

## **Project Proposal: Deep Writer**

### **Overview:**

Our project aims to train dataset of writer's handwriting to capture their writing styles. With the trained model, we can match a random piece of writer's handwritten text with the writer. In addition, given a non-writer's handwritten text, we output the writer with the highest similarity.

### **Goal:**

1. To implement the method for identifying writers mentioned in the paper [2] using Python and build the neural network in Keras.
2. Calculate the accuracy of the current methods without preprocessing the training data.
3. Adopt different methods for preprocessing the data and compare the accuracy rate.
4. Package the project into an iOS application to allow user input an image of their handwriting and the application will return the writer who has the highest similarity.
5. Possibly extend the language to Japanese, Arabic, Chinese, etc.

### **Specifications:**

1. Method: Use the proposed DeepWriter in [2], a multi-stream CNN, for extracting writer sensitive features. Adopt a patch scanning strategy to handle handwritten image with various lengths.
2. Dataset: We will work with the extensive IAM handwriting dataset [1], which includes 657 writers' handwriting samples, 1539 pages of texts, 5685 lines of sentences and 115,320 labeled words. We plan to train our model using 30 English writers and for future work, possibly work with texts in other languages.

### **References:**

- [1] "IAM Handwriting Database." IAM Handwriting Database - Computer Vision and Artificial Intelligence. Accessed April 02, 2018. <http://www.fki.inf.unibe.ch/databases/iam-handwriting-database>.
- [2] Xing, Linjie, and Yu Qiao. 2016. "DeepWriter: A Multi-Stream Deep CNN for Text-Independent Writer Identification." ArXiv:1606.06472 [Cs], June.
- [3] Bulacu, M., and L. Schomaker. 2007. "Text-Independent Writer Identification and Verification Using Textural and Allographic Features." IEEE Transactions on Pattern Analysis and Machine Intelligence 29 (4): 701–17.
- [4] Jain, R., and D. Doermann. 2011. "Offline Writer Identification Using K-Adjacent Segments." In 2011 International Conference on Document Analysis and Recognition, 769–73.
- [5] Yang, Weixin, Lianwen Jin, and Manfei Liu. 2015. "DeepWriterID: An End-to-End Online Text-Independent Writer Identification System." ArXiv:1508.04945 [Cs, Stat], August.