

Geometric Transformation

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1 FEATURE MATCHING



Figure 1.1: Matching

Method Description.

1. SIFT descriptors. It has the good properties of uniqueness and robustness.
2. Two-way matching. Only keep those matching pairs where for either side the best fit is chosen.

2 GEOMETRIC TRANSFORMATION

In order to get the stable transformation parameters, both the Affine and Homography model use RANSAC.

From "IMG_1188" to "IMG_1203".

$$T_{affine} = \begin{bmatrix} 0.076704 & -0.133983 & 881.017646 \\ -1.379086 & -0.55412 & 2405.004454 \end{bmatrix} T_{homography} = \begin{bmatrix} -0.311293 & 1.976084 & 585.275757 \\ -1.14494 & 2.422748 & 1525.213227 \\ -0.000559 & 0.001968 & 1 \end{bmatrix} \quad (2.1)$$

From "IMG_1210" to "IMG_1211".

$$T_{affine} = \begin{bmatrix} 0.940104 & 0.008679 & 729.775935 \\ -0.062605 & 0.981735 & 106.207075 \end{bmatrix} T_{homography} = \begin{bmatrix} 0.463397 & -0.008695 & 896.801563 \\ -0.137731 & 0.813017 & 166.043916 \\ -0.000185 & -0.000008 & 1. \end{bmatrix} \quad (2.2)$$

From "IMG_1190" to "IMG_1195".

$$T_{affine} = \begin{bmatrix} 0.323779 & -0.028841 & 784.27115 \\ -0.053913 & 0.847798 & 49.523068 \\ -0.000207 & -0.000008 & 1. \end{bmatrix} T_{homography} = \begin{bmatrix} 0.827734 & -0.033269 & 573.994433 \\ 0.145547 & 1.095088 & -165.097678 \end{bmatrix} \quad (2.3)$$

3 IMAGE STITCHING

"IMG_1211" and "IMG_1218".



Figure 3.1: Affine



Figure 3.2: Homography

"IMG_1213" and "IMG_1210".



Figure 3.3: Affine



Figure 3.4: Homography

"IMG_1207" and "IMG_1209".



Figure 3.5: Affine



Figure 3.6: Homography

4 PANO STICHING



Figure 4.1: Affine



Figure 4.2: Homography