AUGMENTED REALITY BASED TEACHING AND LEARNING

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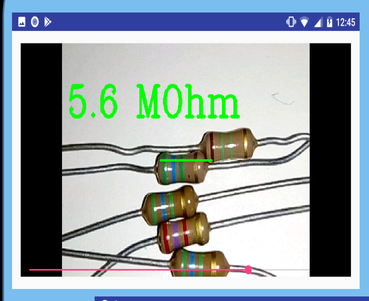
ABOUT OUR PROJECT: We have developed a mobile application that uses ‘Augmented Reality’ (AR) for explaining some of the core concepts in Computer Systems Engineering.

MOTIVATION: Engineering classrooms are deemed boring and inefficient due to the way information is presented to the students. [1]

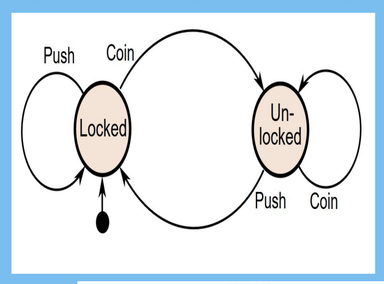
PROBLEM STATEMENT: To evaluate the effectiveness of AR in enhancing engagement to assist teaching methods and learning practices.

METHODOLOGY: We use a phone camera to detect an object/digital or electronic component enabled by the ‘OpenCV’ tool [2]. Object recognition is based on machine learning algorithms that help us match the desired object with the one being tracked by the camera. Once object is tracked, we overlay it with useful information, that can be viewed from the phone’s display.

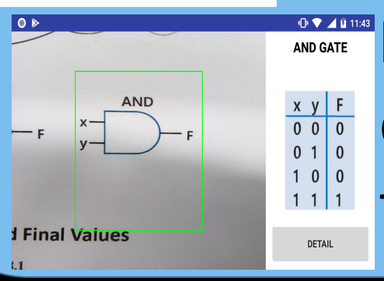
SCREENSHOTS SAVED (4): Features on our application



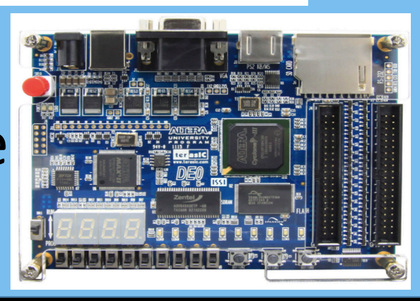
Resistor reader: It detects the colour bands of the resistor to calculate its value



FSM Simulator: Simulates the behaviour of an FSM after accepting user inputs.



Logic Gate Illustrator: It detects logic gates to provide transistor level descriptions



Component Recognition: Allows user to view component descriptions.

SUMMARY: Our research helped us understand how AR was used in different teaching disciplines. We further evaluated the benefits of AR and the importance of a robust implementation. Keeping these considerations in mind, we tried to develop a solution that explains some of the complex concepts we learnt with more clarity.

REFERENCES: [1] S. Freeman, S. L. Eddy, M. McDonough, M. K. Smith, N. Okoroafor, H. Jordt and M. P. Wenderoth, “Active learning increases student performance in science, engineering, and mathematics,”, pp. 8410-8415, 2014 [2] Android, OpenCV, Available: https://opencv.org/platforms/android/