Batik Classification using ConvNet and Transfer Learning

Research progress report

Yohanes Gultom - 1506706345

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IKO61181 Advance Image Processing

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Overview

Research Proposal

- Batik image classification using ConvNet LeCun et al. [2015]

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- Accuracy comparison with:
    1. Convolutional stacked autoencoder (Menzata [2014])
    2. Direct SIFT descriptor matching (Willy et al. [2013])

Methodology

Figure 1: Classification with convolutional neural network
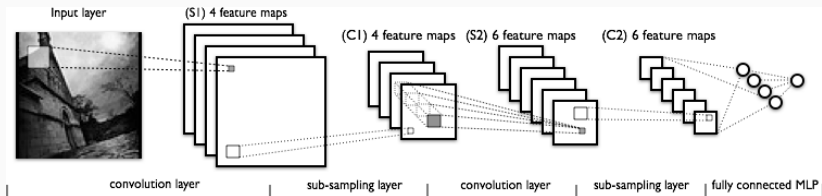
Figure 2: Convolutional neural network (source: `deeplearning.net`)
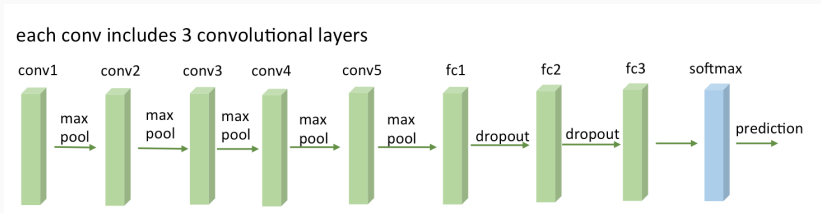
Figure 3: VGG-16 convnet (source: `sebastianraschka.com`)

Training Methods

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2. Transfer learning
   - Initialize convnet weights with the weights of pretrained model (eg. VGG16 VGG19, ResNet50, Inception v3)

Current Progress

Transfer learning with VGG16

- Preprocessing

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  - Resize, vectorization & normalization 603 images

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Transfer learning with VGG16

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  - VGG16 weight initialization
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  - Using stochastic gradient descent (SGD)
  - Cross-validation using 9:1
  - Only 5 epochs/iterations (12 hours onn CPU)
  - Bad accuracy of 57%
- Using Python (OpenCV, Keras + Theano) https://github.com/yohanesgultom/deep-learning-batik-classification

Remaining Works

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- Debug and tune architecture (increase epoch, adjust learning rate .etc)
- Do regular training (zero/random weights initialization)
- Run direct SIFT-descriptor matching on same data for comparison

References

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Thank you