Overview

Per-pixel weight

Laplacian smoothness prior

Convexity prior

Solving for depth

Finite difference approximation of surface gradient

\[ w_{\text{smooth}} = 0.1 \]

Stack all per-pixel equations in large linear system

Least squares solution over all pixels:

Non-convex but alternating assignment/optimisation usually obtains global optimum

Decomposing polarimetric measurements to a polarisation image

One of the possible polarisation normals

 Experimental Results

Experimental Results

Summary

Positive:
- Monocular
- Passive
- Uncalibrated illumination (can be spherical harmonic)
- Can be made single shot
- Depth directly by solving large, sparse linear system

Assumption:
- Dielectric material (non-metallic)
- Orthographic projection
- Reflectance can be characterised as specular or diffuse dominant
- Known index of refraction (assumed = 1.5)
- Uniform albedo