Project: AI Extended Model

Multi letter recognition from image

SUBMITTED BY:

Max Presley, MDS2000185, maxwell.presley@mds.ac.nz

19 06 2024

Brief Overview /Abstract

- ## Introduction and Background

The purpose of this project is to extend my previous project which was an app to practice writing letters for Koreans learning English. The project extends this by allowing the recognition of full words or multiple characters. This poses new challenges and development processes. I have an interest in Korean culture as far to have dedicated time to learn Korean each day. This makes the project space very interesting to me and I can translate some sentences myself to check validity

- ## Methodology

  - **Methodology:** I will use a CNN-RNN deep learning network with 16 layers. I will use only part of the dataset I have due to time constraints.
  - **Tools/Techniques:** The code will be done exclusively in Python. Jupyter Notebook will be the chosen IDE. Tensorflow will be used for the training.
  - **Pre-processing:** Preprocessing is a crucial step in getting good training results. Making the images more uniform is essential for consistency. Removing any NaN data needs to be done along with removing any images that are unrecognizable.

- ## Results and Evaluation

Using 10 Epochs I achieved an overall accuracy of 65%. I believe with more computing resources I could have achieved higher accuracy. I tried changing the dataset size and changing the training settings but either the training would be faster but very bad accuracy, or the training would take hours.

- ## Discussion and Conclusions

Overall, I processed and managed the data well. However, I was limited by time and hardware which resulted in a long wait times for training and low accuracy of making the predictions. I think I could have achieved a better accuracy if these issues weren't as prevalent. I was also unable to make a GUI for this. Regardless, I found I learned a lot about CNN networks during this time.

- ## References

IBM. (2023). *What are Convolutional Neural Networks? | IBM*. Www.ibm.com; IBM. https://www.ibm.com/topics/convolutional-neural-networks