Z Corporation ZPrinter® 650 stimulates inter-departmental collaboration at Durham University

Durham University Department of Computer Science

- England's only Centre for Excellence in Teaching and Learning in Computer Science

Challenge

- Fostering project collaboration across academic disciplines

Strategy

- Using the ZPrinter 650 multi-colour 3D printer for a variety of applications

Results

- Transformed inter-departmental collaboration
- Enhanced research and learning process
- 3D models printed quickly, easily and affordably

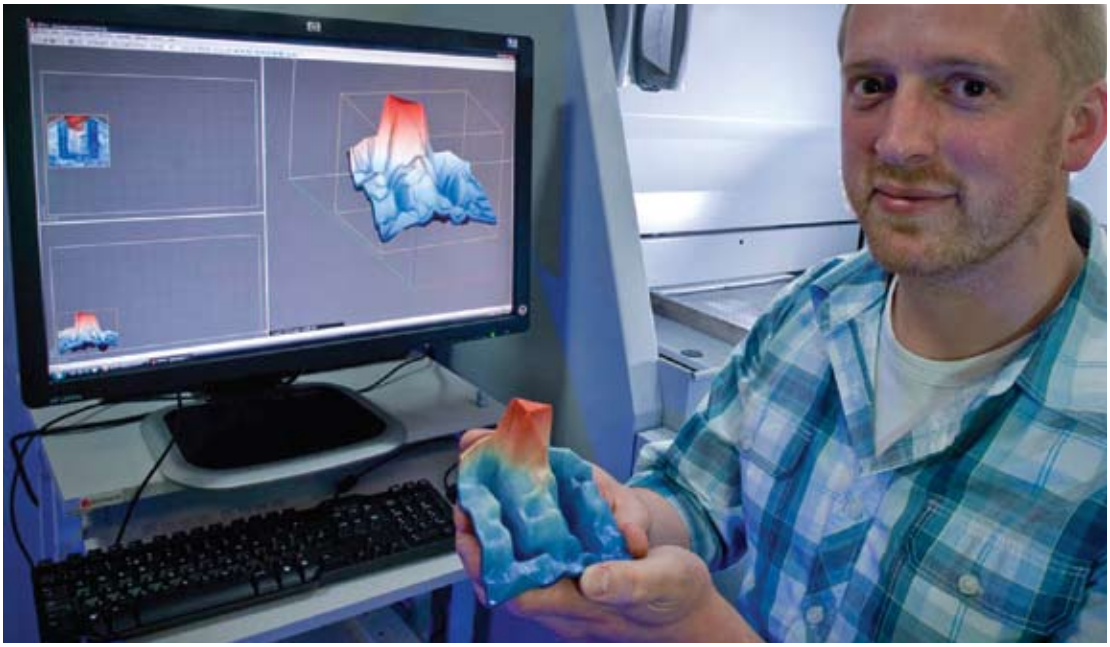
"I can see a day when perhaps every department at Durham will have a 3D printer."

– Dr. Liz Burd, Senior Lecturer in the Department of Computer Science and Deputy Head in the University's Faculty of Science

A ZPrinter® 650 3D printer supplied by Z Corporation's London-based reseller, ThingLab (an Inition Ltd company), is transforming inter-departmental collaboration at Durham University and is helping the university's earth scientists to understand the geology and conditions that cause earthquakes in Italy.

The Department of Computer Science at Durham University — England's only Centre for Excellence in Teaching and Learning in Computer Science — has recently installed a Z Corporation ZPrinter 650 3D printer.

The ZPrinter 650 is engineered to satisfy the most demanding requirements in engineering, education, AEC, GIS and entertainment. With the largest build volume of any 3D printer, it enables users to print very large, high-resolution, multicolour models in a few hours or to make many, smaller models at once.



Dr. Andrew Hatch holds a 3D model of a geological feature created for Durham University's Earth Sciences Department.

CHALLENGE

Fostering inter-departmental collaboration

On the advice and recommendations of her departmental colleagues, Dr. Liz Burd, senior lecturer in the Department of Computer Science and deputy head in the university's Faculty of Science, purchased the ZPrinter 650 as a tool that could help facilitate and encourage inter-disciplinary research across many different academic disciplines.

"Part of our research group's remit is to use the latest computer science and technology to help other departments," she says, "which is the main reason why we purchased the ZPrinter 650. However, when we first installed the machine we struggled to attract the interest of other faculties. People just didn't seem to understand what we could do for them. Now that we've had the opportunity to introduce them to the technology and how a 3D model can help them solve their problems, we've had many requests for our services."

