

UCLA

# BIOSTATISTICS SEMINAR

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## Denoise, Classification, and Quantitative Markers

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3:30pm - 4:30pm, CHS 33-105A

Refreshments served at 3:00 PM in room 51-254 CHS

### ABSTRACT:

Classification is a fun statistical problem and can be useful in medical application in high-throughput and large data set. Medical images are spatially correlated and influenced by systematic technical parameters and the random effect in patients' variation, which lead to different noisy levels and classification model. To make a robust classification, denoise with partial differential equation is applied to produce standardized images. To describe the spatial correlation, texture features are used. The combination of the smoothly clipped absolute deviation penalty (SCAD) and the support vector machine was used for selecting important variables (features) and for building a model.

In summary, the essential factors of classification are calibration, discrimination and accuracy to use the classification result as a marker in multicenter clinical trial. We present a denoising approach with consideration of anatomy, as part of calibration. Classification model has developed using an algorithm from the denoised features. Radiologist's scores are compared with the classification model driven, quantitative lung fibrosis (QLF) scores as part of discrimination and accuracy. Additionally, we consider the unbalanced data and adaptive denoise in the specific disease types of fibrosis and honeycomb.