1.1

a.

$\frac{\delta W}{\delta pT} =. \begin{matrix} 1 & 0 \\ 0 & 1 \end{matrix}$

b.

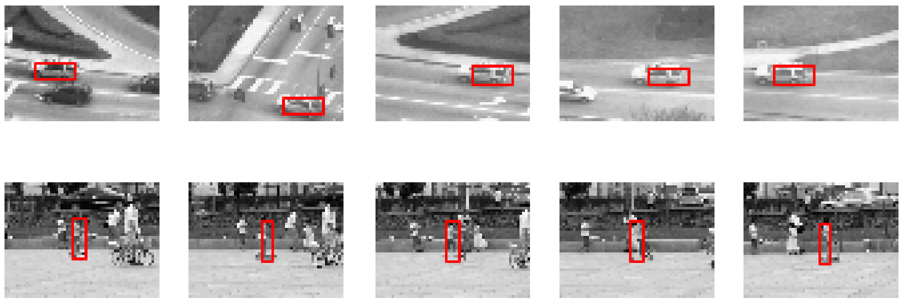
A= $\frac{\partial I(x\prime)}{\delta x\prime}\frac{\delta W(x;p)}{\delta P}$, where I=$I_{t+1}$

b=$T(x) - I(x')$, where T=I_t and I=I_{t+1}

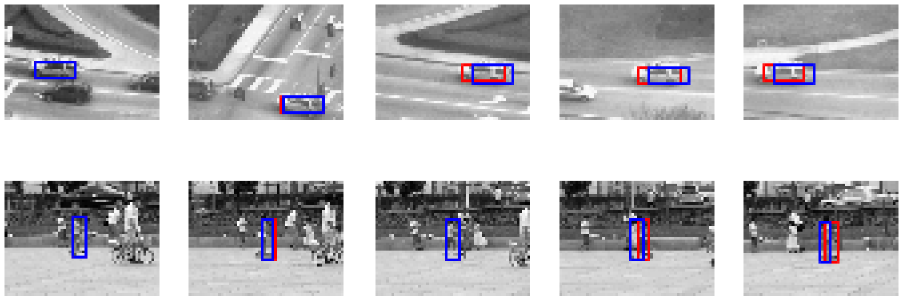
c.

$A^T A$ should be invertible and non-zero determinant

1.2

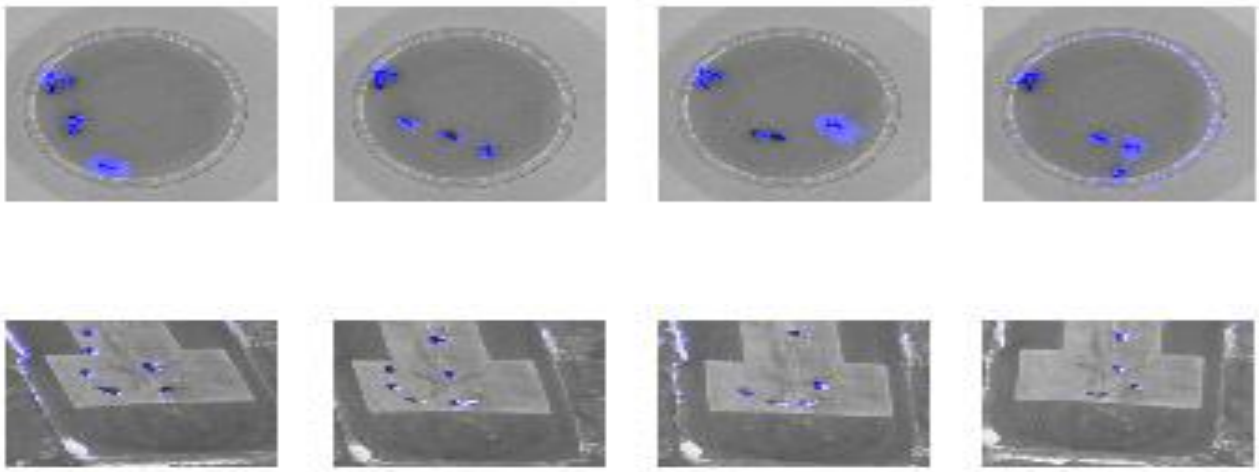


1.3



The red box shows the tracking after template correction and the blue box shows the original tracking.

2.2



3.1 Inverse compositional algorithm is more computationally efficient because unlike the forward additive algorithm, the computationally extensive quantities, the Hessian and the Jacobain are computed only once.

For the inverse compositional algorithm

A'=$\nabla T \frac{\delta W(x;0)}{\delta p}$

Where T = I_t and

The Jacobian, $\frac{\delta W}{\delta p}$ is computed only once at (x;0)

And the Hessian matrix can also be precomputed and stored and used for all the iterations.