

decomposecamera - Decomposition of a camera projection matrix

Usage: `[K, R, C, pp, pv] = decomposecamera(P);`

P is decomposed into the form $P = K[R \ -R*C]$

Input: P - 3 x 4 camera projection matrix

Output:

K - Calibration matrix of the form

$$\begin{bmatrix} ax & s & x0 \\ 0 & ay & y0 \\ 0 & 0 & 1 \end{bmatrix}$$

Where:

ax = f/pixel_width and ay = f/pixel_height,
x0 and y0 define the principal point in pixels,
s is the camera skew.

R - 3 x 3 rotation matrix defining the world coordinate frame
in terms of the camera frame. Columns of R transposed define
the directions of the camera X, Y and Z axes in world
coordinates.

C - Camera centre position in world coordinates.

pp - Image principal point.

pv - Principal vector from the camera centre C through pp
pointing out from the camera. This may not be the same as
 $R(:,3)$ if the principal point is not at the centre of the
image, but it should be similar.

See also: RQ3

Reference: Hartley and Zisserman 2nd Ed. pp 155-164

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November 2013 Description of rotation matrix R corrected (transposed)