The initial algorithms consists of the following 4 steps.

First, read the image from the frontend's handwriting board.

Next, the image detection is divided into several parts, including:

1. Image pre-processing: Convert the image to grayscale, apply Gaussian blur, use the Canny edge detector to detect edges, and perform dilation and erosion operations.

2. Contour detection: Retrieve the contours in the image, calculate their area, extract the image of the region, and adjust the image boundaries to obtain the output image.

Both first and second step use the library *OpenCV*.

Then, use the pre-trained CNN model to classify the extracted image regions.

Finally, output the recognition results to the frontend for display.

We will use this algorithm to connect with the frontend of our project, to complete a basic programme with GUI to provide a completed, electronic devices based teaching software.