Introduction

In the past few decades, continual improvement of the Internet technology has changed the ways of communication, working and learning. Some universities are trying to upload their courses on online education sites, for example edX and Coursera, to provide innovative learning experience. MobileLab can be viewed as a mini communication system to fulfill the need of conducting basic communications related experiments which overcomes the problems of time and location constraints. In our project, we will based on the web based MATLAB to build up the communication system.

Project Objectives

1. Provide laboratory session for online course students to provide practical learning experience
2. Replace the conventional laboratory session by MobileLab
3. Enhance the users’ experience by reducing the transmission time and improving the transmission accuracy

Design

The original approach to improve the user experience is splitting the video frame into half or even finer in order to send multiple bits in a single frame. However, users still have to hold their phone in front of their laptop during the transmission. By using the web based MATLAB, the role of mobile phone and the laptop can be interchanged. Because of the relatively high resolution of the phone camera, the frame can be downsized and packed in a single image which still can be decoded. The laptop monitor will act as a transmitter by displaying the image and accessing MATLAB with web browser. An Android app will be designed by us and run on the phone. It is responsible for capturing the photo and send it back to the online MATLAB server to complete the signal transmission.

Result

This figure shows the result of encoding method and it is not mature enough as there is no start and stop notification bits inside and we cannot demodulate the signal at this stage as we did not merge it with the app.

This is the Android app developed which allows user to capture the picture with a ‘Setting’ menu for users to set different configuration for their model of Android phone.