UNIVERSITY of HOUSTON
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Department of Electrical & Computer Engineering

MS Thesis Announcement

Computation of Ptosis from 3D Scans of Torso
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Ptosis is an important parameter for characterizing breast aesthetics and is frequently used for assessing the outcome of breast reconstruction surgery. It is a measure used for characterizing breast morphology that estimates the amount of sagging or drooping of the breast. It refers to the extent to which the nipple is lower than the inframammary fold (IMF; the contour along which the underside of the breasts attaches to the chest wall), and is clinically defined using the following scale. Grade 0 means no ptosis, grade 1 means minor ptosis, grade 2 means moderate ptosis, and grade 3 means major ptosis. Current clinical assessment of ptosis involves qualitative visualization by the surgeon and is subject to intra- and inter-operator variability. Anthropometrically, ptosis can be measured using the Regnault classification, wherein ptosis grade is determined by visually estimating the position of the nipple relative to the IMF. Although succeeding studies, extended the Regnault classification to include numerical values to quantitatively categorize the ptosis grade, these approaches are prone to error, especially due to the ambiguities associated with differentiating between the higher ptosis grades. Alternatively, ptosis can be measured from clinical photographs by computing the position of the nipple relative to the IMF. With recent advances in 3D technology, stereophotography is now finding its niche in clinical breast surgery and in this study we investigated and evaluated the utility of parameters such as surface curvature, coronal projection and surface normal for the assessment of ptosis from 3D images. Our analysis suggests that 3D features are successful for objective categorization of ptosis grades, with high accuracy and precision.

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