Domain: Disease Diagnosis Helper

Background:

Breast cancer is the most common cancer amongst women in the world. It accounts for 25% of all cancer cases, and affected over 2.1 Million people in 2015 alone. It starts when cells in the breast begin to grow out of control. These cells usually form tumors that can be seen via X-ray or felt as lumps in the breast area. Early diagnosis significantly increases the chances of survival.

The key challenges against its detection is how to classify tumors into malignant (cancerous) or benign(non cancerous). A tumor is considered malignant if the cells can grow into surrounding tissues or spread to distant areas of the body. A benign tumor does not invade nearby tissue nor spread to other parts of the body the way cancerous tumors can. But benign tumors can be serious if they press on vital structures such as blood vessels or nerves.

Machine Learning technique can dramatically improve the level of diagnosis in breast cancer. Research shows that experienced physicians can detect cancer by 79% accuracy, while a 91 %(sometimes up to 97%) accuracy can be achieved using Machine Learning techniques.

Problem Statement: Breast Cancer Classification/Detection using SVMs.

In this project, we plan to classify tumors into malignant (cancerous) or benign (non-cancerous) using features obtained from several cell images(test cases). Features are computed from a digitized image of a fine needle aspirate (FNA) of a breast mass. They describe characteristics of the cell nuclei present in the image. We plan to implement this using Support Vector Machines.