Image's Motion Blur Detection

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Abstract

In this project, we address the problem of estimating motion blur from a single partially blurry image. We propose a deep learning approach to predicting the probabilistic distribution of motion blur at the patch level using a convolutional neural network (CNN).

Background

Preparation

Visual Object Classes Challenge 2010 (VOC2010)

PASCAL2
Pattern Analysis, Statistical Modelling and Computational Learning

Preparation

[[0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0],
[1, 0, 0, 1, 0, 0, 0, 1, 0, 1, 0],
[0, 0, 0, 1, 1, 1, 1, 0, 1, 0, 1],
[1, 1, 1, 1, 0, 0, 0, 0, 0, 1, 1],
[1, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0],
[0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0],
[1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1],
[0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0],
[0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1],
[1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0],
[1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0],
[0, 0, 0, 0, 1, 1, 0, 0, 1, 0, 1],
[0, 0, 1, 0, 0, 1, 1, 1, 0, 0, 0],
[0, 1, 1, 0, 1, 0, 1, 0, 1, 0, 0],
[0, 1, 1, 1, 1, 0, 1, 1, 0, 1, 1]]

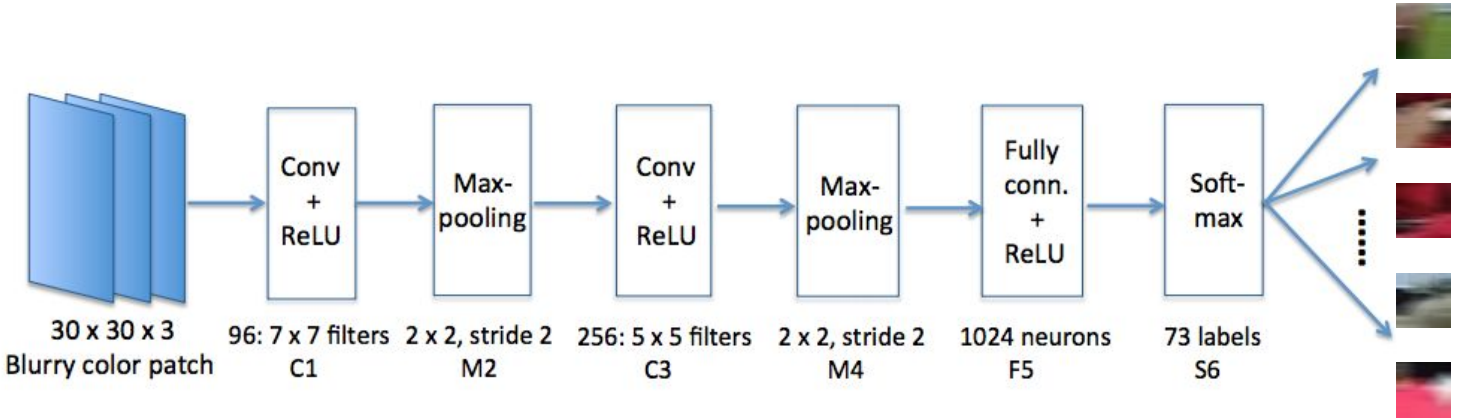
Learning a CNN for Motion Blur Estimation

Tools we are using:

Keras

TensorFlow

Learning a CNN for Motion Blur Estimation



Future work

Working on implementing CNN

In the future, this project could be extended from simple motion blur estimation to detecting blurry images with motion kernels. Finally and eventually, this project could be used to implement deblurring method based on how we detect motion blur.

Thank you so much for listening!

Credits

Core Algorithm: Sibo Zhu

Data Creation: Wenyang Zhang

Project Management: Karan Varindani