Innovators
Technology gets a guernsey

Sports uniforms can now do so much more than show what team you play for, **Nick Miller** reports.

ATHLETES often wear their hearts on their sleeves, but new sports jerseys developed at the University of Sydney will also show their foul count.

Honours student Mitchell Page has used cutting-edge wearable technology to make basketball uniforms a mine of information — updating and displaying in real-time a player's fouls, score, and even the amount of time left in a game.

"Team sports clothing already acts as a form of communication, about identity and position and team and sponsors," Mr Page says. "Maybe it can also carry statistics and information about the game itself."

He has built four prototype jerseys that he says helped players keep track of games and perform better, and increased spectators' enjoyment and engagement.

He predicts that such technology could transform the way sports are played on the field, and even use the players as billboards for video advertising at half-time.

Mr Page, a bachelor of design computing undergraduate, came up with the idea while playing computer sports games, which use graphics and icons to tie statistics to the virtual players and track their performance. He wondered how such on-screen graphics in sports telecasts could be made available to players and spectators at the ground.

Together with his supervisor, Dr Andrew Vande Moere, he came up with the TeamAwear system. They chose to try the concept on basketball because of its amount of fast-changing data such as points, fouls, statistics and time limits.

At first, he says, he considered a text-based display. "Players said they didn't want text or complex images," he says. "During the game their cognitive load is already so high, they want something simple and subtle where they can straight-away tell something has happened."

Players strap on a small computer the size of two decks of cards, which wirelessly connects to a courtside computer that updates the game statistics in real time. Electricity-carrying cotton thread weaves through the shirt from the computer to flexible panels in the jersey.

The panels use electro-luminescence, a brightly-glowing technology previously used in advertising displays or on T-shirts worn by ravers at dance parties.

Panels on the shoulder of the shirt indicate a player's foul count. As the player scores more points a 'bar graph' rises up the side of the torso, and chest panels light up when one minute of game time remains, or 10 seconds on the shot clock. A panel on the back lights up on the shirts of the winning team.

Mr Page says tests of four prototype jerseys in real basketball games during the past few months showed great results.

"Players' awareness of the information was noticeably increased, and the spectators reported a large increase in knowledge and recall of the information," he says. "The athletes said when they saw the information, such as the one-minute warning, there was a sudden change in their behaviour — they could right away pick up their pace.

"It also made them more motivated, relaxed and confident when they could see that they were winning — which is something we didn't expect or design for. Also the referees and coach had to consult the (scoring) bench much less."

Mr Page plans to make more jerseys so he can see how it affects a five-on-five game. He sees great potential for the technology.

"We could do this for volleyball or netball or hockey or football and tailor-make it for those sports," he says. "If this was made commercially viable, maybe in half-time it could show advertisements. We could do things like showing physical endurance using body monitoring technology.

"In this project athletes didn't want to show things like fatigue and heart rate because they felt it would give the opposition an advantage. But spectators really wanted to know that kind of information.

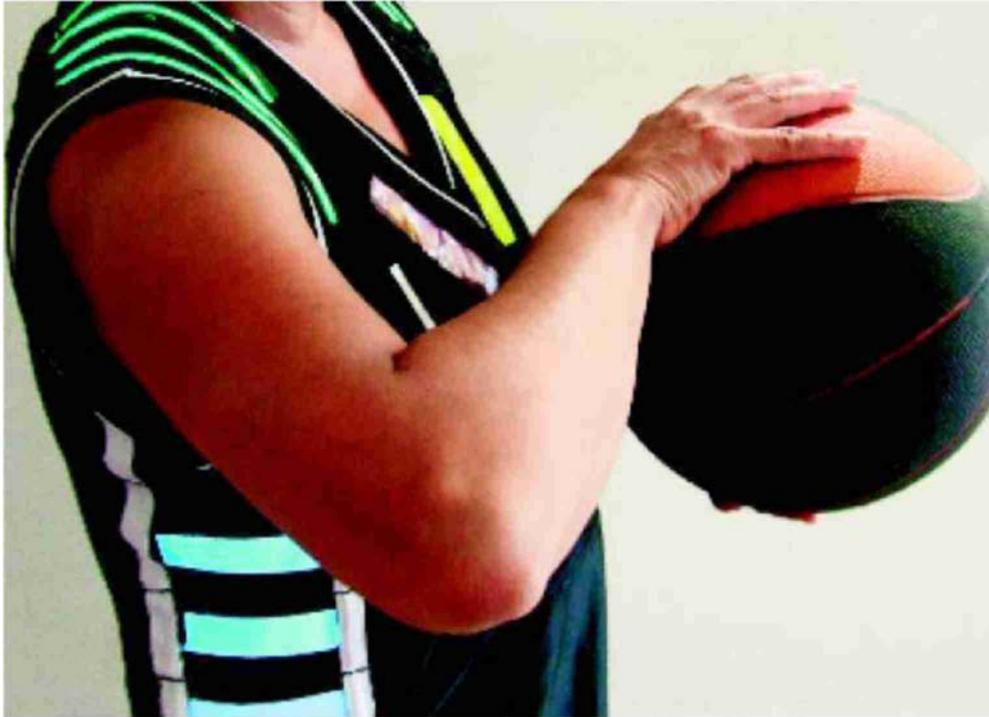"That kind of idea could be used as a training aid."

Further afield, this kind of technology could be used by emergency response teams, for instance firefighters who could communicate information through the heat and noise of an inferno.

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Electricity-carrying cotton thread weaves through the shirt from the computer.

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