Low Cost Artificial Targets For Terrestrial Laser Scanning

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Outline

• Introduction & Background
  • Existing terrestrial laser scanning targets
• Alternative Methodologies
  • Mean
  • Median
  • Least-squares geometric form fitting
• Quality Assessment
• Conclusion
Introduction & Background

• Artificial Targets
  ◦ Planar
  ◦ Spherical
  ◦ Cylindrical
  ◦ Pyramidal

• Natural Features
  ◦ Edges
  ◦ Planes


Introduction & Background

• Drawbacks:
  ◦ Expensive
  ◦ Not reusable
  ◦ Software dependent
  ◦ Fixed dimension
  ◦ Black box
Methodologies

• Mean of centroid
• Median of centroid
• Least-squares geometric form fitting
  ▫ Edge detection via interpolated intensity image
  ▫ Edge detection via raw point cloud

Experimentation

• Trimble GX
• 5m by 5m by 3m lab
• Observed 40 targets on 4 walls
Quality Assessment - Precision

Mean

Median

LSA - Interpolation

LSA - Raw

Quality Assessment - Accuracy

Mean

Median

LSA - Interpolation

LSA - Raw
Conclusion

• Least square geometric form fitting is superior
  ▫ Instrument/software independent
  ▫ Transparent
  ▫ Inexpensive
• Sub-millimetre precision and accuracy achievable with paper targets
• Edge detection method has negligible effect