IN·DEI·NOMINE·F

Radboud University Nijmegen

Behavioural Science Institute

Isn’t that amazing?

- Take a moment to realise what we just did:

- The state space (defined by X,Y and Z) of a complex, nonlinear chaotic system was reconstructed to a phase space (lag plot) of 3 surrogate dimensions X, $X_{t+\tau}$, $X_{t+2*\tau}$

- **You only need to measure one variable of a system!!**
  … because "everything is interacting"…
  *We **exploit (and need)** the dependencies in the data!*

The length of your data set needs to be long enough to create the surrogate dimension.

- The reconstruction process **does not make many assumptions about the data.** You can also try to reconstruct a phase space from a random variable. (What will happen?)

38

https://youtu.be/6i57udsPKms

https://youtu.be/6i57udsPKms

Isn't that amazing?

- Take a moment to realise what we just did:

- The state space (defined by X,Y and Z) of a complex, nonlinear chaotic system was reconstructed to a phase space (lag plot) of 3 surrogate dimensions X, X_{t+T}, X_{t+2*T}

- **You only need to measure one variable of a system!!**
  … because "everything is interacting"…
  *We **exploit (and need)** the dependencies in the data!*

The length of your data set needs to be long enough to create the surrogate dimension.

- The reconstruction process **does not make many assumptions about the data.** You can also try to reconstruct a phase space from a random variable. (What will happen?)

Suppose we have measured a true IID variable