Using Geometry in Non-Parametric Statistics

About the talk

In non-parametric regression, the rates of estimation critically depend on the dimension, usually known as the curse of dimensionality. However, it has been long known that incorporating structure into the regression (such as sparsity) can improve on general rates. However, sparsity and most related concepts are linear in the data, while many patterns in regressions are non-linear in nature, and crucially depend on all the covariates. In this talk, we will consider how more general structure can be incorporated in non-parametric regression through the use of symmetries. General notions of symmetry corresponding to algebraic group structures can exhibit the similar dimension reduction phenomena, even in non-linear settings, and even in the case where the symmetries need to be estimated as part of the regression. We will also show that, by considering lattice structures, efficient computational estimation schemes to determine such symmetries are possible.

[Joint work with Louis Christie]

Speaker

John Aston

Statistical Laboratory
University of Cambridge, UK

Date and time

21 October 2024, 2pm

Singapore (GMT +8)

UK (GMT +1)

Scan QR code for Zoom link

The talks are part of the program on
Interactions of Statistics and Geometry (ISAG) II

NUS National University of Singapore | IMS Institute for Mathematical Sciences