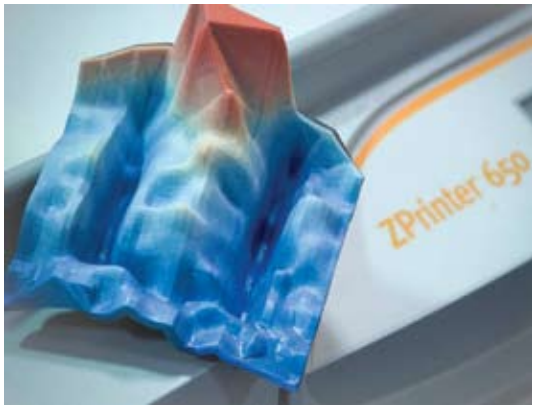
SOLUTION

ZPrinting across multiple departments and applications

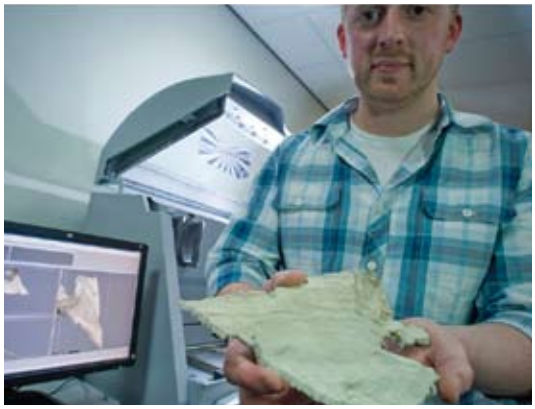
One particular, high-profile project currently being undertaken is with the Earth Sciences department. Dr. Ken McCaffrey, reader in Earth Sciences at the university, has created an extraordinary and detailed 3D map of the surface ruptures related to the cataclysmic earthquake that devastated the Italian Apennine region of Abruzzo. The mapping project, part of the wider relief-effort reported in the UK national and the international media, is using the ZPrinter 650 to create colour, 3D representations of the regional geology. The results of Dr. McCaffrey's project will, it's hoped, help to improve the understanding of "quakes, their timing and likely magnitude."

Z CORPORATION®

Case Study: Durham University



A close-up of the colour 3D model of a geological feature. The colours are mapped to model height — the data comes from electrical earth resistance, and shows regions of low to high resistance.



Dr. Andrew Hatch with a 3D model of a cliff face. The real cliff face is in Southern California. Scientists scanned the cliff face and created the model to facilitate the study of erosion and geological faults.

Dr. Burd claims that the new ZPrinter 650 is also helping researchers at the university to deal with complexity in a wide variety of other subject areas. By modelling mathematical or physical problems in 3D, she claims, researchers are often better able to understand the nature of a problem.

"Computer technologies introduced scientists, researchers and engineers to 2D programmes. Then, after a while we were able to take models one-step further and use computers to create 3D renderings. Being able to quickly, easily and cheaply turn those 3D renderings into physical models using our ZPrinter 650 is fantastic and greatly enhances the research and learning process, whatever the nature of the application. Since our work with Earth Sciences, and their very public involvement with the Italian earthquake, people in the university are now much more aware of what we have and what we can do to help them with their specific problems."

The ZPrinter 650 has also been key in the development of a project in collaboration with the RNIB (Royal National Institute for Blind People), creating 3D mapping of objects to support partially sighted people. Another project is using data collected from an area of coastal cliffs in Southern California. The ZPrinter 650 is being used to create a model of the cliff face, enabling scientists to study fault lines and erosion.

Whatever the project, Dr. Burd describes 3D printing as a "marvel" that people don't quite believe until they use the technology for themselves. "The Z Corporation machine is so straight-forward to use," she says. "You plug it into the office main power supply, download a 3D model from your CAD system and a few minutes later you can have the model in your hand. It's clean, quiet and it is such a quick and intuitive process that we printed models on the very first day we had the machine."

Dr. Andrew Hatch is a research associate and a member of the Technology Enhanced Learning Research Group at the university's Department of Computer Science, working alongside Dr. Burd. It was Dr. Hatch and his departmental colleagues who were charged with researching 3D printing, before recommending what machine would be suitable for the university's wide variety of possible applications. He began his investigations by researching information through reseller websites.

"We knew about ThingLab's website (www.thinglab.co.uk) from previous 3D scanning projects," he says. "The site's an excellent resource and its product descriptions and online videos helped us to identify what we needed and ultimately, to choose the ZPrinter 650 as the machine most suited to our needs. The sales and support people at the company have also been excellent. Once we'd decided to buy the machine, the installation and training was well-delivered and very professional."

RESULTS

ZPrinting has enhanced the research and learning process and transformed project collaboration among departments

Durham's ZPrinter 650 has also been introduced and demonstrated to students during university open days and will soon be offered as an integral part of student support. Both Dr. Burd and Dr. Hatch believe that the application of 3D printing will continue to expand across departments and other colleges and universities around the country.

"I can see a day when perhaps every department at Durham will have a 3D printer," says Dr. Burd.

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Durham University

Durham University
University Boulevard
Thornaby
Stockton-on-Tees
TS17 6BH
United Kingdom
www.dur.ac.uk

Z CORPORATION®

WORLDWIDE HEADQUARTERS
Z Corporation
32 Second Avenue
Burlington, MA 01803 USA
+1 781 852 5005

www.zcorp.com