

# Towards the “New” Digital Preservation: Review of 3D Scanning as a Key Technology

2022-06-10

Make today matter



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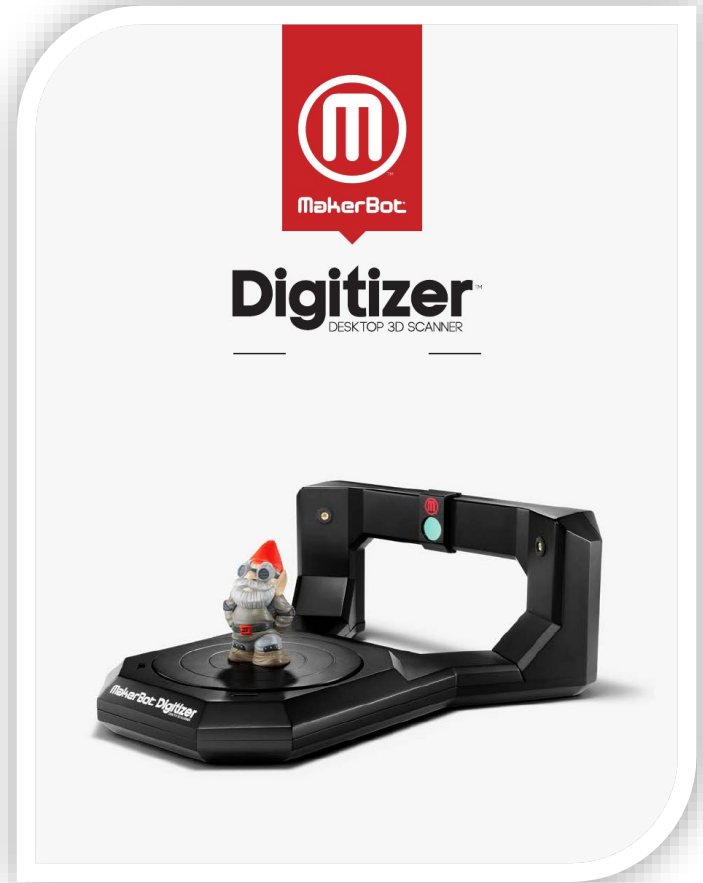
# Overview

- What are the various 3D scanners?
- Their benefits and limitations
- Project collaborations
- The preservation of 3D files
- Future considerations



# The Makerbot

MakerBot Digitizer runs on simple, software that creates clean, watertight 3D models so that you can turn physical objects into 3D design files.



# Einscan

EinScan 3D scanners use structured light technology which casts light patterns onto an object. The 3D scanner produces an accurate 360° digital representation of the physical object by fusing single dimension scans that are captured at different angles.



# Creality

Creality adopts intelligent large-scale alignment algorithm to ensure automatic matching without manual grid alignment, calibration, or the use of markers.



# CT scans

CT scan combines a series of X-ray images taken from different angles around your body and uses computer processing to create cross-sectional images (slices) of the bones, blood vessels and soft tissues inside your body. CT scan images provide more-detailed information than plain X-rays do.



