1145-62-1471 **Royal J Wang*** (rjwang@email.wm.edu), 4182 McCloskey ct, Chantilly, VA 20151, and **Daniel Vasiliu** (devasiliu@gmail.com), 4225 Teakwood Dr, Williamsburg, VA 23188. *Nonlinear Additive Modelling with Applications to the Assessment of House Prices.* Preliminary report.

Establishing a good framework for nonlinear inferences and modeling has been an ever-standing goal with great applications in functional data analysis and business analytics. The concept of generalized additive models in statistics was proposed by Hastie and Tibshirani and the main idea was stemming from the Kolmogorov-Arnold representation theorem; the argument was that any multivariate function could, in theory, be represented as sums and compositions of univariate functions. Introduced as an advanced regression technique, although with some simplifying assumptions, the idea of generalized additive modelling proved to be effective in various applications such as the valuation of houses or fixed assets, stock exchange, population dynamics, growth models and gene expression analyses.

We are considering both theoretical and practical aspects of the nonlinear additive models. Our aim is to study a new approach for obtaining a dictionary of functions that can be used to approximate the model and the challenge of dimension reduction along with a practical application to financial mathematics such as the analysis of the house data from Ames, Iowa. The practical goal is to improve the estimation of house prices given the fact that the data has a high dimensional feature space. (Received September 22, 2018)