Lucas-Kanade Solution

For all points $(k,l) \in W$: $I_x(k,l)u + I_y(k,l)v + I_t(k,l) = 0$

Let the size of window W be $n \times n$

In matrix form:

$$\begin{bmatrix} I_x(1,1) & I_y(1,1) \\ I_x(k,l) & I_y(k,l) \\ \vdots & \vdots \\ I_x(n,n) & I_y(n,n) \end{bmatrix} \begin{bmatrix} u \\ v \end{bmatrix} = \begin{bmatrix} -I_t(1,1) \\ -I_t(k,l) \\ \vdots \\ -I_t(n,n) \end{bmatrix}$$

A (Known) $n^2 \times 2$ | $\mathbf{u}$ (Unknown) 2×1 | B (Known) $n^2 \times 1$

n^2 Equations, 2 Unknowns: Find Least Squares Solution