2021-10-19

Preliminary Report Outline:

## Introduction

* Uav flat ground detection
* Classify between flat and non flat ground

## Theory

* 2d image classifier
* What cost function we want to use? (cross-entropy, etc)
* 64x64 (possibly 3 channel?)
* Image resizing
* Image splitting
* Include regularization lambda
* Fusion layer?

## Algorithm

* Software description (code snippets, flow charts, figures) of how the theory is executed
* Refer to online tools used for image splitting (screenbud, pinetools, etc)
* Python script to split images
* Image resizing algorithm
* Renaming scripts and dataset creation tools
* Discus how we want to do vectorization/dimension reduction
* Histogram of images for brightness and average color
* TODO: look into useful metrics for 2d image dataset

## Results and Discussion

* All discussion about the dataset here
* Shortcomings/biases introduced during dataset creation
* How many images we ended up collecting?
* Discuss resizing artifacts
* (depending on progress) discuss and show code snippet for the vectorization/dimension reduction
* Start with simple network (64x64 gray single channel) and introduce further optimizations (dimension reduction if slow, more channels/image preprocessing if inaccurate)
* Use confusion matrix to determine accuracy

## Conclusions

Meeting discussions

* Gradient descent for cost min
* 0-1 for cost functions (cross-entropy)
* Python-Opencv for images
* Include regularization lambda
* Confusion matrix for accuracy