

# More humane than human – MiRo-E

Animals and machines are beginning to converge, robotics is finding more human applications and MiRo-E is the best of what we can currently achieve, *ET staff*

**M**iRo-E loves a bit of attention, offer up a back rub and he'll show his appreciation by nuzzling your hand, wagging his tail and looking up at you with those big soulful eyes, gently mewling happily and pulsing colours. Very soon you'll be the best of friends and MiRo-E will start recognising your face and voice and he'll always be excited to see you.

He's also great in a crowd, put MiRo-E with people and he'll quickly be the centre of attention, MiRo-E's undeniably cute,

somewhere between a rabbit and a puppy, and with his little neckerchief – there is a range of neckwear available, MiRo-E loves to accessorise – he's pretty irresistible.

But it's the way that MiRo-E reacts and interacts with others that's really engaging, there's something there that's familiar and genuine. The charm is no accident, MiRo-E represents a high point in robotics and is at the bleeding edge of bio-mimetics, the replication of mammal behaviour in machines.

To make it all happen there needs to be a lot going on underneath the bonnet and that has been the work of some of Britain's



MiRo-E is nothing if not social

best brains in robotics, psychology and industrial design.

Sebastian Conran, Co-founder Design of Consequential Robotics who produce MiRo-E is one of those brains, if you don't recognise the name you'll more than likely have something he made in your house, Conran has long been one of Britain's leading industrial designers and has an arm's length list of academic bona fides.

He says, "The things you would expect a humanoid to do; give immediate intelligent answers to questions, pick something up from the floor, pour you a cup of tea we simply still can't do in robotics, not even with oodles of money. But what we can do is replicate a small mammal, pet like object and we can give it, using currently available technologies, behaviours which are fairly similar to a small rabbit or a kitten or puppy. We're not talking about a fully grown animal, more a toddler age.

"What do we expect from a pet? We expect it to be playful, everyone talks to their pets, we don't expect the pet to talk



back but we're delighted when the pet can actually respond to what we say."

The robot had its beginnings at the University of Sheffield and was given a number of features that suit it to many different uses, MiRo-E can be used to study

animal behaviour, used as a companion robot or in education; the thing is MiRo-E is still something of a blank canvas and Consequential Robotics are always curious about and receptive to new ideas and applications.

"We call these robot devices 'platforms', what we've produced is much like a laptop with no applications on it, it's a mobile computer that can see around the place, find its way around your home and it can be programmed.

"We have a simple programming system called the MiRo-E Educational Interface which we're currently developing, it will be finished by January with a preview launch in October," he says.

This iteration of MiRo-E is the third generation, while they've all been outwardly similar, the mechanics and mechatronics are vastly different. The last version, the MiRo-Beta, was aimed solely at university robot developers, people who weren't afraid of soldering irons and code. That has evolved to a modular design for

AUSTRALIA'S LARGEST PERFORMING ARTS EVENT FOR SCHOOLS

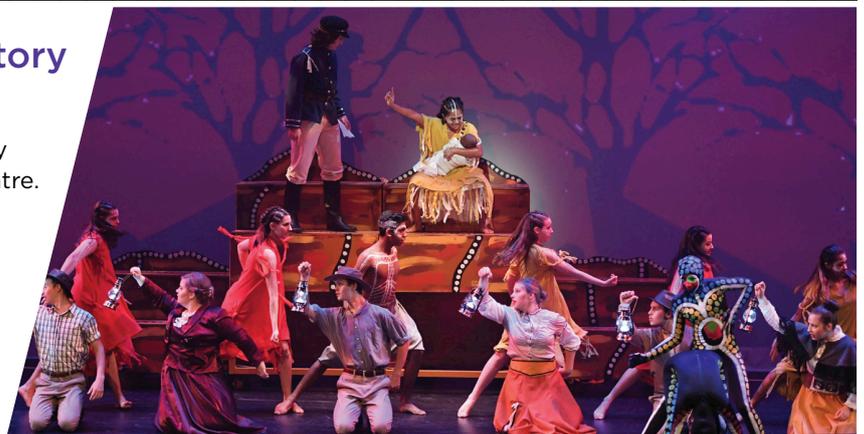
Wakakirri means 'to tell a story using dance and drama'.

Your students will create a 3-7 minute Story Dance and perform it in a professional theatre.

Don't worry if you haven't got a teacher, we've got one for you!

Make your Wakakirri dream a reality with our Best Start Program. Just \$1500 for planning, choreography and 12 contact hours with up to 50 students.

THINKING ABOUT 2019? REGISTRATIONS NOW OPEN



WAKAKIRRI

Arts education at it's very best. Teaching at its most rewarding.

OUR PANEL



Contact us: info@wakakirri.com  
 Freecall: 1800 650 979 • wakakirri.com

### What's MiRo-E up to?



#### Next gen companion robot

Like companion animals and pets, robots have the potential to sustain long-term social interactions, be engaging, and offer spoken and physical comfort.



#### Human-robot Interaction

MiRo-E's strengths are its attractive animal-like persona, robust build and long battery-life. That means very real long term relationships can be built with the robot



#### School and University Teaching

MiRo-E can be used to teach everything from basic principles of programming through to computer vision, machine learning, robot control, psychology and biomimetic design.

this version of the robot so if parts fail they can be replaced, suiting it to more rugged use in classrooms.

"Inevitably there are lots of moving parts and friction wears components so we had to have a way that people can repair their robots simply and cheaply. We've designed it so it's very easily user serviceable, if you look at Pepper or Nao, if something goes wrong it's straight back to the vet, where this is much simpler and quicker.

