



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics

**MASTER'S THESIS PRESENTATION**

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**Convergence of Dümbgen's Algorithm for Estimation  
of Tail Inflation**

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Jones 304, 5747 S. Ellis Avenue

**ABSTRACT**

Given a density  $f$  on the non-negative real line, Dümbgen's algorithm is a routine for finding the (unique) log-convex, non-decreasing function  $\hat{\phi}$  such that  $\int \hat{\phi}(x)f(x)dx = 1$  and such that the likelihood  $\prod_{i=1}^n f(x_i)\hat{\phi}(x_i)$  of given data  $x_1, \dots, x_n$  under density  $x \mapsto \hat{\phi}(x)f(x)$  is maximized. We summarize Dümbgen's algorithm for finding this MLE  $\hat{\phi}$ , and we present a novel guarantee of the algorithm's termination and convergence. We also discuss the asymptotic behaviour of the algorithm, and discuss rate of convergence..

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