AbstractID: 2843 Title: A New Nipple Detection Algorithm Based on Curvature

Purpose: Nipple is an important anatomical feature for mammogram registration and bilateral asymmetry analysis. We will investigate a new nipple detection algorithm based on curvature analysis.

Method and Materials: Nipple extends outward and changes the curvature on the breast skin-line. Curvature analysis will be proposed to locate the nipple in this study. The breast skin-line is first estimated by using a dependency approach. The skin-line is then smoothed by average-smoothing. Curvature is calculated along the skin-line boundary. The intersection point between the nipple and the skin-line is characterized by a large negative curvature. The nipple is thus located between two positions having the largest negative curvature values. The final nipple position is computed as the average of these two positions.
We have tested our algorithm on 26 mammograms with the extended nipple from the MIAS database.

Results: The proposed curvature-based algorithm correctly detects the nipple position in each image.

Conclusion: Our proposed nipple detection method is based on curvature analysis and performs well on mammograms with the outward nipples. The further work will be quantitative evaluation of the algorithm.