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CIS 191 Project Writeup - Group 08

Project Idea

Our project was a dropbox photo sync system built on the pi. We broke up the process into the different sections which are explained below.

Pi Setup and Connecting to the Internet

Our pi was set up using an ethernet cable connected to a laptop. Using bash, a connection was set up to the pi, and a vncserver was installed. By installing vnc on our local machine, we were able to view the desktop of the pi, and program using the available GUI. Only a few times did we use the pi in detkin lab. Connecting to the internet was done using the sharing capabilities of the ethernet cable. Internet connection was shared with the pi through the local machine.

The External Camera and Taking Pictures

The pi camera was set up as shown by many tutorials online. However, the connector of the pi was broken over the course of the project. Many possible solutions were tried when dealing with this problem. After exhausting all of our options, finally the hardware was replaced, first the camera, then the pi itself. The new pi is the exact same model as the previous however the connector functioned on the replacement. The camera could be directed by hand, and the red LED on the camera was turned off for convenience.

Applying Filters and Python Libraries

The Python library we used for applying filters onto the images was pillow. This library offered an extensive selection of functions to choose from. Using this powerful library, we were able to create scripts for blurring and inverting the images saved by the camera. These scripts run on a crontab, and make sure not to interfere with each other. blurs of inverses and inverses of blurs should not exist. These files are uploaded to Dropbox automatically with the other files.

Dropbox Sync

After creating all of the photos and their respective filtered versions the next step was to sync them with the dropbox storage folder. We did this by first giving our pi both a gmail address and a dropbox account (cis191pi@gmail.com) so as not to clutter our own storage. Then we made our pi a developer and got both the api key and secret keys to connect with the dropbox endpoints. Using the python sdk we were able to create an authorize and upload python file. The authorize script will open a web browser for you to log in and give our app access then it will complete the OAuth flow and store your secret token in a dotfile. The upload file script checks a config file for your sync directory path, then checks the contents of that directory with the dropbox storage. It uploads the changes to match the local folder with the cloud.

Possible Use Cases

Perhaps walking around with a pi taking pictures and uploading them isn't what you would immediately describe as practical, but we thought there were a couple of useful scenarios where our pi could come in handy:

- You are in a forest looking for a specific animal so you rig a couple pis up to take pics and upload them so you can scope out the area remotely.
- You are photographing an event with a DSLR and you want to give people links to photos immediately after they are taken (you could use the upload scripts and the pi to facilitate this).
- You are headed to Europe on a month long vacation, but security cameras are so expensive and the files they produce are way too large; enter the Group 08 Raspberry Pi.

Video Link: https://vimeo.com/113474882