a. What means “filling-in” in the context of the method by Horn & Schunck and what are the benefits of this effect?

In regions where no information about the motion vectors is available, for example in areas with uniform intensity, the smoothness term of the Horn-Schunck Energy Function takes over and “fills in” the optical flow vectors of the neighbor pixels.

b. What would be the result if you add the full motion vectors instead of half of them?

In the first step we compute the motion vectors of two consecutive frames. If we then add the full motion vectors to the approximation of the second image we used in step one, and not the approximation of the frame in between of them.

c. Which line of code computes the first derivation in “opticalflow.m”? And what is the meaning of the chosen parameter values?

The call of the function “getDerivatives” computes the first derivation. The parameters have the following meaning:

alpha: regularization parameter for degree of the global smoothness, high alpha means high smoothness

iterations: number of iterations: if iterations is too big the runtime gets extraordinary long, if it is too low the precision isn’t good enough.