- How to estimate E using 5 point algorith?

We start of in the same manner...

$E = R[t]_x \quad x_n'^T E x_n'' = 0$ for points $0 \ldots n$.

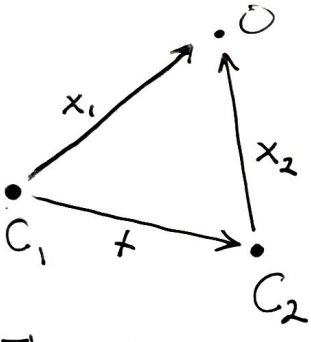
*Note that these x_n points are calibrated, $x_n = K^{-1} x_{un}$

x_{un} = uncalibrated point.

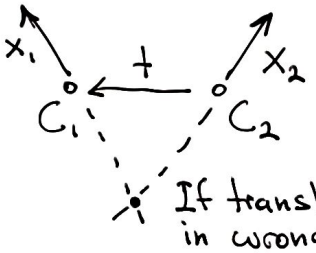
$$\begin{bmatrix} x_n', y_n', c' \end{bmatrix} \begin{bmatrix} E_{11} & E_{12} & E_{13} \\ E_{21} & E_{22} & E_{23} \\ E_{31} & E_{32} & E_{33} \end{bmatrix} \begin{bmatrix} x_n'' \\ y_n'' \\ c'' \end{bmatrix} = 0$$

, where C is a camera constant.

- Singularity of F also holds true for E, $\det(E) = 0$.
- Instead of 8, we only require 5 points.
- Its common to use 5 point algorith with RANSAC to remove outliers.



The above is what we are trying to find.



If translation is in wrong direction we find that points X_1 and X_2 meet at the back.

- As you can see we must make sure to find the right solution. We need to make sure that both C_1 and C_2 are looking in forward direction and that point O is intersected by both points x_1 and x_2.

We assume $\Sigma = \begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{vmatrix}$ meaning a noise free essential matrix.