

Brains on WHEELS



Left: Roboni-i, a wheeled robot with formidable computing power that takes gaming to a whole new level. Above: Robonica founder and CEO Johan Poolman with early prototypes of the robot. Opposite page, bottom: The remote controller with the Roboni-i robot connected to a PC via USB.

Right, from top: A screen shot showing the Command Centre software being used to "tune" the robot; the programme editor; a view of the lunar base in the game's online world.



We foresee trouble. South African start-up Robonica has pioneered and launched a robotic gaming system for children just in time for the year-end gift season. It's clever, it's quirky and it's highly addictive. Our question: once their parents have tried it, will the kids get a look-in?

Targeted at children aged 13 and up, and equipped with all of 16 sensors, Roboni-i is a fully programmable wheeled robot that adapts "his" behaviour to avoid obstacles, interact with other robots, neutralise threats, race against time – or simply because he feels like it. The Command Centre application allows the player to program the robot, design new games, formulate rules and access an animated tutorial. It gets better: the system comes with a remote that controls the robot in online games or missions – for example, in operations around the LunarCorps settlement, where your task is to save the world from destruction (you know, standard action hero stuff).

PM spoke to Robonica founder and CEO Johan Poolman, a man whose passion and belief in the product has driven the project from "cool idea" to something with extraordinary potential.

PM: You've referred to the inability of the current crop of radio-controlled and robotic toys to provide structured and interactive play, as well as to your frustration with the "intangible realities" of video games. Would you please elaborate, and explain how your company's first product will address these issues.

Poolman: Radio-controlled toys and most entertainment robots suffer from the same fate – one-dimensional entertainment with no repeat play capabilities. The current crop of entertainment robots, in particular, sells mostly on account of their high-tech novelty value, but generally fail to entertain once the novelty wears off. They employ increasingly sophisticated robotics technology (obstacle detection, voice recognition, autonomous behaviour, etc), which enables them to behave intelligently as

autonomous free-roving "agents" or even to adapt their behaviour as "artificial life forms".

But the entertainment experience they offer is in most cases limited to observing the robots in action; they simply fail to entertain on a repeatable and sustained basis – aptly illustrated by the recent demise of the sophisticated Pleo robot dinosaur. PC and video gaming, in contrast, provides sustained, repeatable entertainment with its immersive fantasy worlds and structured forms of game play. Even board games provide repeatable and structured game play and are still going strong after all these years.

Video gaming, however, by its very nature, is low on social interaction and group dynamics, and remains in a sense

constrained by its intangible virtual realm and synthetic approach to experience. The opportunity therefore is to somehow combine the structured game play of video and board gaming with the novelty and sophistication of robotics. Which is exactly what we set out to achieve with our Roboni-i Action Games product: combine interactive and structured game play with state-of-the-art robots – real-world robots that provide the user with physical evidence of cause-and-effect and an unquestionable sense of reality.

PM: Is the system's software likely to be tweaked regularly as users (and Robonica) explore its potential? If so, will the system allow an online upgrade?

Poolman: Robotic gaming is uncharted territory – there are no precedents or other products that can be learned from

or copied; so yes, the product's software will have to be updated on a regular basis. We anticipated this, so we have implemented state-of-the-art patch-updating technology that will perform an automatic background update of the PC-based Command Centre software as well as the robot's firmware whenever the user goes online.

PM: What makes the Roboni-i system so exciting?

Poolman: Roboni-i is in a sense the evolutionary next step for entertainment robotics – it uses advanced robotics technology to provide interactive, socially entertaining and challenging gameplay. Users can play stimulating single player games with real-world robots on their own, competing against the robots'



built-in game engines to improve their best scores. Or they can play competitive and entertaining team games against one or more of their friends – which in my book amounts to the ultimate social and interactive electronic entertainment experience.

Alternatively, they can connect their robots via USB to their PCs and use their remote controllers to control avatars of their robots in a virtual world where they can earn a virtual currency, compete in multiplayer games against other online players, or participate in online missions.

