Restrict more algebraic (complex) search

be found since a search (usually) can be published more difficult (complex) search

Step (ii) allows for more and better (interest points to

Step (ii) usually involves minimization or LM, but

\( o \) Re-compute Interest points using Guided matching

\( u \) Re-estimate Spatial estimation of \( H \) for all images

\( i \) Apply RANSAC (Random Sample Consensus)

\( l \) Compute putative correspondences (e.g., NCC)

\( p \) Compute Interest points (e.g., HIC)

\( c \) Estimate Transformation

Robust Homography
How many outliers can it detect/discriminate?

Robust Line Estimation: 1. Select line: (x) Random

KAMSA
sample has no outliers for a given size of sample, and proportion of outliers, e.

Table 4.3. The number of samples required to ensure, with a probability of $p = 0.99$, that at least one

<table>
<thead>
<tr>
<th>Sample size</th>
<th>8%</th>
<th>5%</th>
<th>3%</th>
<th>2%</th>
<th>1%</th>
<th>0.5%</th>
<th>0.2%</th>
<th>0.1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1177</td>
<td>22</td>
<td>17</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>888</td>
<td>16</td>
<td>13</td>
<td>10</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>589</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>293</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>166</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Proportion of outliers:

\[
\sigma_N = \frac{(1-p)}{(1-(1-e^(-\frac{0.99}{N}))}
\]

\[
N = \frac{\ln(1-p)}{\ln(1-(1-e^{-0.99}))}
\]

Selections (each of 5 points) are required, where

\[
\text{Outliers} = 1 - \frac{N}{E}
\]

If $E$ is the probability $x$ is an outlier,

\[
\text{Probability} = p = 0.99
\]

An arbitrary number of points is free of outliers. P of that one of the random samples with

We need no samples to guarantee our probability.

\underline{Number of samples:} unnecessary to use all samples.
Choose H or G based on # of indices |

\[ \text{C} \geq \text{D} \quad \text{(i.e. D > 1/3\sqrt{N})} \]

3) Compute the # of indices consistent w/ H

Partitive Correspondences

2) Compute the distance dL for all other and compute N (homographic) \( (L = 4) \)

1) Select a random sample of N correspondences

Given the allocation for N above

Algorithm: Allocation: (step iii) or Homomorphic algorithm

1. Increment sample_count
2. Set V as above
3. Set \( e = \frac{1}{1 - \text{(#inliers)/total number of points}} \)
4. Choose a sample & count # inliers
5. While \( N \geq \text{sample_count} \)
6. \( N = \infty \) ? Sample_count = 0

See N: Allocation: N = 0 \( \Rightarrow \) Sample_count = 0
\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

Note: If the row and column are symmetric, then we can write as we did in.

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]

\[
\begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} = \begin{bmatrix}
0 \\
-1 \\
1
\end{bmatrix} \iff \text{(Direct Linear Transform)} \quad A \neq 0.
\]
Corners (i.e., 3 of 4)
can guarantee they are not
Note: 4 pts are sufficient if you

\[ \begin{bmatrix}
  y_1 \\
  y_2 \\
  y_3 \\
  y_4
\end{bmatrix} \]

is the last column of

\[ (A^T V A) \]

vector of \( A = V U^T \)

since \( \Sigma \) is the (column) null

\( A \) is \( 8 \times 9 \) which is still \( G \)

\( \) of equations.

\[ \begin{align*}
\text{Note: 4 corresp. points } & \rightarrow \ 8 \times 9 \text{ system } \\
\text{corresp. points gives 2 rows. } & \text{ if we}
\end{align*} \]

\( \) to solve for \( \frac{1}{a} \) each

(\text{cont})
\[ n = \frac{q (1 - q)}{q (1 - q) / \left(1 - (1 - e) v^2\right)} \]

\[ e = \text{tmp} ; \]
\[ e = e - \text{tmp} ; \]
\[ \text{tmp} = 1 - \text{current-max} \]
\[ \text{Length} (\text{Coarse-Points}) ; \]
\[ \text{Initires} \]
\[ \text{current-max} = \text{Length (Initires)} ; \]
\[ \]
n = # of integers after commas (e. the end for Pianch H)

n = 4 in \text{reference to estimation (or scale 5 & 6)}

and in parts of corresponding points, where:

1) Comp - Homog ( ) - this function computes the

Kovariability. H, using JLT change (scale 5 & 6)

2) This step is "optimal" if you opt to use steps

Be "smarter" when applying this to "full 3 out of 4"

(0 \leq c \leq 1) \quad \text{and} \quad (a-b) \boxtimes (a-c) \geq 0

(0 \leq a \leq b) \quad \text{and} \quad (a-b) \boxtimes (a-c) \geq 0

\text{or 3) } \quad \text{for } \theta = \pi \text{ and so on...}

\text{in all 3 out of 4 points. You could use:}

\text{there are "smarter" ways to check collinearity.}

\text{co-linear \rightarrow co-linear points. Good to singular H.}

Notes: 1) the 4 pairs are "good" if they are not
So, instead: \( x' = \frac{x}{y} \)

If it is not: \( x = \frac{y}{x} \)

\[ \left[ \begin{array}{c} x' \\ y' \end{array} \right]_{\mathbb{R}^2} = \left[ \begin{array}{c} 1 \\ 0 \end{array} \right] \quad \text{or} \quad x' = \frac{y}{x} \quad \text{or} \quad \sqrt{\frac{y}{x}} \]

Remember: \( y = \frac{x}{x'} \)

That all integers are within \( r = \sqrt{\frac{y}{x}} \)

That would guarantee an arbitrary probability of integers or outcomes. In other words, guarantee an arbitrary \( a \) for the distribution to calculate the number of outcomes that would update a linear function. Instead, you would be very careful here! You do not want to calculate disturbance (3)
In case someone wants to synthesize some data to test their algorithm, a homography can be decomposed as:

\[ F = x(R + t n) \]

where:

- \( d = \) distance of \( T \) to \( C \)
- \( n \) = normal vector of plane \( C \)
- \( R \) = rotation between cameras \( C \& C' \)
- \( t \) = translation of \( C \) w.r.t. \( C' \)

\( T \) can be obtained in this way.
Comments on NW2

1) contracts / slang / colloquial
2) explain variables in eq.
3) divide report into: intro / approach / test / results
4) code as appendix
5) clear notation
6) spell check
7) edit equations
8) add caption to figures & cite figures in text
9) left (center = 0 Right) / epipole
10) can't solve for x y z coord. of epipole
11) assignment was for clicking on both sides.