Project report

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In this project, we based on "Deep learning for hand gesture recognition on skeletal data" implement a hand gesture recognition model and several applications based on it.

Motivation and impact:

Human action recognition is a challenging but essential task in computer vision, with a wide range of potential applications, such as health care and military applications. Deep neural networks have shown promising results in this field and combining them with computational photography techniques can lead to exciting new possibilities. We chose this topic, to learn and implement natural human action recognition so that we can utilize it in the online e-commerce industry. Unlike poisson blending, human action recognition takes advantage of deep neural networks for extracting features from a source image, generating a blended image, and discriminating the blended image. It is robust for dealing with different human action and gaze directions. We hope to learn how computational photography techniques that we learned in CS445 can create values combined with deep neural networks.

Why did you choose this topic?

What is the more general importance or impact?

Approach: Describe how to achieve your results.

Results:

Explain your results and their significance. Unfortunately, our results indicate that our implementation of hand gesture is not very accurate.

Implementation details:

In this project, we use Jupyter Notebook and use following packages: sklearn, glob, numpy, pickle, ndimage, train\_test\_split, itertools, torch, sklearn.utils, time, math, PIL, torchvision.transforms, and tensorboardX.

Datasets: Dynamic Hand Gesture Recognition using Skeleton-based Features ,Quentin De Smedt, Hazem Wannous and Jean-Philippe Vandeborre, 2016 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW). Download from http://www-rech.telecom-lille.fr/DHGdataset/ and unzip into ./415-finalproject/dataset\_dhg1428

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Evaluation of the model:

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Challenge / innovation:

Describe what you think was challenging or innovative about your project. Explain the effort required to interpret unclear steps to a paper’s implementation or get a proposed new idea to work. Write and justify how many points you expect to receive for the challenge/innovation component of grading

Citation:

Devineau, Guillaume, Fabien Moutarde, Wang Xi, and Jie Yang. "Deep learning for hand gesture recognition on skeletal data." In 2018 13th IEEE International Conference on Automatic Face & Gesture Recognition (FG 2018), pp. 106-113. IEEE, 2018.