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Education-in-Practice article

The Hybrid Theatre: An interview with Professor Paul Bannon

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Abstract

The Hybrid Theatre at Sydney Imaging, the University of Sydney, is a state-of-the-art imaging facility that is the first of its kind to be dedicated solely to research and training. Professor Bannon, Deputy Director of the Hybrid Theatre, described this new facility. He emphasised the collaborative potential of the space for innovation in research and training to prepare the health workforce for both current and emerging technologies. The theatre uses the latest Siemens technology.

Keywords: future technologies, workforce education, interdisciplinary research, collaboration

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Sydney Imaging's flagship Hybrid Theatre at the University of Sydney has some of the most advanced imaging systems currently available, such as the Siemens ARTIS pheno system. I spoke to Professor Paul Bannon about his role in the theatre and the opportunities it affords for innovation in research and training. By combining the latest technologies with a mindset that prioritises research, the theatre has drawn collaboration from people in robotics to health. The theatre stands apart due to its potential to create developments in the future that we cannot yet envisage. The space also provides the opportunity for the health workforce to become familiar with the latest technologies, ensuring a full education in the capabilities of current and emerging technologies.

ET: What is your role in the theatre?

PB: I am Academic Director for the Hybrid Theatre, one of the three major components of Sydney Imaging at the University of Sydney. Sydney Imaging comes under the bigger structure of Core Research facilities.

ET: What is a hybrid theatre?

PB: The hybrid theatre that we have at Sydney is the theatre of the future, although that's not to say that we will all be doing everything in a hybrid theatre of this level. In this setting, we're able to train people not only in what they need to know now, but in what they will need to know in the future – and that's for surgery or any other interventional work.

In terms of the research aspects, it opens up an enormous field of being able to do things. The research aspect of the theatre is really wiping the slate clean and working out what's possible. I think that's the most exciting part, because it allows us to develop techniques to do things that have either never been done before, or to do things in different ways.

To give you an example of that, a really clear one, the imaging system integrates directly with the robotics. So we can go from an image taken, or a scan taken, on the table which can then inform the robotics system intuitively to take and perform a procedure you've directed it to do. You can then go further and start developing a robotics system to make its own decisions. Industrial robotics systems, or artificial intelligence systems, are not really making their own decisions, they're making decisions according to algorithms that we have created for them. Turning industrial robotics into medical robotics is very exciting and is only possible in a place like the Hybrid Theatre. To summarise, it allows us to advance what we do now and it allows us to find out what we can do better in different ways.

ET: What does a day at the theatre encompass?

PB: A day in the life of the Hybrid Theatre is broken up into two main areas of research and training. And they will be the two great uses for it. We are supporting internal researchers and external researchers, as well as industry, to use the technologies available and to develop training programs. If you are going to train people in what we're doing in hybrid situations now, you need a hybrid theatre to train in. And we are very keen to train people in the next generation of technologies. The surgeons and interventional physicians of the future need somewhere to train, not only in the current technology, but also in the newer technology – and that's what the facility provides. It can develop newer techniques that we're not doing currently.

Figure 1. Operating the ARTIS pheno C-Arm in Sydney Imaging's Hybrid Theatre

ET: You mentioned training programs earlier, could you elaborate on that?

PB: We're developing programs, starting with training people on the very basics of orientation around a high-end hybrid theatre. We're beginning to run courses on orienting people within the hybrid theatre of the future – training them on the use, the safety issues, on what the capacity of the system will be for research. Think about the medical students – they are coming down to the theatre to see what they will actually have to understand as the next generation of doctors. Our facility is very open to discussing tours, but also to organising instructional courses. We're just going through the process of putting those together as soon as possible.

We're very interested in the next stage in doing imaging of people where we can look at neuronal connectivity and how we learn. We're

looking at functional MRI (Magnetic Resonance Imaging) scans as well as the underlying defect or abnormalities with mental health studies such as depression, as well as what you expect us to look at after surgery and strokes, and how we can help to treat people. But we are very interested in all applications – it doesn't have to be medical.

As a teacher or a trainer, I've been heavily involved in the Royal Australasian College of Surgeons, as well as the Australian & New Zealand Society of Cardiac & Thoracic Surgeons. The training array for surgeons at the moment depends on what is done now, it has no capacity, really, to teach people what we expect to do in the next five or ten years. Or even to teach what they will be expected to do as young surgeons. If you have a site where you can introduce them to those concepts and techniques, and develop techniques in conjunction with the current training paradigm, then you'll have young surgeons who are better prepared for the job.

ET: Where do you see the theatre going in the future? What next?

PB: I was asked recently what I think this theatre can do, and the true answer is that nobody knows exactly. When we purchased this, Siemens recognised what we were doing, so they gave us high-end technology instead of the current technology. This was only the fourth system in the world. It's the only one solely for research and training. So we don't actually know what we can do. We do have the addition of a robotics system and the potential for getting those two to work together.

I've already been approached by nanoscience to look at nanorobotics systems. We're already talking about what we're developing and looking at scaling it down into another paradigm, if you like. Into developing things we can't even possibly imagine right now.

For more information about The Hybrid Theatre at The University of Sydney, visit their website,

https://sydney.edu.au/research/facilities/sydney-imaging/the-hybrid-theatre.html

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Conflict of interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article

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