



Konica Minolta VIVID 9i

Computer Vision for Cultural Heritage 2007

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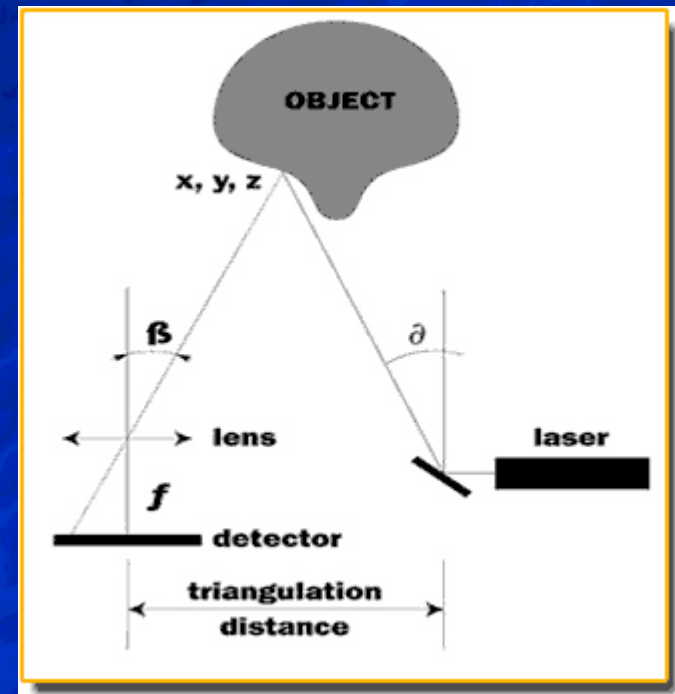
Our Motivation

- Design projects => to get a 3D model for planning
- Cultural heritage => scanning small objects for virtual museums and for research purposes
- 3D plotting for museums
- To understand the principle of triangulation scanners to build a scanner
- How to create good quality textures on 3D models
- How to work with 3D data
- To understand the pros and cons of the method



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- Triangulation Based Scanner
- Active Light System
- Laser Fringe
- 3 unknowns (XYZ)
- 3 equations
 - 2 from colinearity
 - 1 from laser plane (no redundancy)





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Turntable





Advantages of the 3D Scanner

- Non-contact - measuring without touching
- Portable - with only 11 kg easy to carry
- Accurate for 'medium sized' objects - with up to ± 0.010 mm accuracy
- Fast acquisition - with up to 3 seconds per scan
- Color-mapping - captures 3D shape and color with only one scan
- Easy to Use - operating is almost as easy as photographing with a digital camera



Disadvantages of the 3D Scanner

- Relatively expensive ~ 60.000€
- Edge Curl effect
- Material constraints (transparencies...)
- Capturing texture / image
 - Lighting conditions
- Fixed Baseline (shadow effect)
- Lack of universal standards



