

Nose tip region detection in 3D facial model across large pose variation and facial expression

ABSTRACT

Detecting nose tip location has become an important task in face analysis. However, for a 3D face model with presence of large rotation variation, detecting nose tip location is certainly a challenging task. In this paper, we propose a method to detect nose tip region in large rotation variation based on the geometrical shape of a nose. Nose region has always been considered as the most protuberant part of a face. Based on convex points of face surface, we use morphological approach to obtain nose tip region candidates consist of highest point density. For each point of each region candidate, a signature is generated and evaluated with trained nose tip tolerance band for matching purpose. The region that contains the point which scores the most is chosen as the final nose tip region. This method can handle large rotation variation, facial expression, combination of all rotations (yaw, pitch and roll) and large non-facial outliers. Combination of two databases has been used; UPMFace and GavabDB as training data set and test data set. The experimental results show that 95.19% nose tip region over 1300 3D face models were correctly detected.

Keyword: Nose Tip Region Detection; Morphology; 3D Face Model; Point Signature; Tolerance Band