Five Shades of Grey for Fast and Reliable Camera Pose Estimation
Contents

• Roadmap
• Implementation details
• Obstacles & problems
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Roadmap

Week 1

A Request marker sample

B Edge(ys) Detection

Week 2

C RANSAC: Two directions

D Fit Calculated Grid

Week 3

E Marker Identification

Week 4

F Fix steps B to E

G Place Simple AR Object
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First Step: **Edgel detection**

1. Scanline

2. Sub-pixel suppression

3. Ransac

4. Fit line
Second Step: **Line grouping**

- Divide edgels into vertical and horizontal lines
- Homogeneous Coordinates
- Ransac Algorithm
Third Step: **Group clustering**

- One line per grid index
- Mean shift filtering
- Mapping from line to cluster
Fourth Step: **Grid fitting**

- Linear Regression of cluster lines
- Find grid equation: baseline + (k*i + q)*horizon
Fifth Step: **Marker identification**

- Estimate homography from grid corners
- Calculate shade differences & search decision tree
Sixth Step: **Grid augmentation**

- Position & rotation within marker obtained from decision tree
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Obstacles and Problems

- Image Pipeline: Sequential, suboptimal for Teamwork :-/
- Sparse implementation information in the paper
- LineGrouping: Unstable
- Grid fitting: Wrong understanding of the paper
- Linear algebra
- Homogeneous lines (+Singularities)
- Time