Thursday, February 23, 2017

Kennesaw Campus, Clendenin Building, room 3028 (CL 3028)/11:00am - 1:30pm

Michael McBurnett, Ph.D.
"Predictive Models with Explanatory Concepts"

ABSTRACT: The credit scoring and risk science industry has traditionally emphasized the construction of explanatory models. The conventional wisdom is that only such models satisfy relevant FCRA, ECOA Regulation B, and business rules requirements. We contend that the primary purpose of the model is its predictive ability to rank-order entities according to risk. This approach benefits both the institution accepting the risk (the customer) and the entity (e.g. the consumer). Predictive models may fall short on both regulatory requirements and customer approval; specifically the requirement to return "key factors" that adversely affects a score. These shortcomings often arise from modeling techniques that implicitly discover non-linear interactions between model inputs that are challenging, if not impossible, to interpret directly from the predictive model.

Credit attributes are correlated by nature, since each is some indicator of a consumer's financial behavior. Since the data is observational, there is no remedy to the situation. As such, models in general have been limited in predictive ability since by design, explanatory models do not allow for multicollinearity. We contend this view is both limiting and unnecessary. Regulation only requires key factors be returned and does not speak to the necessity of orthogonal predictors nor that reason codes are unique for each predictor.

First and foremost, model developers should be concerned with the models predictive ability. The only assumption needed is that observed multicollinearity is consistent across time. Second, developers must have methods to explain key factors driving the predictive model. We develop a satisfactory theory in this work termed Predictive Models with Explanatory Concepts. The theory is emphasized for logistic regression and neural network predictive models.

Biography

Michael McBurnett has 30 years of experience building mathematical models of human behavior in the credit risk, counterinsurgency warfare, intelligence, banking, direct marketing, political, and academic arenas. Mike holds a BS degree in Political Science from KSU. He also earned his Ph.D. from Washington University in St. Louis in Political Science. His major area was mathematical and statistical modeling, data collection, and analysis. His focus in business has remained in these three areas his entire career. He is a co-inventor of NeuroDecision™.