3. <u>Modification in Horn-Shunck</u>

→ We will use L1 Norm in the Data fidelity term of $J(u,v)$ to minimize it, so as the decrease the affect of outliers.

$$J(u,v) = \iint \left(|I_x u + I_y v + I_t| + \lambda (u_x^2 + u_y^2 + v_x^2 + v_y^2) \right) dx\, dy$$

↳ in descrete form also.

→ Another way is, we can first use our conventional method to calculate for optical flow $(u_{K,\ell}, v_{K,\ell})$.

Put this value in data fidelity term

if $(I_x u_{K,\ell} + I_y v_{K,\ell} + I_t)^2 > \alpha$ (some threshold value α)

then we will discard $u_{K,\ell}, v_{K,\ell}$ at (K,ℓ) position and try the interpolate its value from neighbour

<u>Note</u>: Using this we can also find out the region in image where brightness constancy does not hold.

Ofcourse the value of α threshold will be depend on p% (given in ques.)

α decrease as p increases.

<u>Modification in Lucas-kanade</u>

→ We can also use L1 Norm here to minimize

$$J(u,v) = \sum_{i=1}^{N^2} |u I_{x_i} + v I_{y_i} + I_{t_i}|$$

→ And we can apply RANSAC here, in which we choose $(100-p)$ % of N^2 points in our RANSAC algorithm to calculate for u, v for that window. Apply same for all window.