esther:

project outline : ()

Project Goal

* The main project goal is to implement a system which can translate the carpenters drawings into a digital instruction set.
* Convolution neural networks (CNN) and computer vision algorithm to detect engineering symbols on Timber(a carpenter's work piece) as shown in figure.
* Identify the symbols and the information it contains.
* Read cut-line dimensions
* Identify the piece which needs to be cut

Tools and resources:

Mention all the tools and resources we used for this project.

* Convolution neural networks (CNN)
* Computer vision algorithm(OpenCV)
* Tensor Flow
* Keras
* Colab platform
* VGG16

The handwriting recognition system

The system pipeline includes the following parts.

* Preprocessing
* Symbol recognition
* Digit recognition

Preprocessing part

Preprocessing of symbols

Edge detection

hsv color space

Gray scaling

Xianhao:

**symbol classification :**

standardization input

datasets(created by ourselves)

outcome images.

CNN model structures, Reason (2 layer, because the input image si simple, with black background and white contend, and there only 3 classes, so 2 layer is enough）

**digit recognition:**

standardization input

based on MINST

CNN model structures (3 layers, that we also tried the simpler one and more complex one, for the simpler one the accuracy is around 97% and it trained very quickly. As for the complex one, maybe it can give higher accuracy, but to train it that will cost a large amount of time, considering both the accuracy and training time, we chose this one which is pretty balanced.)

evaluation of the models : confusion matrix, recall rate, accuracy...

Arturo:

-model cannot generalize to other test images

-this is because the pre processing part values for masking the symbols and for the opening can fit only one image at a time. If there is even little noise left, the model recognizes it as a symbol and cannot work

-(show picture of final result and comment it)

-we could have avoided this problem by building a model that is able to overcome a little amount of noise in its input images by building larger datasets that include noisy pictures. However, this would have required a much greater amount of time, and goes therefore beyond the scope of this project

-we can then conclude that a CNN model, which was our choice from the beginning, might not be the best choice to develop such a project.

-heuristics??

-workplan discussion: we pretty much followed the workplan, however there was no time left to perfection the project’s other goals: code optimiziation, recognization of other colors

-group work was heavily limited because of absence of physical presence: this impaired our coordination