Components of a Network Learning System

In what follows, we will discuss the components of a network learning system. We will focus on classification problems such as churn prediction and fraud detection. However, note that these concepts can be easily generalized to a regression setting with a continuous target variable.

A first, important component is a non-relational (or local) classifier. This classification model uses only local (or node-specific) information. No network information is taken into account here. This model can be estimated using any of the techniques that were discussed earlier, such as logistic regression, decision trees, neural networks, random forests, and so on. Local classifiers are typically used to generate the priors for relational (or network) learning and collective inference.

A second component is a relational (or network) classifier. This classifier uses the network edges or links to make the classifications. Three types that will be discussed later are the relational neighbor classifier, the probabilistic relational neighbor classifier, and relational logistic regression.

A third component is a collective inferencing procedure. This procedure determines how the nodes are estimated together, thereby influencing each other.

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