# Laser scanning

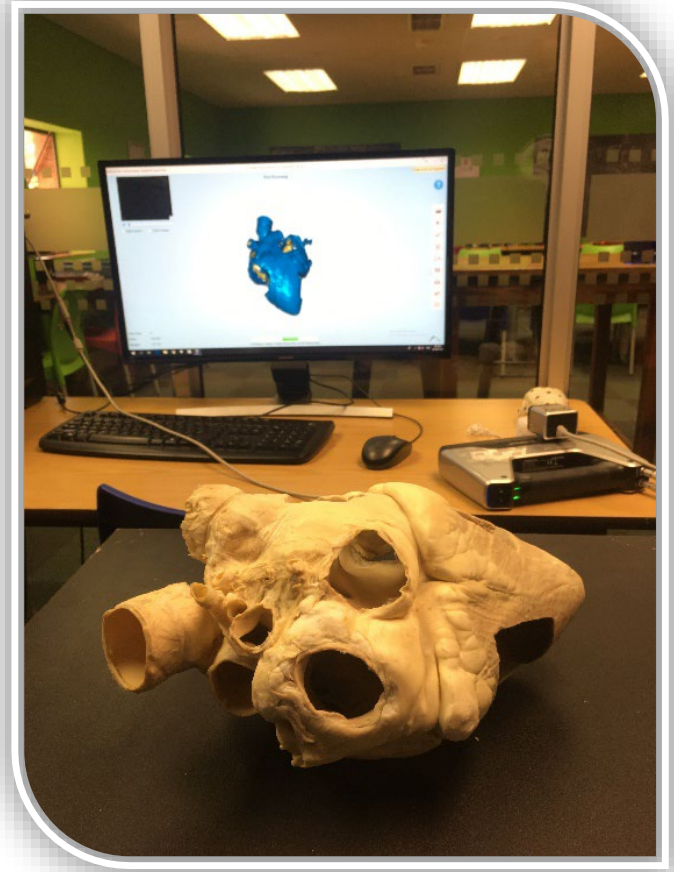
The Laser Scanner emits a beam of infrared laser light onto a rotating mirror that effectively paints the surrounding environment with light. The scanner head rotates, sweeping the laser across the object or area. It is a popular land survey method.





# Benefits

- Saves time in the design stage
- Streamlines the prototype process
- Fast and comprehensive quality control
- Ability to remanufacture parts without CAD
- Easy to compare designs to manufactured products



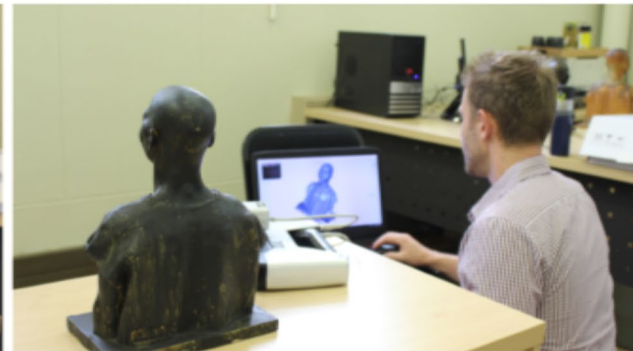
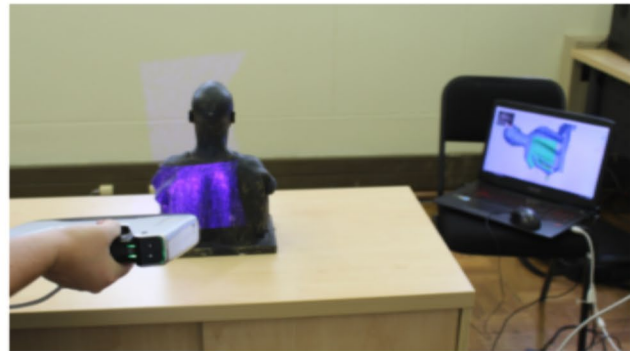


# Limitations

- Some scanners can't successfully scan transparent, very dark or reflective objects without the use of scanning spray
- Relatively high system requirements
- Relatively expensive
- Clarity depends on the kind of scanner
- Large space
- Scanner components require maintenance plans