Our Examples





Pottery

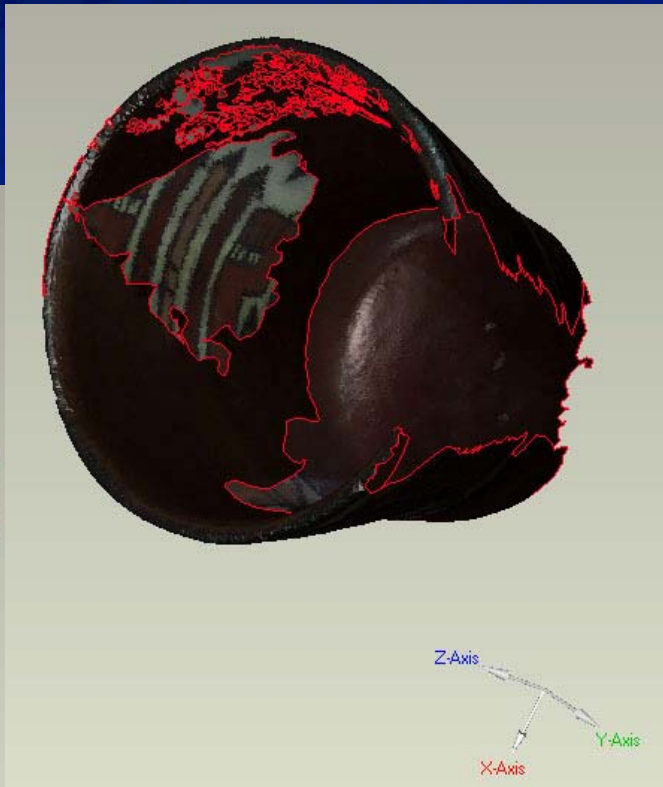




Pottery



Scan #1



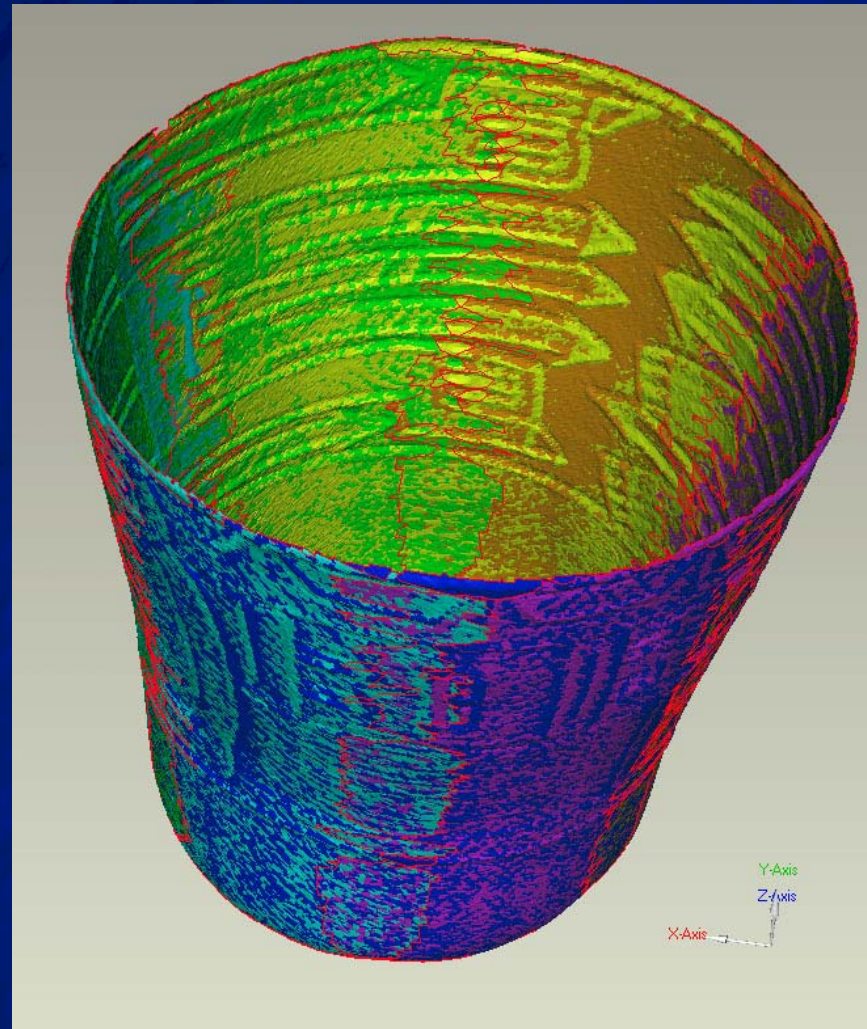
Scan #2



Scan #3

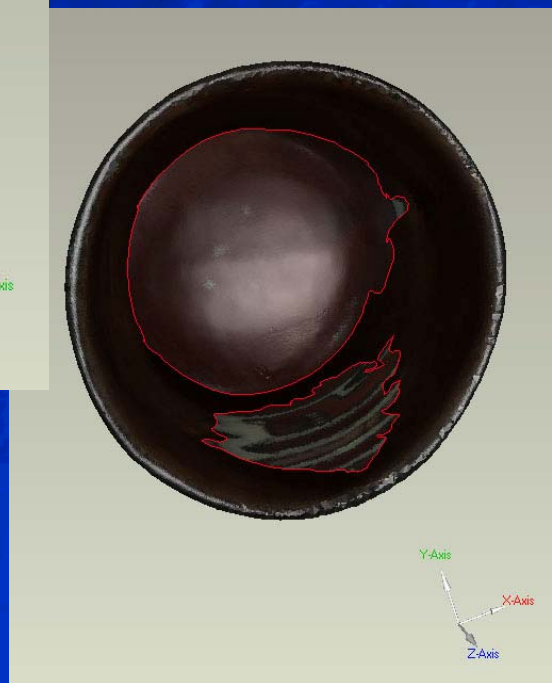


Pottery



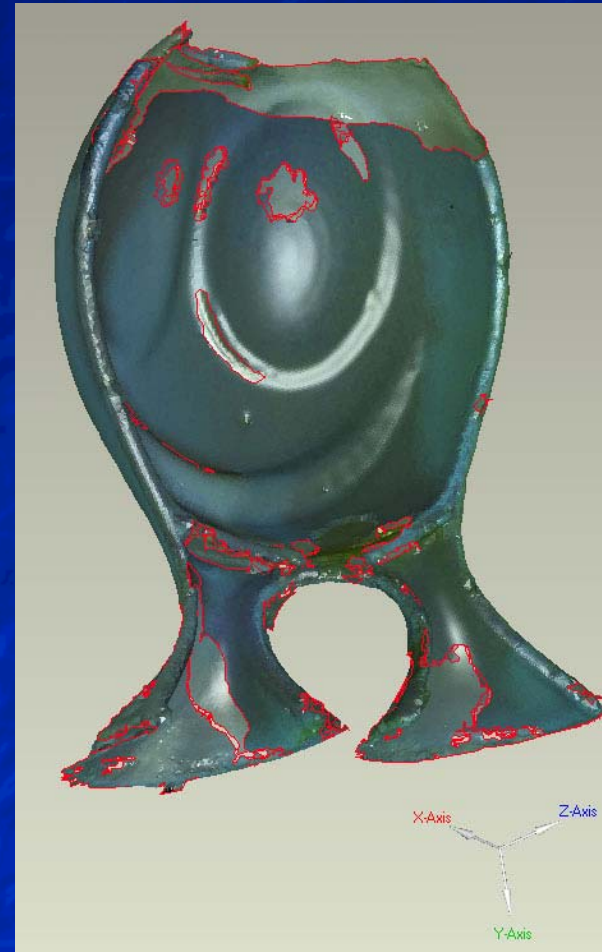


Pottery





Alien



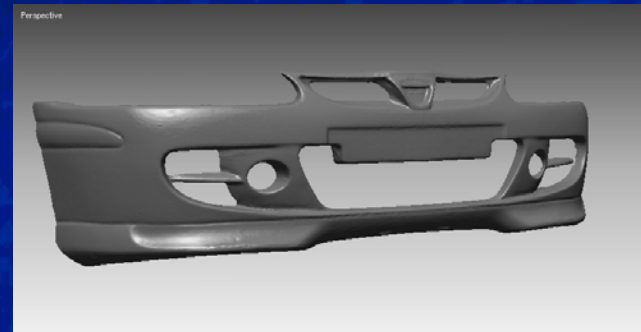


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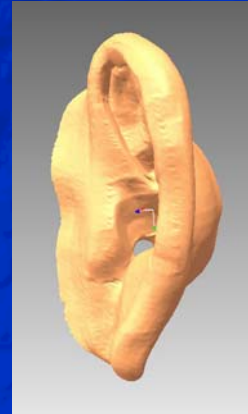
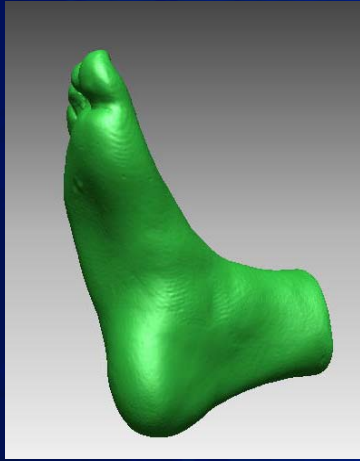
