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Localising Change Points in Piecewise Polynomials of General Degrees

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Abstract: I will start this talk by talking about the paper titled "Localising change points in piecewise polynomials of general degrees'' (https://arxiv.org/pdf/2007.09910.pdf), which is joint work with Sabyasachi Chatterjee (UIUC). In this paper we are concerned with a sequence of univariate random variables with piecewise polynomial means and independent sub-Gaussian noise. The underlying polynomials are allowed to be of arbitrary but fixed degrees. We propose a two-step estimation procedure based on the \ell_0-penalisation and provide upper bounds on the localisation error. We complement these results by deriving information-theoretic lower bounds, which show that our two-step estimators are nearly minimax rate-optimal. We also show that our estimator enjoys near optimally adaptive performance by attaining individual localisation errors depending on the level of smoothness at individual change points of the underlying signal.

Bio: Yi Yu is an Associate Professor in the Department of Statistics, University of Warwick and a Turing Fellow at the Alan Turing Institute, previously a Lecturer in the University of Bristol, a postdoc of Professor Richard Samworth and a graduate student of Professor Zhiliang Ying. I obtained my academic degrees from Fudan University (B.Sc. in Mathematics, June 2009 and Ph.D. in Mathematical Statistics, June 2013).