

AbstractID: 8564 Title: Computer aided diagnosis for breast calcification clusters: two-view approach

**Purpose:** To design, implement, and evaluate a computer aided diagnosis (CADx) algorithm for the benign/malignant differentiation of breast calcification clusters that uses features defined from both breast views recorded with either screen/film (SF) or full field digital mammography (FFDM). **Method and Materials:** Two sets of data were tested in this work. An SF set of 101 pairs of images consisting of CC and MLO views of the same calcification cluster and an FFDM set of 50 pairs. Regions of interest, 512x512 pixels in size, were selected on each view and centered on the calcification cluster of interest. Eight different experiments were conducted with the SFM set and one experiment is in progress with the FFDM data. The SFM experiments involved different methods of feature estimation from the two views, different sets of features, as well as a single-view based classification for comparison purposes. **Results:** On the single-view run, the classifier achieved an  $A_z=0.889$  with 88% sensitivity and 77% specificity at an operating point of 0.4; 12 features were selected as the most important. On the two-view dataset, the classifier trained only with CC-views achieved the highest  $A_z=0.968$  and a sensitivity=98%; 9 features were the most important in this case. When the average value of features from the two views was used, classification achieved an  $A_z=0.958$  with a sensitivity and specificity of 98% and 80% respectively. Combinations of features from the two views surpassed the average value classifier yielding an  $A_z=0.976$  with 96% sensitivity and 82% specificity. **Conclusion:** The combination of two-view information is instrumental in enhancing CADx performance but faces several challenges particularly in setting criteria for the optimum selection of features from the two views. Our method was transferred from film to digital without major modifications. FFDM results will be reported at the meeting.