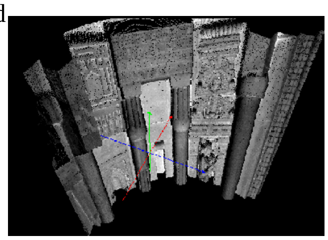
Range Sensing

Organizers & Chairs: Martial Hebert, Larry Matthies

Active and Passive Range Sensing for Robotics

Martial Hebert
Carnegie Mellon University

- Survey of current trends and results in the area of range sensing, including:
- Time of flight ranging
- Passive stereo
- Active triangulation

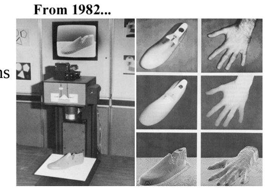


Beyond Range Sensing: XYZ-RGB Digitizing and Modeling

Marc Rioux
National Research Council Canada

- The 3D digitizing and modeling research activities at the NRC laboratories
- From B&W to Color (The use of multi-wavelengths laser sources for color digitizing in 3D)
- From 3D Data Points to Geometry (The use of modeling techniques to recover geometry from 3D data points)
- From Geometry to Reflectance Modeling (Color modeling using both the 3D data points and the registered color data)

From 1982...

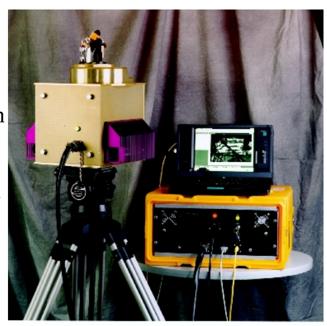


...to 1999

Imaging Laser Scanners for 3-D Modeling and Surveying Applications

D. Langer[1], M. Mettenleiter[2], F. Haertl[2] and C. Froehlich[2]
[1]Z+F USA, Inc. and [2]Z+F Wangen, Germany

- Introduction to Laser Radar Measurement System
- Profiling Laser Radar Deflection System
- Imaging Laser Radar Deflection System
- Application Results in Reverse Engineering and Inspection



Passive Night Vision Sensor Comparison for Unmanned Ground Vehicle Stereo Vision Navigation

Ken Owens and Larry Matthies
California Institute of Technology

Motion estimation from laser ranging for autonomous comet landing

Andrew E. Johnson and A. Miguel San Martin
California Institute of Technology

- To estimate spacecraft motion during comet landing using scanning laser rangefinder data.
- Terrain map generation followed by terrain map alignment using SSD and gradient descent.
- Two tests were conducted with data collected using a long range scanning LIDAR. These tests resulted in a 4.4 Hz frame rate and a motion accuracy of 0.5m over 70m of descent.
- Motion estimation for comet landing can be done quickly and accurately using a scanning laser rangefinder.