Learn the Way We Write: Automatic Adjustment of Handwriting Neural Classifier to Individual Users

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Abstract

In this paper, we consider improving convolution neural network (CNN) classifier of offline handwritten text. We focus on the style of handwriting each of the individual users, causing of its great variability and huge impact on the ability to successfully recognize written characters. We present fast, scalable and a no-retrain method for improving CNNs classifier. Using only basic machine learning techniques, such as K nearest neighbor classifier and K means clustering, we achieve up to +2.7% improvement in neural classifier precision, and get state of the art results on the dataset we use. We evaluate our method on two dataset: NIST Special Database 19 and ETH Zurich Deepwriting dataset.

1 Introduction

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2 Related work

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2.1 Previous work in offline handwritten character recognition

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2.2 Previous work in improving offline handwriting classifiers

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3 Method

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3.1 Method overview

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3.2 Clustering individual character writing styles

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3.3 Creating a writing history

Možda zaista usvojiti naziv 'dynamic writing history' za istoriju pisanja?

3.4 Using writing history

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4 Evaluation

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4.1 Used datasets

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4.1.1 NIST Special Database 19

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4.1.2 ETH Zurich Deepwriting Database

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4.2 Images preprocessing

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4.3 Datasets split

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4.3.1 NIST Special Database 19 split

pass Patrick et al. (2016)

4.3.2 ETH Zurich Deepwriting Database split

pass Aksan et al. (2018)

4.4 Base CNN classificator

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4.4.1 Architecture

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4.4.2   Training and results

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4.5   Evaluation results

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4.6   Comparison with relevant papers

Ovo možda u related works?

5   Conclusion

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References

Patrick, Grother & Kayee, Hanaoka (2016) NIST Special Database 19 Handprinted Forms and Characters, 2nd Edition

Aksan, Emre & Pece, Fabrizio & Hilliges, Otmar (2018) DeepWriting: Making Digital Ink Editable via Deep Generative Modeling In *SIGCHI Conference on Human Factors in Computing Systems*: CHI '18, ACM, New York, NY, USA