

UCLA

# BIOSTATISTICS SEMINAR

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## Mapping Function Learning in a Noninvasive Intracranial Pressure Assessment Framework

**Xiao Hu, PhD**

Associate Professor  
UCLA Neurosurgery

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

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

**ABSTRACT:** Intracranial pressure (ICP) is an important physiological variable for managing brain injury patients. However, no clinically accepted medical device exists for noninvasive ICP assessment. Existing efforts to make a viable noninvasive ICP device have been focused on finding noninvasive alternative signals to correlate with ICP but their achievable accuracy is limited due to a lack of individualized calibration module. In this talk, we will discuss a novel approach to achieve individualized calibration without using invasive ICP for a *de novo* patient. This approach is built upon the integration with system identification and a case-based reasoning framework. A core element in this framework is a mapping function associated with an input/output model used to simulate ICP for a given noninvasive signal. This mapping function maps a noninvasive feature vector to an expected error of estimating ICP using the input/output model and hence facilitates the determination of an optimal model from a collection of models. We will illustrate the various solutions to learning the mapping functions including a baseline multivariate linear model, a model with ranking constraints, and a kernelized model.