Vision, Optimization and Learning Group
Institute of Computer Graphics and Vision (ICG)
Graz University of Technology

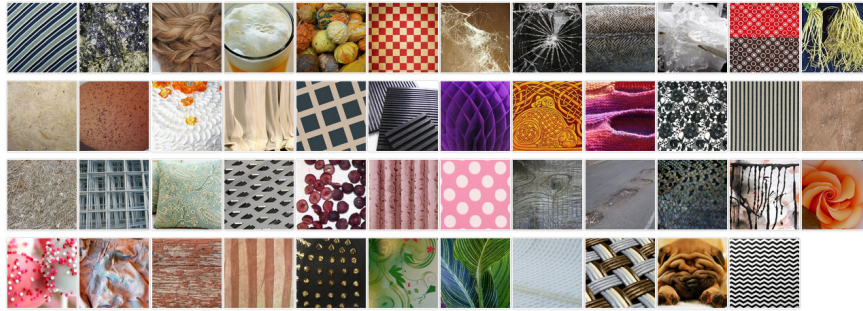# Texture Classification using learned Wavelets

Bachelor's Thesis/Masters' Project

Describable Textures Dataset (DTD)

https://www.robots.ox.ac.uk/~vgg/data/dtd/

Objective

Texture classification is a challenging task in computer vision. Modern approaches for texture classification of labeled data, such as the DTD, are using convolutional neural networks (CNNs). Wavelets are powerful bases functions, able to describe oscillatory and textural behavior of signals and images respectively. A recent publication by the VLO group has shown that wavelets can be learned from images. We want to integrate this approach into a method, fusing the information of both CNNs and wavelets, to improve the successful classification rate. In this work we want you to:

- Explore the possibility of classifying textures with learned wavelets
- Fuse learned wavelets into CNNs
- Try out different network structures

What we need

- Basic programming experience in Python
- Interest in numerical optimization or machine learning is an advantage

What we offer

- Gain hands-on experience in Numpy and Tensorflow (scientific computing/machine learning)
- Opportunity to be creative and experiment with different approaches
- Close collaboration with the researchers of the VLO group

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