

Title: Linear Classifier Models for Binary Classification

Authors: Himchan Jeong (Department of Statistics and Actuarial Science, Simon Fraser University, himchan_jeong@sfu.ca) and Bin Zou (Department of Mathematics, University of Connecticut, bin.zou@uconn.edu)

Abstract: We apply a class of linear classifier models under a flexible loss function to study binary classification problems. The loss function consists of two penalty terms, one penalizing false positive (FP) and the other penalizing false negative (FN), and can accommodate various classification targets by choosing a weighting function to adjust the impact of FP and FN on classification. We show, through both a simulated study and an empirical analysis, that the linear classifier models under certain parametric weight functions can outperform the logistic regression model and can be trained to meet flexible targeted rates on FP or FN.