"We've incorporated a Raspberry Pi 3B+ as the main processor which will make upgrading the intelligence of the robot and processing abilities relatively easy. "The other thing is that Raspberry Pi is directed at education, people will have those processors available so they will be able to upgrade the robot.

"We're not designing something that in two year's time will leave people stuck with the old model, you can just pop in the new engine. At the moment it is not self-charging but we're in the process of developing a self-charging kit," Conran says.

So, you get the idea, buy your MiRo-E once and watch it evolve as new tech comes online, while a long-term relationship between the creature and owner develops.

The robot as it exists now can be used

in classrooms very easily.

"We call the latest version 'evolved for education' so it is a consumer facing product whereas the previous one was just for developers. We're not trying to sell it for people to use in their homes but the future versions would be great for granny because she could have this little robot knocking around, like a little pet she could chat away to but it will notice if she is not looking happy."

"There are huge numbers of kids that want to know how to program robots and this is a sophisticated platform that they can practice on, we have MiRo-E simulator which is browser based which means you can program a MiRo-E on your smartphone or tablet, or computer.

"There is a lot of emphasis today on teaching kids to program, some are calling it the new Latin, except that coding probably a bit more useful. It's all very well coding but if you haven't got something physical that you can apply robotic coding to it becomes a bit abstract. The kids can learn the basics of coding and produce programs or what robotics people call behaviours and skills.

"To give every kid a high-quality robot, especially for state runs schools, is a big ask so what we're trying to do is suggest

they have one or two as they recognise and interact with each other," Conran says.

But you only really need one MiRo-E per class as all the kids can have a go at programming it using the open-source simulator software and then have a turn at running the programs they have created when it's their turn to use the physical robot.

If you need to investigate its capabilities at a deeper level, the MiRo-E can also run on Python and C++ or ROS (Robot Operating System) so universities and high-level students and researchers can hack it and bypass the education interface.

The current generation will be usable with people with cognitive and special educational needs like autism, and there is work currently being done in the area, but Conran says that there is still a lot of validation research to be done before any pronouncements can be made.

"If we're going to be using the robot in people's homes and with people with special needs we have to have a hack proof version. It could be used right now to notice if granny has fallen over and post a call to emergency services but before that can happen we need to tweak it so it can't be used inappropriately," Conran says.

Distributed in Australia by The Brainary

**All the latest STEAM news and thinking in Education Today's STEAM Report**

Monthly in your mailbox  
Subscribe at <http://www.thesteamreport.com.au/newsletter-form/>  
Using your .edu or edumail address

**NEW OFFICE  
NOW OPEN  
FOR SOUTH  
EAST QLD  
SCHOOLS!**



100	99	98	97	96	95	94	93	92	91
81	82	83	84	85	86	87	88	89	90
71	72	73	74	75	76	77	78	79	80
61	62	63	64	65	66	67	68	69	70
51	52	53	54	55	56	57	58	59	60
41	42	43	44	45	46	47	48	49	50
31	32	33	34	35	36	37	38	39	40
21	22	23	24	25	26	27	28	29	30
11	12	13	14	15	16	17	18	19	20
1	2	3	4	5	6	7	8	9	10

# ProjectPlaygrounds

## The Ultimate Thermoplastic Playground Markings

**Transforming your old and tired Playground into a World of Colour, Education and lots of Fun!**

Project Playgrounds is Australia's number one provider of fun and educational thermoplastic playground markings – we have installed our fabulous product in over 100 schools nationwide.

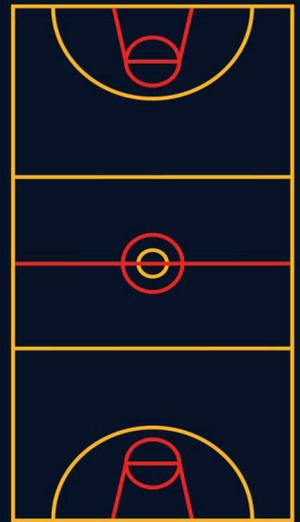
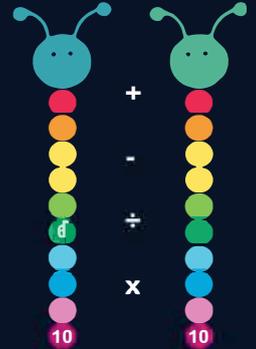
We have a multitude of literacy and numeracy focused playground markings and games – from Alphabetic Snakes to Calculating Caterpillars, as well as traditional board games and Hopscotch – all fantastically colourful and manufactured to fit into the valuable playground space available to you.

Our thermoplastic is the best in Australia and we stand by our quality product. As such, both our product and installation come with guarantees and we will not be beaten on price either – we will price match any competitor because we want you to have the best! .

Our markings are applied to the concrete or bitumen surface using extreme heat and once cool (after approximately 10 minutes) they are immediately ready for use by the children. Forget about paint or other forms of markings that take hours or days to dry rendering your playground useless for long periods of time.

Give your students the playground they deserve and contact us now for a free quotation. All of our standard designs and prices are available on our website and we will tailor a package based on your budget and requirements, providing you with excellent customer service along the way.

All quotations are supplied within 48 hours of your enquiry. 90% of installations are completed in 1 day or less. All markings are guaranteed and immediately useable by the children.



Netball/Basketball



**Don't delay! Call Today! 1800 264 307**

**[www.projectplaygrounds.com.au](http://www.projectplaygrounds.com.au) | [info@projectplaygrounds.com.au](mailto:info@projectplaygrounds.com.au)**