# Project collaborations: Basotho Witness Bust



# Project collaborations: Albatros wing scan

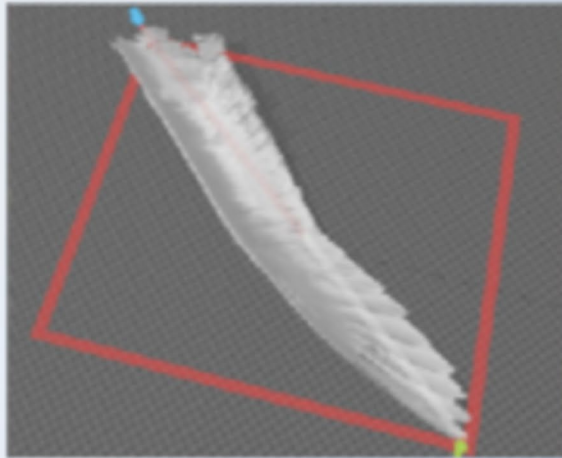
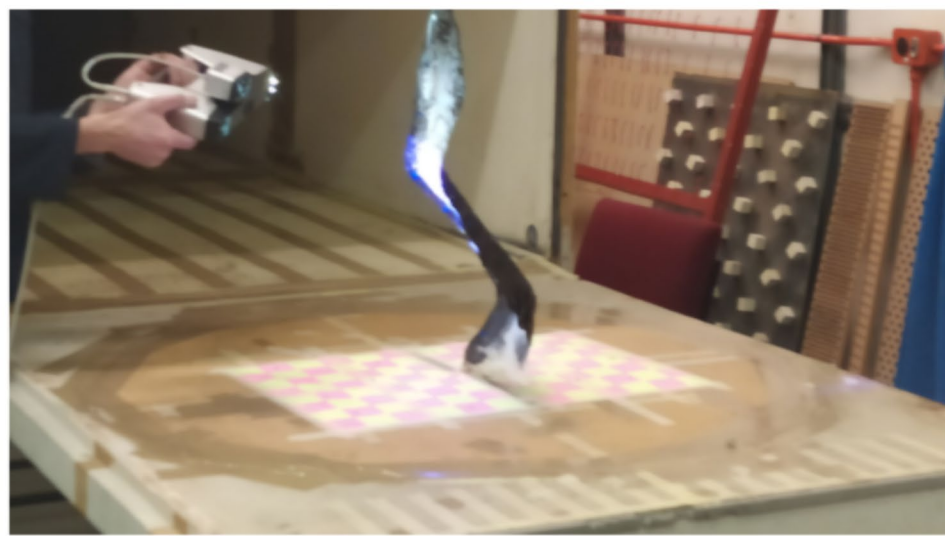
## AT MAKERSPACE

The albatross is one of the most energy-efficient travellers in the animal kingdom. With the knowledge of Mother Nature, technology and interdisciplinary collaboration, UP researchers are finding ways to make future air travel cheaper, cleaner or faster.

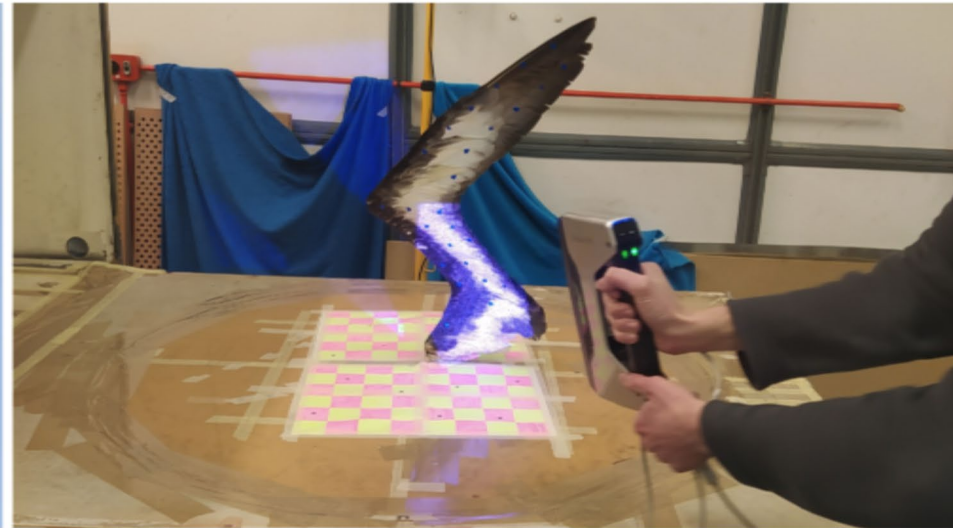
Researchers: Janine Schoombie, Dr Lelanie Smith and Professor Ken Craig,  
Department of Mechanical and Aeronautical Engineering  
Collaborator: Department of Library Services

