



SPEE3D & Charles Darwin University Case Study

A world-first 3D printer that creates metal parts very quickly and cheaply is providing a new direction and potential new markets for the technology. Northern Territory (NT) innovators SPEE3D are now working with Charles Darwin University (CDU), which purchased one of the LightSPEE3D printers to identify opportunities to commercialise the device. NERA spoke to SPEE3D Founder and Chief Technical Officer, Steven Camilleri, and CDU Biomedical Engineer, Dr Rebecca Murray, about their collaboration and new technology in remote locations.

Steven, what's so innovative about the LightSPEE3D printer?

Basically, our technology prints metal parts very cheaply and very quickly. We are currently printing in aluminium and copper and moving into steel, which is a cheap material to use when you want reasonable strength but don't want to spend too much money. That's why we build cars and trains and buildings out of steel – because it's one of the cheapest ways to hold things up. Generally, there isn't much interest in 3D printing steel because it is costly and the part printed doesn't have a lot of value.

We are looking at providing urgently needed steel parts or equipment with our technology, in areas such as marine, rail, military, mining and oil and gas. These markets typically have operations located outside the usual industrial base, require sophisticated, high-performing parts, and often need them urgently.

How are you commercialising this product?

Australia is an interesting place to be commercialising, and this is my second time working with an innovative product. Australia has a lot of advantages, and some disadvantages. We have access to good people, we are very innovative as a culture, we like solving problems, and generally we are a bit irreverent – we don't mind thinking that we're doing something a little better than what's out there. But we are very remote, it's difficult to get access to customers here, it's difficult to get access to finance, and if you need highly specialised skills it can be a challenge. It's a bit of a trade-off so we have to use the system to our best advantage.

Our universities are very high quality, and we have access to very good people. The government innovation grant system suits companies working with the universities very well, and there's motivation on both sides for collaboration. We've had a lot of success with collaborating, both with this technology and with the last product we developed.

Why did you seek to collaborate with CDU?

We are bringing our very first 3D printer into CDU, and that will allow us to start looking at real world applications for the technology. We know the printer works, we have a good idea about cost and performance, but like any new technology, there's a lot of work proving application suitability. The university has a role in working out where a new technology might apply, publishing the results and letting people know it is available and will solve a particular problem.

Working with universities is natural for us. It gives us an expansion of scope that lets us get into applications quicker. The 3D printing technology we've developed can bring industrial scale manufacturing in a small, portable device, so we can start to solve big industrial problems in remote areas. CDU has expertise working in remote areas, across agriculture, mining, oil and gas, so it seemed like a natural fit that they look at opportunities for getting this new technology into remote area industrial-type applications.

We've formalised an Advanced Manufacturers Alliance (AMA) which is a co-operative group that allows us to do our research and development and all the things that CDU does well.

The AMA allows us to collaborate on projects, bring in grants and work on developing applications for technology, as well as qualification of the materials, working with standards bodies – the things that suit a university with research labs and research staff that can carry out long bodies of research work better than an industrial company.

We've brought in Dr Rebecca Murray to run the AMA at CDU. She has a background working with materials engineering and 3D printing so she seemed like a logical choice to get involved and we're very lucky to have her in Darwin.

Rebecca, what is your role in the AMA?

As part of my role at the AMA I've been working with CDU and SPEE3D to apply for grants, including one from the NT Government to acquire the very first LightSPEE3D printer at the university. We are looking at places like global innovation linkages, industry growth centres – different types of organisations to reach into different industries and attract money to perform the research and test the capabilities of this new technology.

I have worked in collaborative relationships like this previously. My experience prior to this was in Germany where I did a PhD in biomedical engineering. I also worked on a European Union project with eight entities in a cross-cultural collaboration between industries and academia, and we helped to develop products, including a spinal implant.

CDU is quite a new environment, so you're given a lot of opportunity to try and find solutions to challenges. Everyone has a problem-solving attitude, whereas in some other environments I've worked in it was more careful and process-driven, hierarchical.

How will you measure the success of the collaboration?

Some success will come from the applications we might find, new collaborations we might form, and the advancements we can do with the materials research so we can perhaps broaden the scope of what the machine can do. Those would probably be the main success stories around first-time research, which helps the university because it brings attention to CDU. The more funding we can attract, the more application research we can do, and getting commercialised applications is one of the things we want to help foster.

We are very excited about this technology and to have it as a world first here in Darwin is a unique opportunity that I feel the university and SPEE3D are really trying to capitalise on.