# AbstractID: 2110 Title: Influence of training methodologies on the performance of a mammographic mass CAD system

We have developed a computer-aided detection (CAD) system to identify masses in mammograms. The purpose of this research is to examine the effect of altering the training parameters on the system's performance. The CAD system consists of six stages: 1) filtration, 2) identification of suspicious regions, 3) segmentation of the regions, 4) extraction of features, 5) selection of a subset of the extracted features, and 6) classification; training is involved in the final two stages. The goal of the feature selection stage is to identify the subset of features that, when combined in the classification stage, best distinguish either masses from non-masses (the detection task) or malignant masses from other mammographic structures (the classification task). Specifically, we examine the effect of: training the system in detection versus classification mode, altering the system's initial sensitivities, including or removing regions on the skin boundary and/or chest wall, and limiting the maximum number of regions allowed in each mammogram. Finally, we determine if training the system with these different scenarios results in different "suspicion rankings" among the regions so that different scenarios can be combined, via logical combinations, to further reduce the false positive marks per image. System performance is evaluated using free-response receiver operating characteristic (FROC) analysis. The database employed in this study consists of 181 cranio-caudal view mammograms extracted from the Digital Database for Screening Mammography.