CT Scanner
CAF Central Analytical Facilities
STELLENBOSCH UNIVERSITY

CT News Issue 1

Jan/Feb 2013 Volume 1, Number 1

In This Issue

Recent interesting scans (clickable links)

Two bits of paper with a 20 micron coating layer
http://blogs.sun.ac.za/ctscanner/2013/01/09/paper-with-thin-coating/

An aluminium block with 3 laser weld seams
http://blogs.sun.ac.za/ctscanner/2012/12/07/laser-weld/

Test report of various components with cracks and defects

http://blogs.sun.ac.za/ctscanner/2013/01/28/example-ct-report-non-destructive-testing-of-various-components-for-cracks-porosity-and-inclusions/

Crack and defect detection in archery equipment
http://blogs.sun.ac.za/ctscanner/2013/01/28/technology-for-sport-demonstration-of-ct-scans-for-crack-detection-in-arrow-and-bow-for-archery/

Composite material wind turbine blade from Sweden
http://blogs.sun.ac.za/ctscanner/2013/01/28/composite-wind-turbine-blade/

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Welcome

Welcome to the first of the Stellenbosch CT scanner email newsletters! The aim of this newsletter is to keep in touch with our clients, and we hope you find this news interesting and exciting - so much so that you even send it on to your colleagues. In this way this powerful technology can be made available to more people and applied to even more interesting applications. Your support is much appreciated!

People

Our latest addition to the team has been Sarah Knuth, who is doing an internship at the CT scanner. Sarah's project involves studies of spiral grain in Eucalyptus trees. We regularly take interns and in-service trainees are welcome.

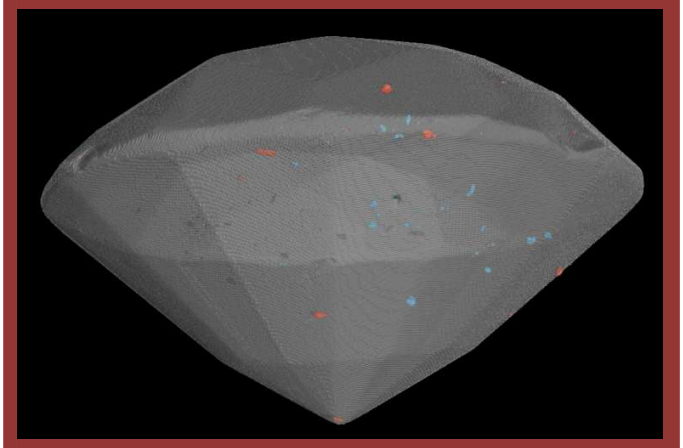
Achievements

Our **financial target for 2012** was reached successfully – a great thank you goes to all loyal supporters and also new clients of the facility!

Our **first international project** was completed successfully in November. Our low rates coupled to the fast turnaround times and high quality we strive for, make it worthwhile for international clients to send their samples to our facility for scanning.

A **first publication** describing CT scans of ancient Egyptian mummified animals was accepted for publication in January 2013.

Another **conference paper** is still in the publication process, from the RAPDASA conference in November 2012.



CT Scan of an aquamarine gemstone, showing more dense inclusions in red and less dense defects/voids in blue in full 3D.

For a rotation animation of this image, click here:

http://blogs.sun.ac.za/ctscanner/files/2013/01/gemstone-rotate-new.avi

Application of the month: *3D Fingerprinting of gemstones*

One very interesting project involves the 3D blueprinting or "fingerprinting" of precious stones. The figure on the left shows a 3D view of an aquamarine stone from the University's Gemmology Department, made semi-transparent and showing the inclusions and defects identified and mapped in 3D in red and blue. This accurate mapping allows perfect, unique identification of stones based on the location of these defects, which would make it possible to 100% accurately identify a recovered stone after a robbery. This unique service offering is available for insurance purposes for precious stones, the only limitation is that the stone must be removed from any setting before scanning (which must be done by a jeweller). The service includes a high-resolution scan, full resulting volume data (approx. 20Gb) in two formats for easy future use, with a short report on the settings and details of the scan. The cost is R3000 and a recovered stone scan with comparison between new and old data will also cost R3000.

In a first of its kind worldwide, a project is planned in which a large special University collection of gemstones will be scanned. Watch this space for more info soon!

Collaboration project: *Ancient animal mummies*

This ongoing collaboration project involves the scans and analysis of some very unique artefacts, originally from ancient Egypt, currently housed in Museums across South Africa. A blog website has been set up to keep track of developments and we will regularly update on the progress in this newsletter.

http://blogs.sun.ac.za/as

The power of CT technology is shown in the images to the left, where the presence of a full hawk is confirmed and further information can be extracted due to the high resolution of the scans.

The latest news update is that a specimen from the Pretoria branch of Iziko Museums will be scanned on 7 February. Watch this space!

Special offers

Commercial applications special: Pay only academic rates for the first scan, no charge if not satisfied with results!

2013 Service Contract: Pre-book and pay more than 50hrs of work for the year, and get 10% additional services. Faster turnaround times are ensured for service contract clients.

Events

The first national CT conference in South Africa is planned for September this year – this is a great opportunity to share experiences, see

http://blogs.sun.ac.za/ctscanner/2013/01/31/ct-conference-imaging-with-radiation/

Ask 2 scientists - service

The new "ask 2 scientists" service takes the form of a blogsite, where users can pose any technical and scientific questions to 2 scientists (hence the name). We try to help by using our scientific training and our focus is on fast response and making full use of our networks of scientific experts. See http://blogs.sun.ac.za/cafprojects

We also offer our services for physical consultations and advice. We can offer lab and scientific management consultations.

Acknowledgements

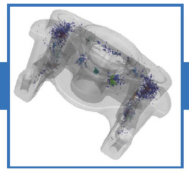
The CT scanner equipment acquisition was made possible with grants from the National Research Foundation and Stellenbosch University.

GE
Measurement & Control

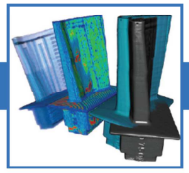
Stellenbosch University provides CT application services with GE technology

phoenix v|tome|x m

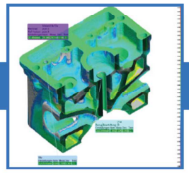
Versatile X-ray Computed Tomography system for non-destructive testing and 3D metrology



Automatic NDT pore volume analysis in an aluminum casting.



3D analyses of a scanned turbine blade.



3D measurements and nominal-actual CAD comparison on an aluminium cylinder head.

Improving product quality and reliability with CT

- High accuracy 3D metrology and non destructive inspection tasks performed with minimal operator training
- By contrast to conventional CMM systems, a CT scan captures even all hidden features for 3D measurements, part-to-CAD comparison or reverse engineering
- Virtual defect analysis e.g. by 3D volume evaluation or virtual multi-positional 2D cross sectioning
- Increased 3D inspection throughput due to high power X-ray tube, efficient, fast detector technology, accelerated velo|CT reconstruction and click & measure|CT functionality

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