

# TANGIBLE PAPER

**Team : *Four\_HorseMen***

## Members

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## Description

In Short our project lets you use a paper as a digital screen and your fingers to navigate the pages on it.

In our project user wears a google cardboard and sees his surrounding through it and whenever a paper( or any surface ) having special markers on it comes in the view of the system, it detects the markers and overlaps appropriate tiles on it and it appears that one is seeing a digital paper. Also user Can navigate the tiles using his finger( with color markers on it ). Currently it is developed as news reading app but its possibilities are endless.

# ***Components Used***



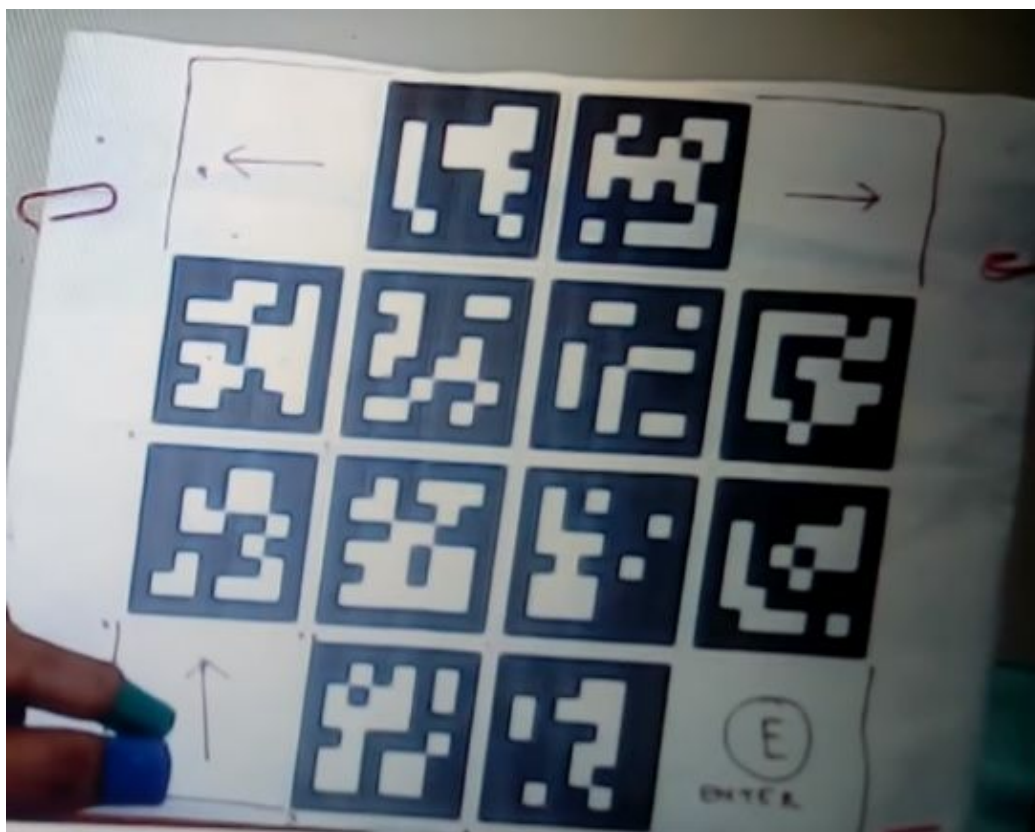
# ***Project Details***

To achieve its goal the smartphone attached to google cardboard records the surrounding by its back camera and sends it to a system connected on a local wifi network which runs the main Image Processing on the image ( i.e. recognising the markers and color marked fingers, pasting appropriate tiles on the image ) and then sends back the output image to the smartphone and the output image is displayed.

The markers are processed with the help of aruco module of OpenCV 3.1.0 .

News from different categories is taken from [www.reuters.com](http://www.reuters.com) and its webpage is processed with the help of libcurl and libxml libraries and then these news headlines are converted into images which are appropriately transformed according to perspective view of the marker before pasting.

Color marked finger detection is achieved by combination of various Image Processing Algorithms such as hsv conversion, histogram calculation, back projection, etc.



# ***Learning in Project***

- Socket programming and streaming of data over http protocol for communication of smartphone and system.
- Various Image Processing Algorithms for marker and color marked finger detection
- Converting web page into xml and parsing xml for news feed.

***GitHub Link :***

***[https://github.com/nilesh2797/ITSP-Four\\_Horsemen](https://github.com/nilesh2797/ITSP-Four_Horsemen)***

***YouTube Video Link :***

***<https://www.youtube.com/watch?v=VspE8qyBFIk>***

***THANK YOU***