

A Local Invariant Generalized Hough Transform Method for Integrated Circuit Visual Positioning

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Abstract : In this study, an local invariant generalized Houghtransform (LI-GHT) method is proposed for integrated circuit (IC) visual positioning. The original generalized Hough transform (GHT) is robust to external noise; however, it is not suitable for visual positioning of IC chips due to the four-dimensionality (4D) of parameter space which leads to the substantial storage requirement and high computational complexity. The proposed LI-GHT method can reduce the dimensionality of parameter space to 2D thanks to the rotational invariance of local invariant geometric feature and it can estimate the accuracy position and rotation angle of IC chips in real-time under noise and blur influence. The experiment results show that the proposed LI-GHT can estimate position and rotation angle of IC chips with high accuracy and fast speed. The proposed LI-GHT algorithm was implemented in IC visual positioning system of radio frequency identification (RFID) packaging equipment.

Keywords : Integrated Circuit Visual Positioning, Generalized Hough Transform, Local invariant Generalized Hough Transform, ICpacking equipment

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