



Department of Decision Sciences

Statistics Seminar

Confidence distributions for change-points and regime shift

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Abstract

Suppose observations y_1, \dots, y_n stem from a parametric model $f(y, \theta)$ with the parameter taking one value θ_L for y_1, \dots, y_τ and another value θ_R for $y_{\tau+1}, \dots, y_n$. I will provide and examine two different general strategies for not merely estimating the break point τ but also to complement such an estimate with full confidence distributions, both for the change-point and for associated measures of differences between the two levels of θ . The first idea involves testing homogeneity for the two segments to the left and the right of a candidate change-point value at a fine-tuned level of significance. Carrying out such a scheme requires having a goodness-of-fit test for constancy of the parameter over a segment of indices, and I also develop classes of such tests. The second general method uses the log-likelihood function, profiled over the other parameters, and I show how this may lead to confidence inference for τ . The methods are illustrated for a couple of real data stories, with these meeting different types of challenges.