

CSC 310 Final Project Proposal

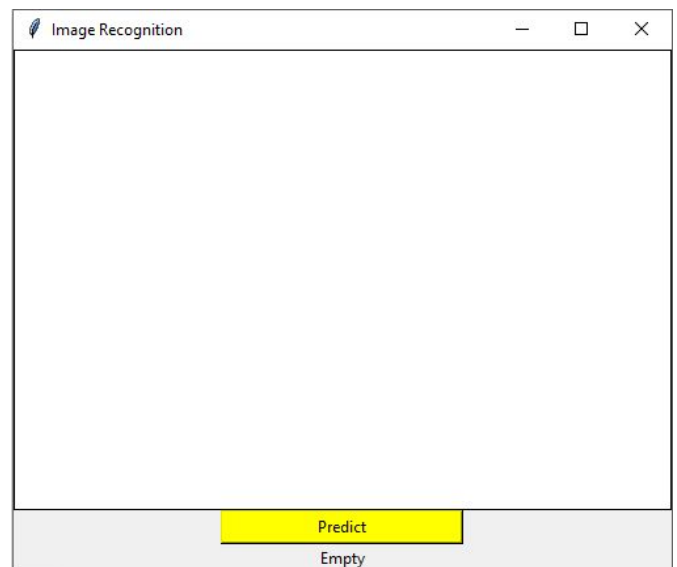
Team Members and Responsibilities

- Korakot Santiudommongkol - Interface, drawing feature
- Samantha Thornlimb - Finding the best model with our dataset

Project Idea

We plan on creating a digit recognition application. The idea of the project is that we have a GUI that we can draw on like a microsoft paint, the application will then take the drawn content of the GUI, and then do some image processing to match the image dataset we plan to use. The end product is we could draw any digit from 0 - 9 and the applications can correctly guess that digit.

Our proposed GUI would look roughly like this:
For where we will draw the digit would be the large top part with the white background. When we click the yellow predict button the application will save the drawn image as an image data, and use the data to predict the digit. The label that said “Empty” will be replaced with the predicted value.



Dataset

The data set we plan to use is the MNIST dataset, since the dataset on the original website is in a format we are not familiar with, we plan on using the csv version found in <https://www.kaggle.com/oddrational/mnist-in-csv>. For this data there is one label which is a number from 0 - 9 and 784 other columns which represents each individual pixel. This dataset stores one label and image pixel information for a greyscale 28x28 image. Each column has a number from 0 - 255, 0 being black and 255 being white.

Since there are a lot of columns in this dataset and all of the columns are similar, this is only a small portion of the dataset summary.

	label	1x1	1x2	1x3	1x4	1x5	1x6	1x7	1x8	1x9	...	28x19	28x20	28x21	28x22
count	60000.000000	60000.0	60000.0	60000.0	60000.0	60000.0	60000.0	60000.0	60000.0	60000.0	...	60000.000000	60000.000000	60000.000000	60000.000000
mean	4.453933	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.200433	0.088867	0.045633	0.019283
std	2.889270	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	6.042472	3.956189	2.839845	1.686770
min	0.000000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.000000	0.000000	0.000000	0.000000
25%	2.000000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.000000	0.000000	0.000000	0.000000
50%	4.000000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.000000	0.000000	0.000000	0.000000
75%	7.000000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.000000	0.000000	0.000000	0.000000
max	9.000000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	254.000000	254.000000	253.000000	253.000000

8 rows × 785 columns

Milestones

- Find the best machine learning model (Decision Tree, MLP, KNN) we could use for the data set and train our dataset and save our model to be used later.
- Finalize the interface (change the layout or change the entire interface)
- Implement drawing features on the interface.
- Implement code that saves drawn image to image data.

Basic Technology

- **Tkinter**: The GUI will be created using this library
- **ScikitLearn/ SKLearn**: we will be using this library for the machine learning model
- **PIL**: We need this library to grab the and process the image from our GUI