

Predicting Regression Probability Distributions with Imperfect Data Using Optimal Transformations

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ABSTRACT

The goal of regression analysis is to predict the value of a numeric outcome variable y given a set of joint values of other (predictor) variables x . Usually a particular set of x -values does not specify a repeatable value for y , but rather a probability distribution of possible y -values, $p(y|x)$. This distribution has a location, scale and shape, all of which can depend on x , and are needed to infer likely values for y given x . Regression methods usually assume that training data y -values are numeric realizations from some $p(y|x)$ measured with infinite precision. Often actual training data y -values are discrete, truncated and/or arbitrary censored versions of an underlying numeric y -value. Regression procedures based on an optimal transformation strategy are presented for estimating location, scale and shape of $p(y|x)$ as general functions of x , in the possible presence of such imperfect training data.

Bio: Dr. Friedman is a Professor in Statistics at Stanford University and is a member of the US National Academy of Science. He is a co-author of the popular text book entitled "The Elements of Statistics Learning: Data Mining, Inference, and Prediction". Dr. Friedman is one of the world's leading researchers in statistics and data mining. He has published on a wide range of data mining topics including trees, nearest neighbor classification, logistical regressions, boosting, and high-dimensional data analysis.