

Robotic accuracy tested in kick-off with All Black great

September 14 2011



Massey engineering workshop technician Paul Thornton, Massey engineering student Maurice Tipene, Gustav Eiselen from Siemens, Massey workshop manager Eddie Rodgers and Associate Professor Johan Potgieter with the goal-kicking robotic leg.

(PhysOrg.com) -- A robotic leg developed by Massey University engineers will try to out-kick former All Black Andrew Mehrtens as part of an innovation showcase during Rugby World Cup next month.

The man-sized, muscular metallic leg might also upstage other players who have had less than consistent results in getting the oval ball over the goal posts in Rugby World Cup matches to date, says mechatronics lecturer Associate Professor Johan Potgieter.

"We know ball design is not to blame when it comes to goal-kicking accuracy, so we reckon our [robot](#) will be able to show what consistent goal kicking really means," he says, referring to Rugby World Cup goal misses, including by England player Jonny Wilkinson, which have made kicking accuracy a hot issue.



The robotic leg, modelled on a man of 95 percentile optimal physical health, was designed and built at the School of Engineering and Advanced Technology in Albany. It is one of two made by Massey engineers (the other is at the Manawatu campus), with a third made at Canterbury University. The trio of robots will be tested at Victoria Park, Auckland, on October 10 against legendary first five-eighths Andrew Mehrtens, as a precursor to the launch of the inaugural Robotics World

Cup at The Cloud on Queen's Wharf from October 11 to 13.

Dr. Potgieter says the challenges of making the solid aluminium life-sized leg, which is joined to a mannequin, centred on getting the anatomy and movement accurate through kinematic design and computerised modelling. He is confident the leg is a worthy match for Mr Mehrtens. "We'll just have to be careful not to hit the Sky Tower!" he says.

Challenge organizer Chris Hamling, national manager of Kiwibots New Zealand which runs VEX Robotics competitions in schools and the first ever Robotics World Cup next month, says the robots will take drop kicks at a goal from various angles and continue until a winner is declared.

"We'll start off as if a try has been scored directly between the posts and then the player and robot operator will go to the left and right of the post at certain intervals. Whoever converts the highest number will be the winner."



The robotic leg from the Albany campus is powered by pneumatic hoses, which are controlled by a Siemens XYZ programmable logic controller. It was made with the help of three visiting French engineering interns from Ensil, a state-owned advanced engineering school in Limoges, and local students. The project has enabled students to adapt knowledge and skills they learn through engineering and design to the specifics of a kicking robot, says Dr. Potgieter. Robots like this one could be used in the testing of sports equipment such as rugby balls, he says.

The robots will be on display during the Robotics World Cup as part of the Rutherford Innovation Showcase at The Cloud featuring New Zealand's information technologies and high-tech industries.

Using the American-based Vex Robotics game model launched by

Massey University in New Zealand in 2008, the event will involve university and high school teams from around the world and New Zealand designing, building and maintaining robots that compete in a game of speed, strategy, skill and adrenalin.

Provided by Massey University

Citation: Robotic accuracy tested in kick-off with All Black great (2011, September 14)
retrieved 3 May 2024 from

<https://phys.org/news/2011-09-robotic-accuracy-kick-off-black-great.html>

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