



Department of Decision Sciences

Statistics Seminar

## Confidence distributions for change-points and regime shift

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Thursday, 21<sup>st</sup> April 2016

12:30pm Room 3-E4-SR03 Via Röntgen 1 Milano

### Abstract

Suppose observations  $y_1, \dots, y_n$  stem from a parametric model  $f(y, \theta)$  with the parameter taking one value  $\theta_L$  for  $y_1, \dots, y_\tau$  and another value  $\theta_R$  for  $y_{\tau+1}, \dots, y_n$ . I will provide and examine two different general strategies for not merely estimating the break point  $\tau$  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  $\theta$ . 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  $\tau$ . The methods are illustrated for a couple of real data stories, with these meeting different types of challenges.