

**Indiana University-Purdue University  
Indianapolis**  
**Department of Mathematical Sciences**

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, January 15, 2019  
LD 265

**Speaker:** Xiang Wang  
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**Title:** Generative Local Metric Learning for Kernel Regression

**Abstract:**

This paper shows how metric learning can be used with Nadaraya-Watson (NW) kernel regression. Compared with standard approaches, such as bandwidth selection, we show how metric learning can significantly reduce the mean square error (MSE) in kernel regression, particularly for high-dimensional data. We propose a method for efficiently learning a good metric function based upon analyzing the performance of the NW estimator for Gaussian-distributed data. A key feature of our approach is that the NW estimator with a learned metric uses information from both the global and local structure of the training data. Theoretical and empirical results confirm that the learned metric can considerably reduce the bias and MSE for kernel regression even when the data are not confined to Gaussian.