Alexander Shender 328626114

Vladimir Tchuiev 309206795

Technion - Israel Institute of Technology

I. Optical Flow Section

In Fig. 1 we present the optical flow for $t = 1$ and $N = 16$. The red arrows represent the optical flow for a section of 16×16 pixels. It is evident that only the moving cars between frames have optical flow; while the footage is noisy, the eigenvalue limit for $A^T A$ allows to filter that noise, even in the expense of ignoring some moving parts.

(a)

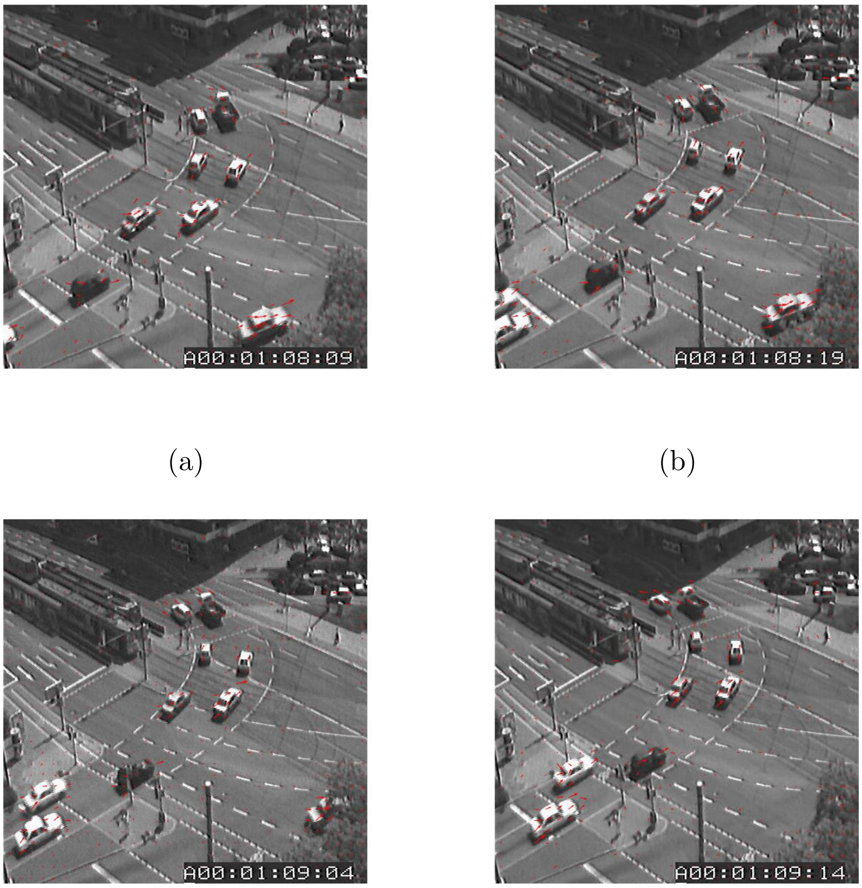
(b)

(c)

(d)

Figure 1: Optical flow for frames $k = 10, 20, 30, 40$ with parameters $t = 1$, $N = 16$.

By lowering the eigenvalue lower limit to $t = 0.1$ for Fig. 2, the optical flow is much more noisy and sensitive to the camera jitter, specifically note the roads in the figure.

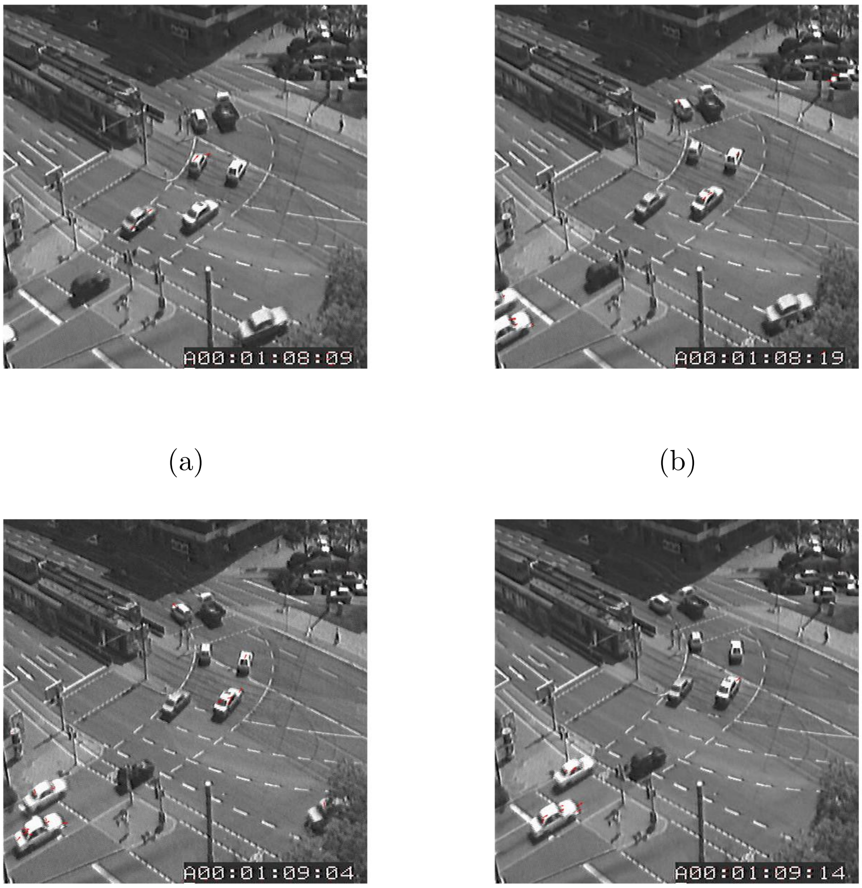


(a) (b)

(c) (d)

Figure 2: Optical flow for frames $k = 10, 20, 30, 40$ with parameters $t = 0.1$, $N = 16$.

Setting the parameter $N = 8$ increases the resolution of the optical flow segments, although with the cost of increased computational time and less data to work with per segment; increased resolution with optical flow requires a reduction in lower eigenvalue limit, as for smaller A matrices the eigenvalue tend to be smaller as well. In Fig. 3 the optical flow is filtered out, even legitimate sections with moving parts while in Fig. 4 the optical flow shows similar results to Fig. 1 although with higher resolution.



(a) (b)

(c) (d)

Figure 3: Optical flow for frames $k = 10, 20, 30, 40$ with parameters $t = 1$, $N = 8$.

(a)

(b)

(c)

(d)

Figure 4: Optical flow for frames $k = 10, 20, 30, 40$ with parameters $t = 0.1$, $N = 8$.