

# Smart lighting within reach

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It's not often that an engineer finds inspiration for their research at the ballet. But for University of Queensland graduate Aaron Tan, the theatre was the perfect place to start his search for smarter lighting design.

Working with Dr Ralf Muhlberger from UQ's School of Information Technology and Electrical Engineering (ITEE), Mr Tan hopes to create the world's first interactive or affective lighting system, which can respond intuitively to the mood of audience members and performers.

At present, lighting design is both time and labour intensive, requiring each effect to be plotted manually during rehearsals and then followed on cue during each performance.

Mr Tan said two of his primary goals were to digitise the process – making it faster and more efficient – and to produce lighting effects that better reflected the emotions of those both on and off the stage.

“There's really no intelligence behind current mood lighting,” he said.

“The technology in question enables more control and accuracy in classifying emotion, providing a more robust and efficient approach to visual storytelling.

“This will also reduce the mental workload of the operator and lighting designer.”

Central to the project is the development of “emotional impact sliders”,

which would allow designers to portray stock sensations (happiness, sadness, anger, shock, fear and disgust) more easily and effectively.

Mr Tan's undertaking is part of ITEE's broader research program into how emotions are expressed and affected through technologies such as video conferencing, computer games and email.

“A lot of what we currently know about emotions is conjecture, and wishful thinking just isn't science,” he said.

“The measure of emotion is elusive in nature and I'm trying to improve that process.”

As part of his research, Mr Tan attended technical rehearsals for a recent Queensland Ballet production, and consulted industry experts including Steven Newman, director of photography on the blockbuster film *Superman Returns*.

He said a possible experiment involved placing sensors on a person's skin to measure their emotional reaction to different lighting effects.

Once these values were quantified, Mr Tan said lighting design could become a “smart” technology, which could sense the mood of users and adjust in real time.

“The research has proved that intelligent lighting is possible today with emerging technologies,” he said.

“As current user interfaces are inadequate for the needs of emotion-based lighting, the research is also focused on new design interfaces to define and represent emotions.

“With more research, the mental control of lighting systems will be a

reality in the near future.”

Source: University of Queensland

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