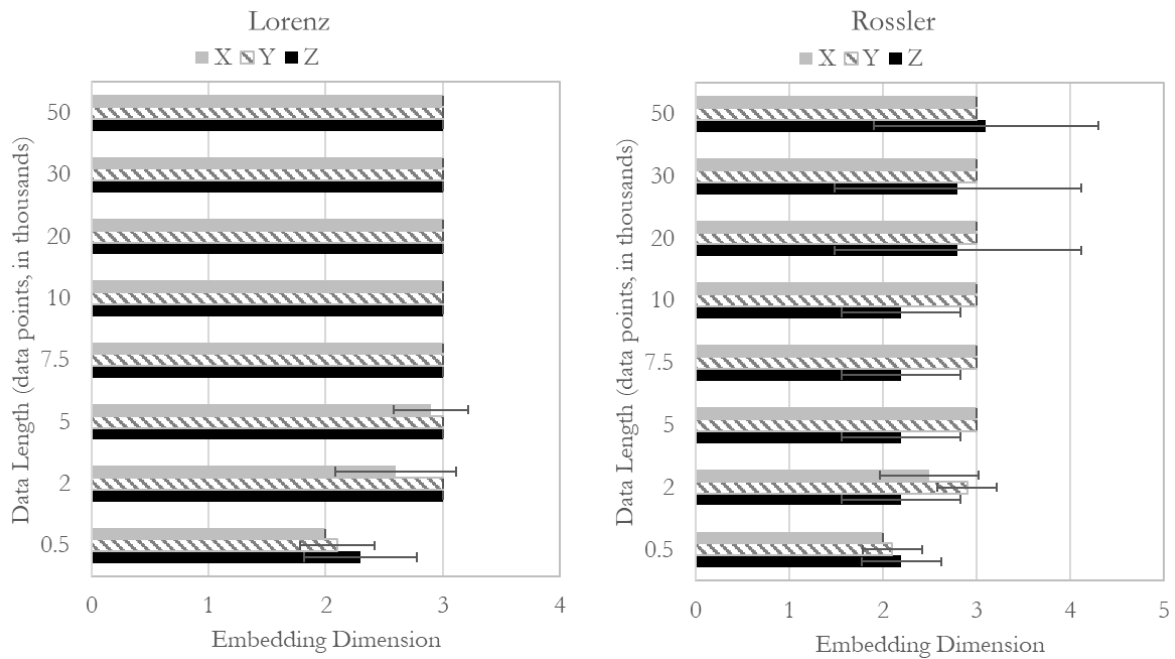

Figure 2: Mean (SD) of calculated embedding dimension in known dynamical systems as data length is increased.