Lab Partner

Release v0.1

Darigov Research

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The low cost solution to manage experiment critical equipment

CHAPTER

ONE

INTRODUCTION

1.1 Motivation

Very often in labs you need to monitor a particular device which has an old seven segment display or the like that if it falls outside of a given parameter the experiment is no longer valid. This includes -80's that keep things cool and prevents degradation of samples and incubators which are needed to grow samples for a specified amount of time. The idea of Lab Partner is to have a Raspberry Pi with a USB camera pointed at the display and it uses Machine Learning to

1. read the display to monitor this range to either let you know that this situation has occurred to tell you that you need to start again or
2. to notify you as it happens so you can salvage your experiment before it is unsalvageable.

CHAPTER

TWO

BILL OF MATERIALS

2.1 Current BOM

Currently it only runs on the following

- Raspberry Pi 3 or newer
- Raspberry Pi Camera

2.2 Coming soon

- Having a modular 3D printed system in order to be able to mount the Pi and camera to the device that it is monitoring.

CHAPTER

THREE

INITIAL INSTALLATION

3.1 Setup

Clone the repository into your `home` directory

```
git clone https://github.com/darigovresearch/Lab-Partner.git
```

Go into the folder that was just created

```
cd Lab-Partner
```

On a Raspberry Pi, depending on the image you're using the python package manager pip may not be installed.

Installing pip:

```
sudo apt install python3-pip
```

Upgrading pip (needed for opencv):

```
pip3 install --upgrade pip
```

If you use environments you can set one up to prevent clashes of installation with other projects.

To create an environment:

```
python3 -m venv env
```

To activate the environment:

```
source env/bin/activate
```

Install the requirements

```
pip3 install -r requirements.txt
```

Run the app:

```
python3 App/app.py
```

Now you can navigate to the local URL which can be found on http://0.0.0.0:8765/ or http://localhost:8765/

You may need to enable Raspberry Pi Camera if you've chosen to use one

```
sudo raspi-config
```

Test camera accesses

```
raspistill -o test.jpg
```

3.2 Housekeeping

Make sure if this is a fresh installation to update the default password. This is done by running the following command and following the onscreen prompts. Make sure it's memorable, secure and login again immediately afterwords to ensure the update has taken place. *passwd*

CHAPTER

FOUR

USING THE SOFTWARE

4.1 Opening the page

If you have followed the instructions in Initial installation now you can navigate to the local URL which can be found on http://0.0.0.0:8765/ or http://localhost:8765/

4.2 Changing settings

You can then set the settings for how often you wish for readings to be set or if you want to temporarily stop taking readings.

4.3 Previewing Data

You can see a table of photos, when they were taken and what the reading was.