Over the last years, deep matching has become a de facto standard algorithm for sparse motion estimation in computer vision. Although the name suggests otherwise, deep matching has only recently been implemented as a deep neural network with some success. By applying modern machine learning techniques one should be able to improve the performance of the original algorithm and could open up additional use cases for the method, for instance as a motion proposal generator.

Objective:

The aim of the thesis is to implement and improve the deep matching algorithm via learning a deep neural network. At first, you will setup a framework to replicate the basic algorithm. In a subsequent step different variants and extensions will be implemented and evaluated. Finally, you will integrate the created network in a conditional GAN (generative adversarial) or VAE (variational autoencoder) framework and investigate its capabilities as a smart motion proposal generator. A different option would be to extend the model to perform dense instead of only sparse matching.

Qualifications:

- Student of Information and Computer Engineering, Computer Science
- Basic knowledge in computer vision and optimization
- Programming experience in Python and/or C++.
- Optional: Neural network package e.g. Theano, Tensorflow, etc.

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