Breast Cancer Diagnosis and Prognosis
Using Artificial Neural Networks

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Abstract

Breast cancer is an all-too-common affliction throughout the world, killing about 465,000 out of the 1.3 million women diagnosed annually [4]. Until a cure is found, diagnosis and prognosis of the disease are the most important tools available. Diagnosis and prognosis are classification problems, based on characteristics common to patients in different stages of the cancer. Artificial Neural Network algorithms have shown themselves to excel in classification. For this reason, I’ve investigated the efficacy of two ANN methods: Maximum Likelihood and K-Nearest Neighbors. To better understand their ability to predict breast cancer stages, I trained both methods using leave-one-out as an anecdotal analysis, and a randomly distributed, varyingly sized training set as a group analysis. The goal of my study is to compare these ANN methods’ abilities to predict individual cases, as well as groups of cases, to each other and to existing results found by Dr. Wolberg and his associates.