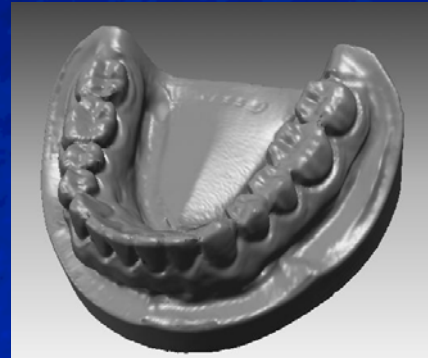
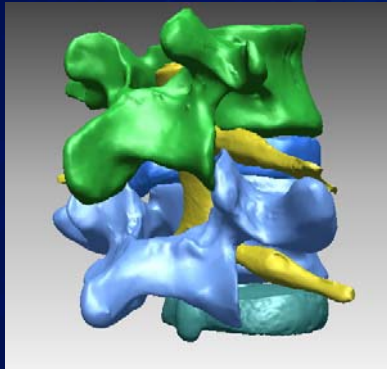


Engineering Examples





Medical examples





Conclusions

- Acquisition systematization
 - data system design
 - information design
- Working methodology
 - experienced personnel
 - positioning the object
 - manual processing of the acquired data
- It is not a Panacea.
- Hybrid approaches (photogrammetry, laser based systems)



Thank You For Your Attention

