Vision Based Navigation Assignment 3

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Exercise 2

Points \boldsymbol{x}_L and \boldsymbol{x}_R from a stereo camera (considered in a two view case) are related as:

$$egin{aligned} \lambda_R oldsymbol{x}_R &= oldsymbol{X} \ \lambda_L oldsymbol{x}_L &= oldsymbol{R} oldsymbol{X} + oldsymbol{T} \ \lambda_L oldsymbol{x}_L &= oldsymbol{R} \lambda_R oldsymbol{x}_R + oldsymbol{T} \ \lambda_L oldsymbol{\hat{T}} oldsymbol{x}_L &= \lambda_R oldsymbol{\hat{T}} oldsymbol{R} oldsymbol{x}_R \ oldsymbol{x}_L^T oldsymbol{\hat{T}} oldsymbol{R} oldsymbol{x}_R &= 0 \ oldsymbol{E} &= oldsymbol{\hat{T}} oldsymbol{R} \end{aligned}$$

where λ_R and λ_L are respective projections to 3D, R is rotation and T is translation from x_R to x_L .