



THE UNIVERSITY OF GEORGIA  
DEPARTMENT OF STATISTICS

# Colloquium Series

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**3:45 PM, Thursday, November 19, 2020**

**Zoom link: <https://zoom.us/j/7979236528>**

### **Locally Adaptive Weighting and Screening Approach to Spatial Multiple Testing**

Exploiting spatial patterns promises to improve both power and interpretability of false discovery rate (FDR) analyses. This article develops a new class of locally-adaptive weighting and screening (LAWS) rules that directly incorporates useful local patterns into inference by constructing robust and structure-adaptive weights according to the estimated local sparsity levels. LAWS provides a unified framework for a broad range of spatial problems and is fully data-driven. It is shown that LAWS controls the FDR asymptotically under mild conditions on dependence. The finite sample performance is investigated using simulated data, which demonstrates that LAWS controls the FDR and outperforms existing methods in power. The efficiency gain is substantial in many settings. We further illustrate the merits of LAWS through applications to the analysis of 2D and 3D images.

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