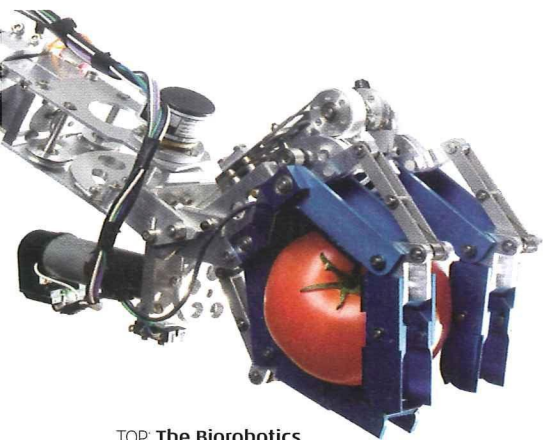


# RoboSport

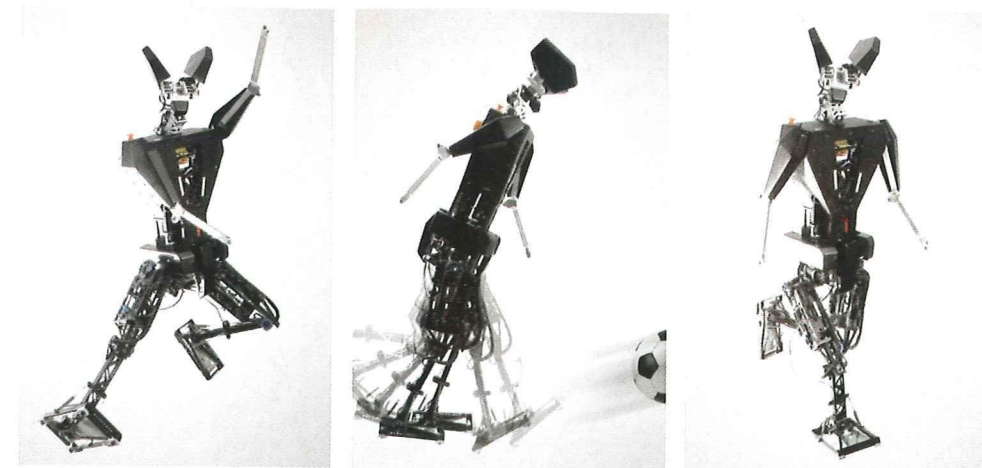
It's not rocket science anymore. The cool science of today is robotics. So what can we expect? *Holland Herald* headed to the Delft Biorobotics Lab in The Netherlands to find out

**Robots.** In science fiction blockbusters they are often portrayed as sinister, trying to enslave the human race through a superior physique and artificial intelligence gone haywire. Their creators are, according to Hollywood, a bunch of frustrated, power-hungry scientists as devoid of emotion as their robotic offspring. And yet, upon entering the Biorobotics Lab, which is located in the basement of Delft University of Technology (TU), everything looks remarkably innocent.

No crazy scientists here. Just a handful of students working on a headless robot called TUlip. It's being developed in conjunction with Philips and two other Dutch universities in Eindhoven and Twente. The head is lying on a table somewhere in a corner, it's the body they're interested in for now. At the tap of the keypad, a robot leg jolts forward. "We're finding out how to deliver the best



TOP: The Biorobotics Lab expects to see something similar to this hand being used to pick fruit soon  
RIGHT: A computer animation of a robot footballer



Creating robots for entry into the RoboCup is about more than just their footballing skills

kick," one of the students, Arjan Smorenberg, says. Why would a robot need to kick? Maybe it isn't all so innocent.

"It's for the RoboCup," robot researcher Freerk Wilbers says. RoboCup is an annual international robotics competition whose ultimate goal is to develop a humanoid robot team that can win against the world football champions by 2050. Hang on a minute. Football? So the engine driving developments in cutting-edge robotics departments across the world is nothing more hi-tech than a game of football? What about robots that can perform surgery, or help around the house? Of all their possible applications, somehow robots scoring goals never figured in my vision of a future utopia.

Nevertheless, since its inception in 1992, RoboCup has grown into a huge

Words: Annemarie Hoeve. Photos: David Joosten



event, with over 300 teams. "Of course it's not really about football – football is just the stimulus to see how far we can go. If a robot is advanced enough to play football, it can also do a lot of other things," Wilbers says. Student Yutaro Takahashi is also working on TUlip. He's wearing an orange Total Football track jacket. "Hopefully it will be ready for its first steps soon," he says. They still have a long way to go before the RoboCup in Graz, Austria, this summer. Last year's entry, Flame, is still in his blue flight case. He clocked up a few Air Miles on his way to the 2008 event in China, but lost to a Japanese competitor. This year, the Dutch team is determined to win.

There is more to this department than just football, though. They have developed a robot arm, complete with two moveable fingers and a thumb that can grab a ball or a tomato. Its design was based on the human hand, which is why this is called the Biorobotics department: they look to biology for design inspiration. Wilbers expects to see similar arms being used soon to pick fruit in greenhouses.

Throughout the lab, various prototypes portray the leaps and bounds robotic science has made since the lab was founded ten years ago. The oldest model has four legs and weights stuck to it with masking tape. A few prototypes later and I meet

Denise. "It's the first one we made with knees so we called her *De-knees*," Wilbers explains. Despite her accomplishments in walking, she only has an empty blue plastic bucket for a head. "We try to make their appearance match their abilities. We don't want to make them look too intelligent, because they aren't – yet," Wilbers says. He explains how they focus on smart mechanics rather than relying on lots of processing power and energy, because in the end, it's a lot more efficient.

So these robots may still be a few chips short of an IQ, but what does the future hold? "In 50 years, I think robots will be taking over a lot of things currently done by people: helping to build houses faster, working in the food industry, cleaning rubbish from the streets. They really are the 'next big thing'. I think one of the biggest challenges will be to come up with robotic solutions that are as smart and elegant as we are," says Wilbers.

In his office, an army of toy robots of every description is assembled on the shelves. He shrugs. "You get them as presents." He grabs a very un-android wooden duck. "This is the basis of making robots walk." The duck's feet propel it down a ramp one step at a time. It's all about the right proportions. "It looks like Carl Jung was right: "The creation of something new is not accomplished by the intellect but by the play instinct... The creative mind plays with the objects it loves." And whether that is a wooden duck, or a football, it seems that somehow you end up with some rather cool robots. ◀◀

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