

# Nonparametric functional classification with sparsity and feature selection

Woncheol Jang

Department of Epidemiology and Biostatistics, University of Georgia

*E-Mail:* TBP

*Abstract:* With the power of modern technology, it is increasingly common to collect functional data in scientific studies that are beyond the capabilities of traditional statistical methods. Here data are considered as functional if data are regularly measured on a fine grid. Dimension reduction or feature selection is a key issue to make statistical methods most effective in functional data such as profiles and curves and estimating profiles can be considered as making inferences for infinite dimensional objects. We develop a new classification method for functional data which we shall call CARDS, standing for Classification After Reduction of Dimension with Smoothed clipped absolute deviation penalty. This proposed method is novel because it can be used for both prediction and feature selection by achieving sparsity at each step. More specifically, we want to keep as many nonzero coefficients as possible in the function estimation step yet with a sparse representation and achieving sparsity in the classification step for the classification purpose. Examples in proteomics will be presented.