

# Nonparametric modeling of heteroscedasticity in multi-dimensional regression

Kyusang Yu

*Konkuk University*

*E-mail: kysangu@konkuk.ac.kr*

**Abstract:** Generalized additive models provide a way of circumventing curse of dimension in a wide range of nonparametric regression problem. In this talk, we present a multiplicative model for conditional variance functions where one can apply a generalized additive regression method. This approach extends Fan and Yao (1998) to multivariate cases with a multiplicative structure. In this approach, we use squared residuals instead of using logtransformed squared residuals. This idea gives a smaller variance than Yu (2017) when the variance of squared error is smaller than the variance of log-transformed squared error. We provide estimators based on quasi-likelihood and an iterative algorithm based on smooth backfitting for generalized additive models. We also provide some asymptotic properties of estimators and the convergence of proposed algorithm. A numerical study shows the empirical evidence of the theory.