Visionaries Final Project
Description
Find a reference image within a scene and estimate the pose in real time.

Using the pose estimate we can draw a rectangle around the found object indicating the pose.

The pose is calculated using DLT and RANSAC.

Using the camera intrinsics we can calculate the rotation and translation and display a 3D object above the found object.
Roadmap
• 17.06.2014 : Kick off

• 24.06.2014:
  - Matching between camera image and pre defined image to get the 2D-2D point correspondances
  - Implement Direct Linear Transform to calculate the homography matrix

• 01.07.2014:
  - Implement RANSAC for calculating a robust homography matrix with small error
  - Display outline of matched object using the homography. E.g. green lines are drawn around one object
• Till 08.07.2014:
  – Not done: Match multiple different objects and draw different coloured outline
  – Instead:
    • Make it more robust
    • Implement window matching
Result
Problems
• Robustness
  − Initially the object was not found often in the scene
  − Sometimes it was detected, sometimes not even if the object was not moved
  − Tried: Symmetric matching, window matching, changing the parameters of descriptors, different descriptors (ORB, BRISK)
  − Solution: RANSAC
    • Subset-Samples were not drawn correctly
    • Sample duplicates in the subset
    • Using std::random_shuffle on correspondances and take a subset of the shuffled set
Live Demo
Thank you for your attention