Lecture-8

Feature-based Registration

Steps in Feature-based Registration

- Find features
- Establish correspondences between features in two images (correlation, point correspondence)
- Fit transformation
- Apply transformation (warp)

Features

- All pixels (spatiotemporal approach)
- Corner points
- Interest points
- Straight lines
- Line intersections
- Features obtained using Gabor/Wavelet filters
- …

Transformations

- Affine
- Projective
- Psuedo-perspective
- Rational polynomial

Good Features to Track

- Corner like features
- Moravec's Interest Operator

Corner like features

$$C = \begin{bmatrix} \sum_Q f_x^2 & \sum_Q f_x f_y \\ \sum_Q f_x f_y & \sum_Q f_y^2 \end{bmatrix}$$

Q is an image patch ⇩

Eigen Values

$$D = \begin{bmatrix} \lambda_1 & 0 \\ 0 & \lambda_2 \end{bmatrix}$$