# Real-Time Scalable Edge-Based Object Detector
## Android (Mobile & Google Glass), C++ code (ROS package)

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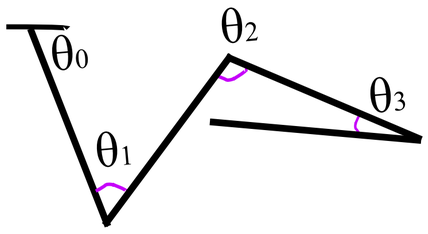
## Overview

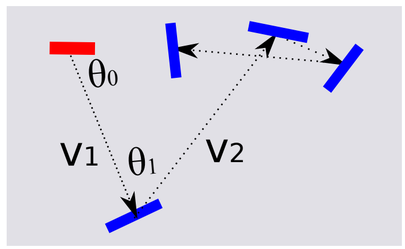
- Edge-based 3D object learning and detection
- Tractable extraction of edgelet constellations using paths
- Paths are selected from a pool of paths based on their ability to find constellations in training images.
- Transformation-invariant descriptor
- Library lookup (geometric hashing)
- Generative and real-time learning of views
- Light-weight method. Ported to Android (Mobile & Google Glass)

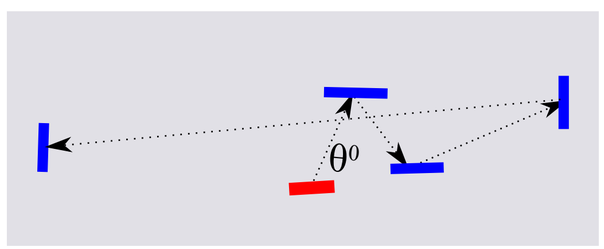
QR Code for Android (4.0+) App

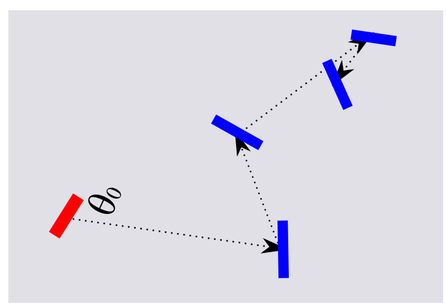
## What is a Path

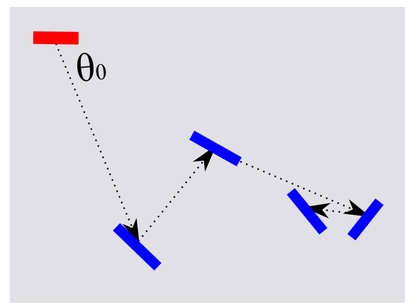



$cos(\theta_1) = (v_1 \cdot v_2)/(|v_1||v_2|)$

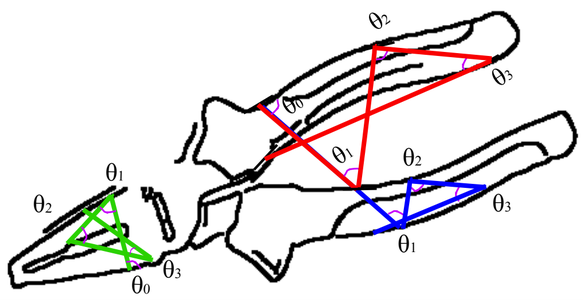


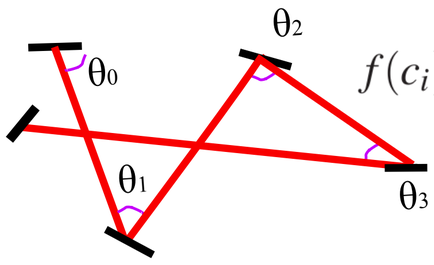




## Training



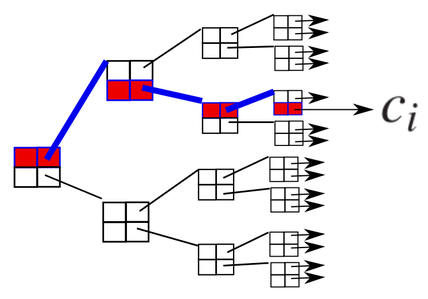




$$f(c_i) = (\phi_1, ..., \phi_{n-1}, \delta_1, ..., \delta_{n-2})$$

