

Dr David M. Walker

Complex systems, nonlinear time series applications

Detecting the direction of animal interactions from positional data

Extracting the interactions and the direction of influence between groups of animals of the same or different species is important for understanding competition, habitat use and general decision making of animals. Linear data processing methods applied to positional data of animals have been successful in detecting causal relationships between animals at a species or other group level. Can nonlinear methods match, or do better than, linear methods? In particular, can nonlinear methods such as partial mutual information mixed embedding technique extract the directions of interactions at an individual-based animal level? Data sets available for analysis are positional data of sheep and deer, male and female sheep and also pregnant and not pregnant sheep.