Human Hand Modeling from Surface Anatomy
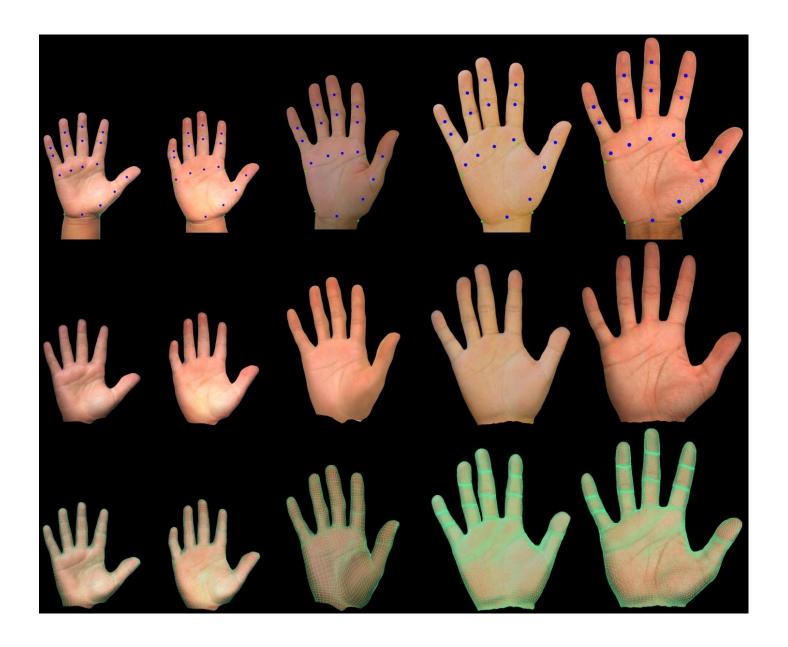
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The human hand is an important interface with complex shape and movement. In virtual reality and gaming applications the use of an individualized rather than generic hand representation can increase the sense of immersion and in some cases may lead to more effortless and accurate interaction with the virtual world. We present a method for constructing a person-specific model from a single canonically posed palm image of the hand without human guidance. Tensor voting is employed to extract the principal creases on the palmar surface. Joint locations are estimated using extracted features and analysis of surface anatomy. The skin geometry of a generic 3D hand model is deformed using radial basis functions guided by correspondences to the extracted surface anatomy and hand contours. The result is a 3D model of an individual's hand, with similar joint locations, contours, and skin texture.