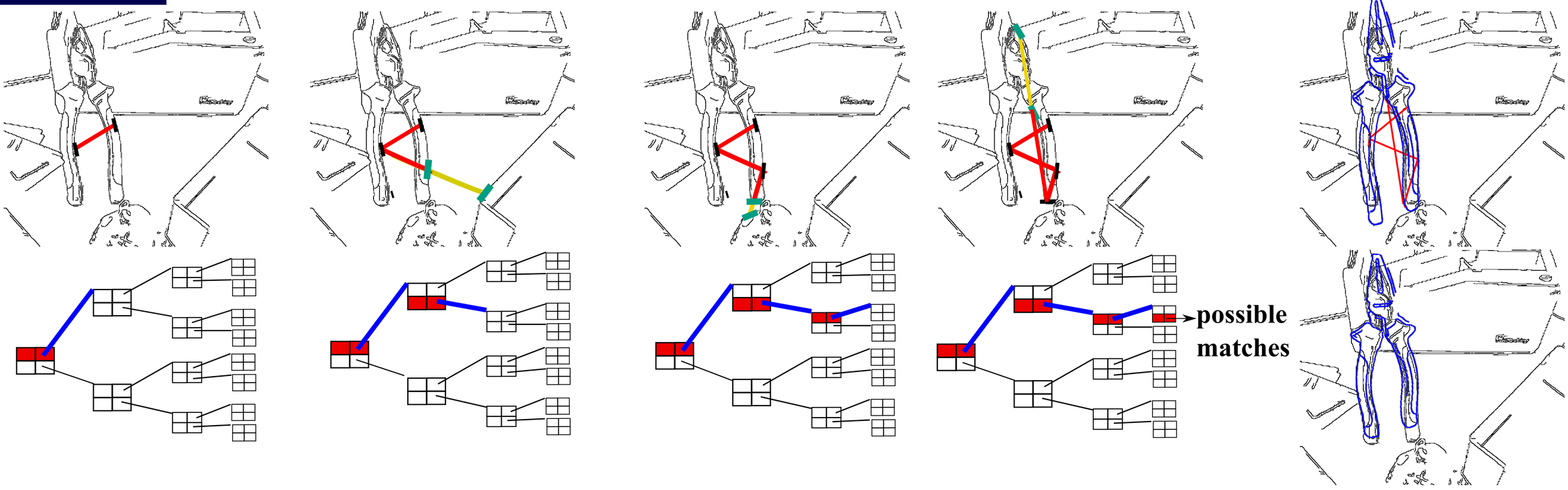
$$\phi_i = \widehat{e_i, e_{i+1}}$$

$$\delta_i = |v_{i+1}|/|v_i|$$

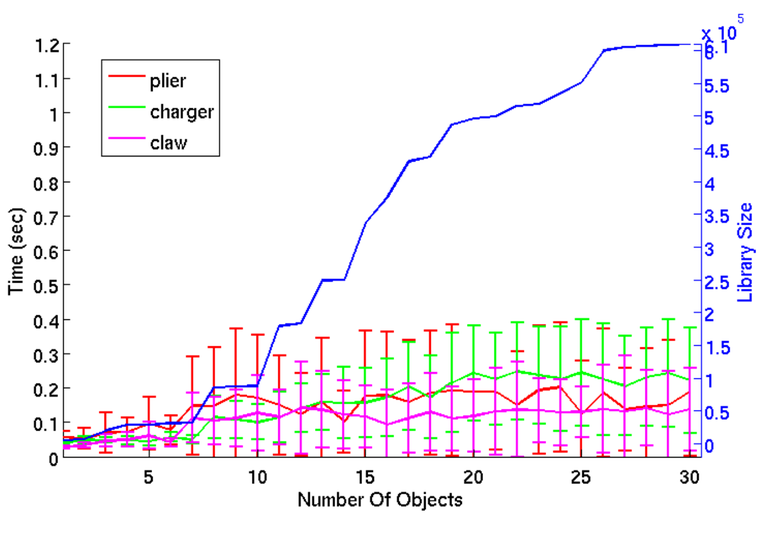
$\xrightarrow{f(c_i)}$

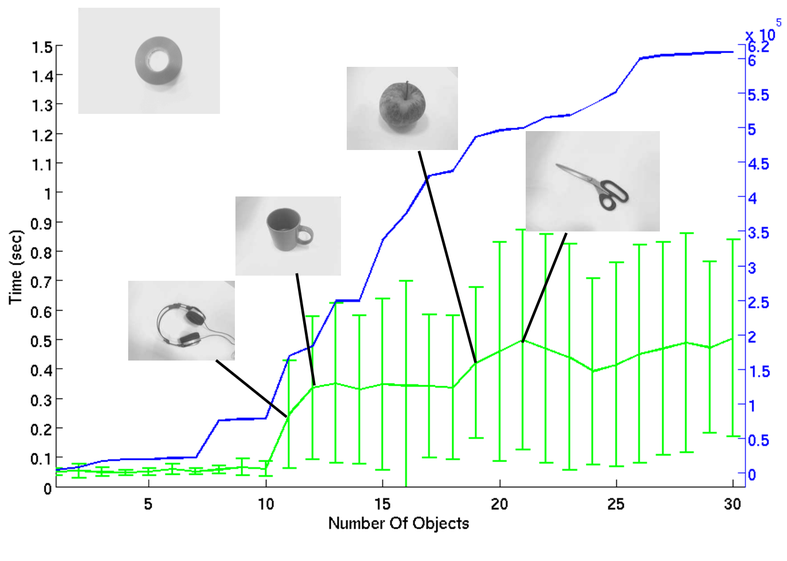


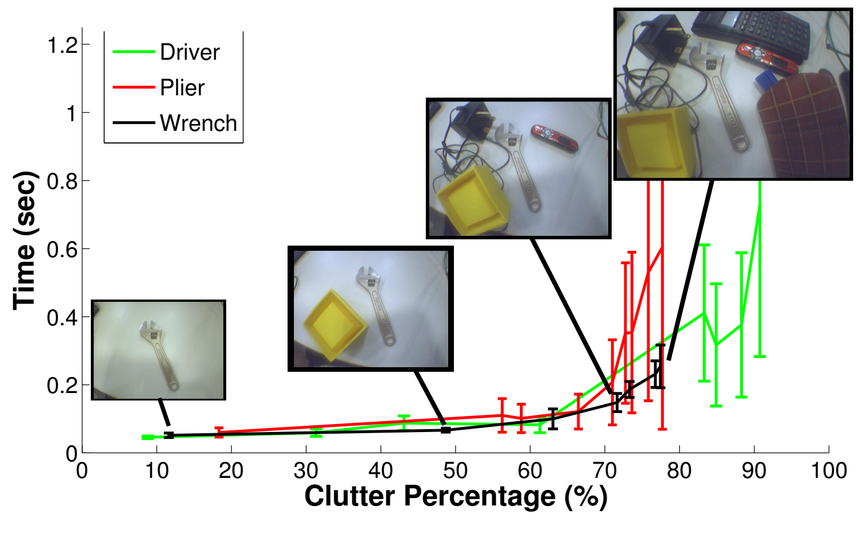

## Testing




## Results




## Reference

Damen, Dima and Bunnun, Pished and Calway, Andrew and Mayol-Cuevas, Walterio (2012). Real-time Learning and Detection of 3D Texture-less Objects: A Scalable Approach. British Machine Vision Conference (BMVC)