Exercise in Motion Estimation

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This is the first half of exercise nine in 02504

In this exercise you should estimate the 3D motion of a ping pong ball from stereo images there off. The data to do this should be found in `Ex9_PingData.mat`, which contains

- BaseL and BaseR, which are base image from the left and right images respectively. I.e. images without the ping pong ball.
- ImL and ImR, which are sequences of 24 images from the left and right images respectively.
- CamL and CamR, which are the left and right camera matrices respectively. The coordinate of the ping pong ball in the first left image is ca. $[248, 3221]^T$.

The images are kindly supplied by Haiyan Wu and Nils Axel Andersen – Thank you!

Your tasks are

1. Detect the ping pong ball in each of the 24 image pairs. Hint: use background subtraction.
2. Write a function for doing 3D point triangulation, from camera matrices and 2D points - via the linear algorithm.
3. Based on your tracked ping pong ball from 1. find the 3D position of the ping pong ball for all 24 images, and make a 3D plot. Useful functions are `plot3` and `cameratoolbar`.