Optical flow estimation is one of the active and important research topics of computer vision. Recently, researchers have proven that optical flow estimation problem can be converted to a supervised learning task. With the help of convolutional neural networks (CNNs) the optical flow can be computed by two given input images end-to-end. In this work we propose a new approach to train the network using TensorFlow to investigate the possibilities of improving the performance. We choose the FlowNetS architecture as a reference network. Most of the hyper parameters were set as the original FlowNet paper recommended. Unlike the original FlowNet forming the training patch with two images and the ground truth optical flow, we also add the optical flow of the previous image pair. To train the network with these previous flow, we use the MPI Sintel dataset because Sintel is a dataset that contains sequential information.

We trained a network without previous flow to compare with the network with previous flow. In this work, we use the available data augmentation, such as translation, rotation, scaling and so on. Furthermore, in order to understand the impact of data augmentation on network performance, we also trained two networks without data augmentation.

For the network validation, we use the following datasets: Flying chairs, Middlebury, kitti and the validate set splitted from Sintel. The quantitative results are computed with AAE and EPE error metrics. For the kitti dataset, we also computed the Fl-all, Fl-bg and Fl-fg error. The quantitative results are 2.28 px (EPE) and 0,34 deg (AAE) for all datasets.

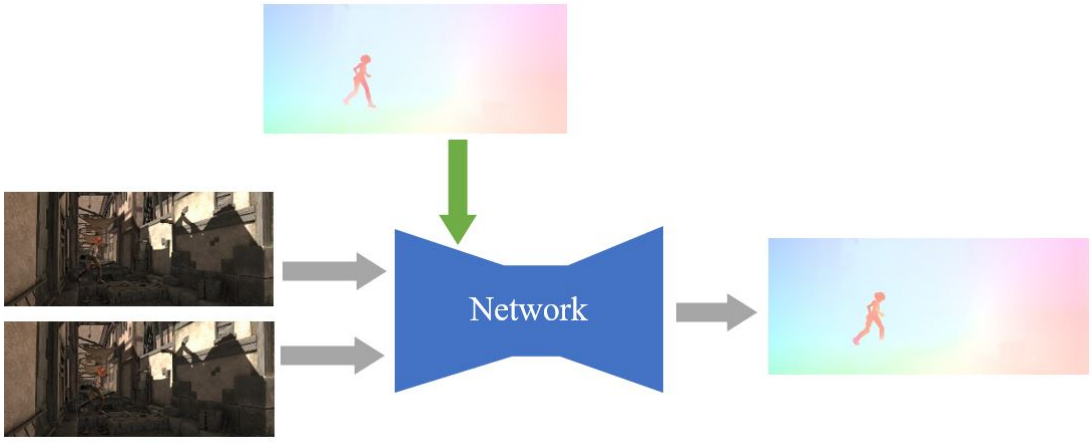

Figure: Adding previous flow to the training to improve the neural network