ABSTRACT:

Recently, a low cost yet highly sensitive colorimetric sensor array (CSA) for the detection and identification of volatile chemicals has been developed. Regression and classification analysis holds the key to the success of the array in discriminating multiple chemicals. The data output by CSA are in the form of tensor, which render many traditional classification methods inapplicable. In this talk, I will introduce a tensor dimension reduction method which can be viewed as a generalization of the sliced inverse regression method to the data with tensor predictors. The proposed method can greatly improve the sensitivity, and more importantly, the specificity of CSA. Numerical studies and asymptotic properties of the tensor dimension reduction method will also be discussed in this talk.