

In-Air Drawing by Hand (Fingers)

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The goal of this project is to capture the hands/finger movements in the air and extract the virtual drawing. In order to do so, the very first and most important step is to detect the hand/hands and fingertips in each frame of the video and then trace their movements and coordinates between different frames. Based on these coordinates, it should be fairly easy to extract the drawings.

For starter we make few assumptions to simplify this goal. The light intensity and conditions are staying the same throughout the frames. First goal is to identify the hand movement as a whole and after achieving that, detecting the fingertips would be the next step. Also the whole body stays relatively still while drawing with the hand. There are extensive methods and algorithms for hand detection and fingertip detection [1,3] like skin-color based technique and hand shape detector technique [2] which we are planning to utilize after more through analysis, based on our challenges and design criteria.

Some of the challenges are false detection of fingertips, identifying other parts of skin as a hand, hand occlusion, minor hand/finger movements that go undetected and etc.

This project will be not be implemented in Droid

[1] Lobo, N., "Open Hand Detection in a Cluttered single image using finger primitives" Computer Vision and Pattern Recognition Workshop, 2006. CVPRW '06. Conference on

[2] A.Mittal, A. Zisserman, P.H.S.Torr "Hand Detection using multiple proposals" British Machine Vision Conference, 2011

[3] Ankit Chaudhary, Kapil Vatwani, Tushar Agrawal and J.L. Raheja , "A Vision-Based Method to Find Fingertips in a Closed Hand" Journal of Information Processing Systems, Vol.8, No.3, September 2012