

Abstract: Regression models have been the most basic tool in data science since Francis Galton developed it in the 19th century, where dependent and independent variables are real-valued univariate samples. We have an interest in extending a regression for real-valued variables to that for function-valued variables. Functional variables are random variables taking functions as their values. For example, spatial data can be seen as a functional variable that takes a function on \mathbb{R}^2 . We develop a functional regression model whose dependent and independent variables are functional variables taking L^2 functions on \mathbb{R}^2 . We propose a method to estimate parameters as an extension of popular OLS and demonstrate them with applications to US precipitation and temperature data. Let me notice that the model and methods are still in progress.