



T. Bossomaier, L. Barnett, M. Harré, J.T. Lizier

An Introduction to Transfer Entropy

Information Flow in Complex Systems

- ▶ **Subject at the nexus of information theory and complex systems**
- ▶ **Aimed at advanced undergraduate and graduate students in computer science, neuroscience, physics, and engineering**
- ▶ **Includes statistical and information-theoretic background and methods of calculation**

This book considers a relatively new metric in complex systems, transfer entropy, derived from a series of measurements, usually a time series. After a qualitative introduction and a chapter that explains the key ideas from statistics required to understand the text, the authors then present information theory and transfer entropy in depth. A key feature of the approach is the authors' work to show the relationship between information flow and complexity. The later chapters demonstrate information transfer in canonical systems, and applications, for example in neuroscience and in finance.

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The book will be of value to advanced undergraduate and graduate students and researchers in the areas of computer science, neuroscience, physics, and engineering.

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