The entertainment doesn't stop there, though. Roboni-i is a fully programmable robot with four processors and a host of sensors. The PC-based Command Centre software comes with a novel program editor that will enable even kids to program every facet of their robots. The robot uses infrared for obstacle detection and situational awareness, RF (ZigBee) for peer to peer inter-robot and robot-remote communication, and RFID to interact with a number of game accessories. And it comes bundled with its own fully programmable robot personality and will roam around and explore its environment if left alone for too long.

PM: *Have you given any thought to open-source elements of your system?*

Poolman: The PC-based Command Centre application is based on Microsoft's proprietary .NET technology. The Roboni-i firmware, however, involves an advanced proprietary operating system that allows multiple applications to be dynamically loaded and executed – applications such as the robot's customisable personality, robotic games and reflex programs written by the user by means of the Command Centre software.

Since the development environment of the robot is based on the standard open source Gnu toolset, users will in addition be able to write their own applications using freely available open source tools when we eventually release our SDK – planned for early 2010. This will allow users to develop some pretty sophisticated applications that will have full access to the robot's Atmel, ZigBee and RFID processors as well as all the sensors and actuators. Applications such as swarming will not be too far-fetched.

PM: *Do you foresee a time in the near future where Roboni-i users will compete in regional, national and even international tournaments? Where and when will this start?*



Robonica's Johan Poolman with production manager Philip Engelbrecht and the first product off the assembly line. The company is presently producing the game at the rate of one a minute.

Poolman: We have been organising matches and tournaments on a small scale for quite some time as part of our domestic play testing programme. Team games and matches in particular have proven to be an absolute entertainer, with parents in the audience sometimes getting more worked up and excited than their kids!

A tournament programme is very much a fundamental part of our product's design philosophy; we have even developed a tournament management system (Spectator) that displays game analysis and game state information such as game time left, score, bullets, fuel, SFX, etc via a data projector on a wall so that the audience can be involved. We'll kick off with the domestic regional and national tournament series in March to May 2010, and tournament series will start in the US during the course of 2010.

PM: *We understand the United States is your biggest target market. Any forecast of sales volumes?*

Poolman: The way to recover the investment required to develop robots, software and virtual worlds of this sophistication, as well as the considerable expenses associated to gearing up for mass production, will be to sell the products in large quantities – which can only be achieved through aggressive sales in the international market. The US is still the world's largest consumer of entertainment products, and sets the trend when it comes to interactive entertainment and consumer electronics. So yes, the US will be our biggest target market.

PM: *Do you have any obvious opposition in the US?*

Poolman: Due to its unique combination

of technology, Roboni-i competes to some degree in a number of market segments, including those for radio-controlled toys, entertainment robotics and interactive gaming, so we can expect competition from each of these sectors. We are, however, pioneering a new product category called 'robotic gaming', in which we don't have any competitors – yet.

PM: *Will the Roboni-i system be available in local stores in time for Christmas?*

Poolman: Yes. Roboni-i Action Games are available from selected Toys R Us stores. *(Editor's note: The Roboni-i Action Games starter pack, which includes the robot, remote, game accessories, resource cards, Command Centre software and free access to the Roboni-i Online World, retails for R1 495.)*

PM: *Can you provide any hint about your next product?*

Poolman: Robotic gaming and online integration is the future – we have a number of related product concepts on the drawing board.

PM: *Do you expect customers to refer to Roboni-i as "it" or "him"? How about you?*

Poolman: We expect our users to refer to Roboni-i as a "him" or "her". Roboni-i has a cute personality, so we tend to agree...

PM: *Would you please detail some of the challenges you faced along the way – learning curves, software glitches (and their results)... that kind of thing?*

Poolman: The most significant challenge we were faced with had to do with getting the necessary funding to make the project work. Developing a product of this complexity – not only robotics, but also gaming, application software and online worlds – requires a huge up-front R&D investment, and setting up a factory and opening up the highly competitive US market require even more. So it took some considerable convincing and plenty of presentations to potential investors to get this show on the road.

The other challenges we had to deal with had mostly to do with the uncharted territory we are operating in. Robotic gaming is a brand new and totally unproven concept; only time will tell whether this will be a passing fad or a new, successful entertainment genre. **PM**