



THE UNIVERSITY OF  
CHICAGO

DEPARTMENT OF STATISTICS

## Master's Thesis Presentation

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“Nonnegative Constraints on Image Reconstruction”

Monday, January 29, 2024, at 12:30 PM, in Jones 226, **and via Zoom**  
5747 S. Ellis Avenue  
(HYBRID TALK)

Zoom information sent in email announcement.

### Abstract

In this work, I implement an Alternating Direction Method of Multipliers (ADMM) framework originally designed for nonsmooth biconvex optimization. It has proven successful in addressing the Simultaneous Estimation of Activity and Attenuation (SAA) problem within Time-of-Flight Positron Emission Tomography (TOF-PET). To enhance the framework, I introduce a non-negativity constraint or penalty, adapting the ADMM-SAA algorithm to mitigate issues related to negative estimations during the iteration process. The result is a notably accelerated convergence rate and a substantial reduction in the occurrence of negative estimates throughout the iterative procedure.