

Global Flow

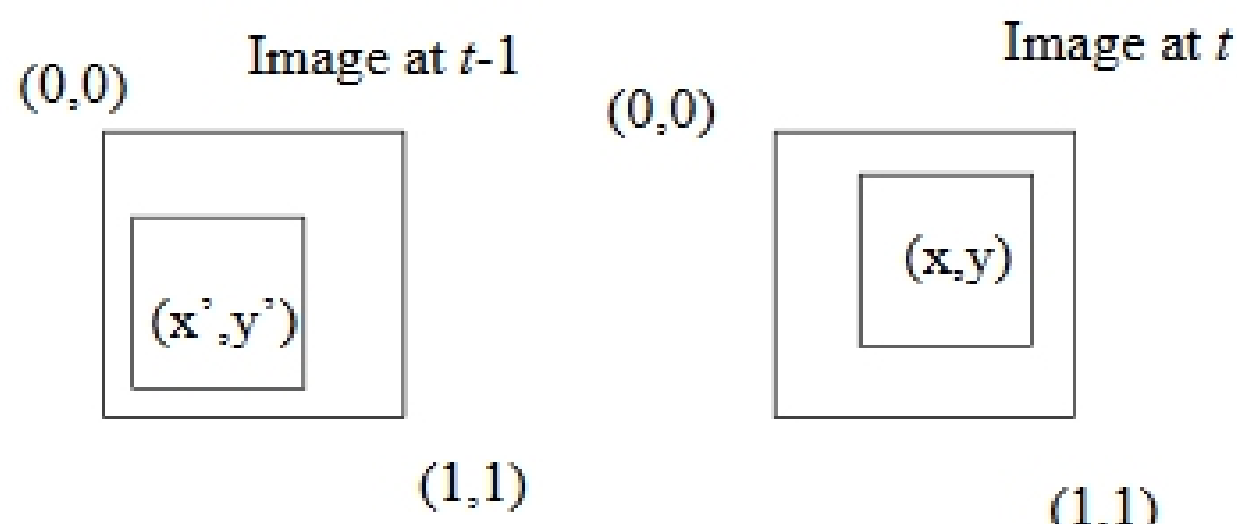
Anandan

Affine

Global Motion

- Estimate motion using all pixels in the image.
- Parametric flow gives an equation, which describes optical flow for each pixel.
 - Affine
 - Projective
- Global motion can be used to
 - generate mosaics
 - Object-based segmentation

Affine



$$u(x, y) = a_1x + a_2y + b_1$$

$$v(x, y) = a_3x + a_4y + b_2$$

$$U = X - X'$$

$$\begin{bmatrix} u \\ v \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix} - \begin{bmatrix} x' \\ y' \end{bmatrix}$$

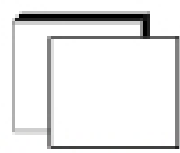
Affine

$$u(x, y) = a_1x + a_2y + b_1$$

$$v(x, y) = a_3x + a_4y + b_2$$

$$\begin{bmatrix} u \\ v \end{bmatrix} = \begin{bmatrix} a_1 & a_2 \\ a_3 & a_4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \end{bmatrix}$$

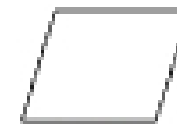
Spatial Transformations



translation



rotation



shear



Rigid (rotation and translation)



affine