

Face Direction Estimation Using a Single Gray-Level Image

ABSTRACT

A method, apparatus, and computer program product for estimating face direction using a single gray-level image (110, 150) of a face are described. Given the single image (110, 150), a face direction can be determined by computing a nose axis (140, 180) maximising a correlation measure between left and right sides (120, 130; 160, 170) of the face. The correlation measure is computed by comparing one of the two sides (A) with another synthetic side (C) derived from the other side (B) using symmetry and perspective transforms. Optionally, this process can be accelerated using a contrast enhancement algorithm taking advantage of the circumstances that the nose is the part of a face reflecting the most light and that this reflected light is represented as a line-like region close to the real nose axis. The computation result is a word describing the spatial position of the face and combining height ("up", "normal", "down") and neck-rotation ("left", "frontal", "right").

FIG. 7