

Object Measurements via reference

William Castillo

wcastil@stanford.edu, ID:05772665

Introduction:

Computing real world measurements such as height or width from images is a common problem that can be solved in different ways. The difficulty lies in the reconstruction of scale and one way to recover this is by using a reference object of known dimensions. This project aims to provide real time measurements through the viewport of a mobile device, using a reference object for scale reconstruction.

Technical Details:

Scale reconstruction will be achieved by placing an object with known dimensions in the scene. The object will be something common such as a piece of paper or a credit card. The application will then detect the reference object. Using the known dimensions of the detected reference object, the application will compute the pixel ratio. This measurement will allow the application to compute the real world measurements of other objects in the scene. Initially, the reported measurements will be of lines that are detected but this could be expanded to other identifiers such as features or user selected regions.

The ideal result will be a viewport that highlights edges with a drawn line and text with the real world measurement. This will adjust in real time as long as the reference object is in scene and at the same depth.

The target platform will be Android and development will be done with the NVIDIA Tegra 2 tablet.

Milestones:

- Milestone 0: Create Android project
 - Add menu bar with ability to take photo annotated with measurements
 - Add viewport
- Milestone 1: Reference object recognition
 - Detect the reference object
- Milestone 2: Compute reference
 - Compute pixel ratio with reference object
- Milestone 3: Edge detection for objects to be measured
 - Detect edges in scene
- Milestone 4: Calculate and display measured objects
 - Convert measured pixels to real world measurements
 - Display result on viewport
- Milestone 5: Finalize
 - Clean up code

- Test application in multiple environments
- create installable apk