

The Mathematics of Complex Streams



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Abstract: Complex streams of evolving data are better understood by their effects on nonlinear systems than by their values at times. The test nonlinear systems do not need to be context dependent. Core to rough path theory is a simple universal nonlinear system that captures all the information about a stream required to predict any response to any nonlinear system. This idealised mathematical feature set is known as the signature of the stream. Its abstract simplicity opens the possibilities for understanding and working with streams in the same context free way that calculators work with numbers. Signature-based techniques offer simple to apply universal numerical methods that are robust to irregular data and efficient at representing the order of events and complex oscillatory data. Specific software can be developed and then applied across many contexts. Signatures underpin prize winning contributions in recognizing Chinese handwriting, in detecting sepsis, and in generating financial data, and most recently in the ability to score streams as outliers against a corpus of normal streams. This principled outlier technology has emerged as a powerful unifying technique; it identifies radio frequency interference in astronomical data, brain injury from meg data,.... This talk will survey the field.

时间：2023年10月18日(周三) 16:00-17:00

地点：中国科学院数学与系统科学研究院 南楼 613 室

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