February 6, 2018

**Problem Set 2**

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INF 385T – Introduction to Machine Learning with Danna Gurari

Spring 2018

School of Information

3. Classification Models

Generative and Discriminative models follow different approaches to building the distribution. A generative model use the joint probability of all attributes when creating the distribution however a discriminative model applies conditional probability such that attributes are “given” other attributes. The generation of data plays an important role in the difference between the two models. Generative models use data generation to categorize the data to model the distribution of each class and thus usually work better on smaller datasets. Discriminative models just distinguish between the classes and therefore do not use data generation as a categorization metric. Hence, discriminative models end up making lesser assumption on the structure of the input than a generative model.

Example of both models:

Generative – Naïve Bayes – assumes conditional independence of the features

Discriminative – logistic regression – does not assume independence of the features