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Estimating age and synthesising growth in children and adolescents using 3D facial prototypes

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Abstract

3D facial images are becoming increasingly common. They provide more information about facial form than their 2D counterparts and will be useful in future forensic applications. These include age estimation and predicting changes in appearance of missing persons (synthetic growth). We present a framework for both age estimation and synthetic growth of children and adolescents from 3D photographs. Age estimation accuracy was substantially better than for existing approaches (mean absolute error = 1.19). Our synthetically 'grown' images were compared to actual longitudinal images of the same cases. On average 75% of the head overall and 85% of the face were predicted correctly to within three millimetres. We find that our approach is most suitable for ageing children from late childhood into adolescence. The work can be improved in the future by modelling skin colouring and taking account of other factors that influence face shape such as BMI.

Keywords: Facial growth; age estimation; synthetic growth; missing persons