

## EE 368 Final Project Proposal

### Title: Instrument Display Readout

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#### The Problem:



Many scientific (or non scientific) devices do not have the ability to directly interface with computers. Instead, these devices rely on some sort of display to show what the device is reading/doing. Monitoring these readouts visually can be tedious and annoying and leave you without a historical record for future comparisons. The two images included above are samples devices in my own lab which I would like to be able to monitor.

#### The Solution

Due to frequent upgrades, I have multiple android phones which are doing nothing. For my project, I want to repurpose them as recording devices set up around my lab to take constant videos of instrument displays. These videos will then be processed and generate a log of the gauge readouts in the images. Here is a more specific description of the pipeline.

1. User sets up phone and opens app (either android phone, or possibly a webcam)
2. User selects and labels gauge displays that they want to be logged (digital character first, then analog [3] if time allows)
3. Phone records images, and does basic preprocessing (selection of frames, cropping or rescaling of images, etc.)
4. Images sent to Matlab server, where character recognition is done, possibly using [1][2](or analog read out is made)
5. Results sent to phone, or some other location and stored.

#### Comments

My final goal is to be able to use this practically in my own lab. At the most basic level, I want to have a web camera connected to a computer, and use Matlab to read and do the analysis on the characters. The next step will be to use an android camera remotely to acquire the images. Expanding this to work on a wider variety of gauges and displays will be next. I would also like this to be usable by others, without a huge amount of overhead. How to do this in the most stand alone and useful fashion will remain to be determined by the amount of work required by the previous steps.

[1] L. Neumann, & J. Matas, Real-Time Text Localization and Recognition

[2] X.-C Yin, Z. Yin, K. Huang, & H.-W. Hao, Robust Text Detection in Natural Scene Images

[3] D. Lima, G. Pereira, G. Vasconcelos, A computer vision system to read meter displays