Imagine an aircraft that  
automatically adjusts its flight

Creativity at work

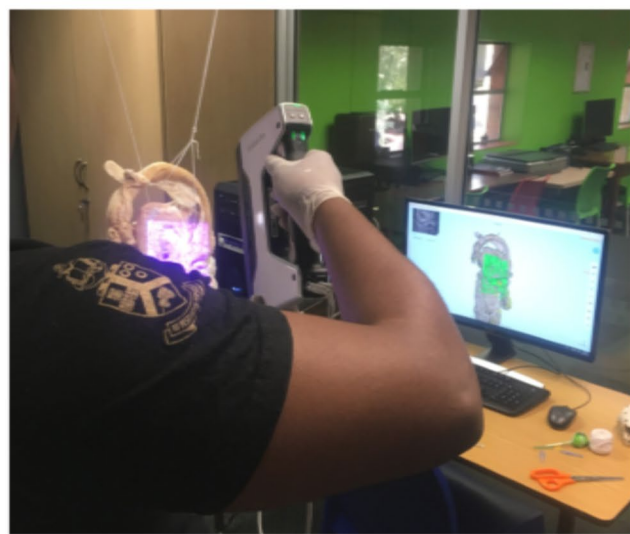


Underside of  
the 3D-scanned  
wing with  
measuring  
points





# Project collaborations: Veterinary Sciences



# The preservation of 3D files

## Digital Preservation Coalition Guide

- Preservation challenges: Complexity and lack of interoperability
- External dependencies such as unstable links
- Cultural/ownership issues – copyright
- File formats
- Metadata standards



# Future considerations

- Creators should work with records managers or archivists at an early stage in any activity that involves the creation of 3D files
- If working with external vendors, be careful to ensure that there are no copyright or other intellectual property issues that could constrain preservation of 3D objects.
- Best practices
- Record the process along the way

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# Thank You

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# Links and references

- **Makerbot Digitizer:**
  - Videos: <https://www.makerbot.com/stories/news/makerbot-digitizer-desktop-3d-scanner-order-today/>
  - Image: <https://shop15004.boreration.com/content?c=makerbot%20digitizer&id=9>
- **Einscan:**
  - Videos: <https://www.youtube.com/watch?v=g9vdAXy6Qq8>
  - Images: [shorturl.at/uHPU2](https://shorturl.at/uHPU2)
- **Creality:**
  - Videos: <https://www.youtube.com/watch?v=bPI6yrVw2As>
  - Image: [shorturl.at/jmoGS](https://shorturl.at/jmoGS)
- **CT scan:**
  - Videos: <https://www.youtube.com/watch?v=l9swbAtRRbg>
  - Image: [shorturl.at/jkJ02](https://shorturl.at/jkJ02)
- **Laser scanning:**
  - Videos: <https://www.youtube.com/watch?v=iHUJe2VfnMU>
  - Image: <https://blog.topodot.com/what-is-laser-scanning-and-how-can-it-be-used/>



# Links and references

- <https://blog.medit.com/solutionix/5-reasons-to-use-3d-scanning>
- <https://top3dshop.com/blog/shining-3d-einscan-se-3d-scanner-review>
- <http://prosancons.com/technology/pros-and-cons-of-3d-scanning/>
- <https://www.skmurphy.com/blog/2015/06/03/3d-scanners-current-limitations/#:~:text=Today%20there%20are%20three%20setbacks,scan%20transparent%20or%20reflective%20objects>.
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- [shorturl.at/brMN6](http://shorturl.at/brMN6)

