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Fakultät für
Mathematik, Informatik
und Naturwissenschaften

Kolloquium über Mathematische Statistik und Stochastische Prozesse

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22.06.2015, 16:15 Uhr, Hörsaal 4

Adaptive and minimax optimal inference of the tail coefficient

Abstract:

A fundamental problem in extreme value theory is the one of doing inference on the tail coefficient (or first order parameter), since it characterizes the nature of the extreme events. In this talk, I will first present the problem and provide a short review of literature. I will then present an alternative estimator for the tail index. This estimate is minimax-optimal, under the assumption that the model satisfies a second order Pareto type condition. Moreover, an adaptive version of this estimator adapts to the second order parameter, and achieves a rate that is minimax optimal simultaneously on all models. I will also discuss a second problem, which is the one of providing a confidence interval for the tail coefficient. This problem is actually linked to the problem of testing the complexity of the model, i.e. it is a complex composite testing problem. I will present a solution for this problem, and prove that it is minimax optimal.

This presentation will be based on two papers, which are joint work with Arlene Kim.

A. Carpentier and A.K.H. Kim. Adaptive and minimax optimal estimation of the tail coefficient. Accepted in Statistica Sinica, 2014.

A. Carpentier and A.K.H. Kim. Honest and adaptive confidence interval for the tail coefficient in the Pareto model. In the Electronic Journal of Statistic, 8(2), pp. 2066-2110, 2014.

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