Diamandini
Mari Velonaki, 2011–2013

Exhibition during ALICE Awards eligibility period

Background
Diamandini is part of a five year research project (2009–2013) between artist Mari Velonaki and robotics scientists at the Centre for Social Robotics, Australian Centre for Field Robotics at the University of Sydney. The project is funded by the Australian Research Council (ARC) and is currently in its third year. Diamandini is a custom-made humanoid robot incorporating an omni-directional wheeled motion platform, cameras and computers for real-time tracking and installation control. The project aims to investigate human-machine interactions in order to develop an understanding of the physicality that is possible and acceptable between a human and a robot. The artist and her scientific collaborators believe that Diamandini will directly benefit the rapidly emerging field of interactive robotics, where effective human-robot communication is crucial.

Description
Diamandini is an interactive robotic artwork. She is 155cm high, unrealistically slender, youthful in appearance although her exact age is uncertain—she could be between 18 and 30 years old. Diamandini’s look derives from an amalgamation of elements of classical sculpture with futuristic undertones. She is entirely made of a homogeneous porcelain-like material that makes her look more like a floating figurine than a robot.
Spectators can enter the installation space where Diamandini is moving about in a smooth, choreographed manner. Her movement is accompanied by soundscapes generated from within her. When a spectator approaches her, she responds physically by turning towards the person and gently moving closer to them or by avoiding the person and floating in the opposite direction.

Describing her desire to create Diamandini, Velonaki says “We live in a technology-driven world. I didn’t create Diamandini to proselytise for robots in one’s living room, yet as robots rapidly emerge from laboratories into society, my role as an artist (I am tempted to say) is to question, to provoke and hopefully, occasionally to inspire.”

The dialogical approach taken in this project between the audience and Diamandini is that of physically sharing and negotiating the gallery space. This negotiation between the two parties can lead either to notions of trust or to complete alienation. For Velonaki as an artist, the challenge is to create a female humanoid robot that simply does not resemble a female humanoid robot. When people first meet Diamandini, Velonaki wants them to experience a new aesthetic approach to what a robot can be. She wants to intrigue them as to how a robot can behave, saying “I strive to create a robot that doesn’t look or behave like a robot”. Diamandini is a work that aims to both address and confront notions of representation, interpretation and placement within contemporary art.
Future development

*Diamandini* is currently in the first cycle of her development. In the next cycle each of her arms will gain four degrees of freedom only, giving her just enough ability to gesture symbolically without being overly realistic and therefore causing her to lose her classical sculptural appearance. Diamandini’s autonomy will be extended to include the ability to initiate physical interaction through touch, including gently embracing a participant.

**Media:** Autonomous humanoid robot; omnidirectional motion base, servomotors, control computer with wireless Internet communications, battery packs, custom fabricated stereolithographic shell with porcelain finish.

**Dimensions:** Robot 60 cm x 60 cm x 155 cm, installation space variable.

**Credits**

Scientific collaborator
- David Rye: Robotic systems design

Implementation team
- DC Bandara: Power electronics design
- Mark Calleija: Omnidirectional base design, electronics and wiring
- Cedric Wohlleber: Lead programmer
Realisation of Diamandini was supported by

- Australia Research Council
- Centre for Social Robotics / Australian Centre for Field Robotics, University of Sydney
- New South Wales Ministry for the Arts

Technical Requirements

Diamandini is self-sufficient once installed. The installation requires only a mains power supply 100 VAC to 240 VAC, 50 or 60 Hz.

Once installed the artwork is self-sufficient and requires no intervention apart from recharging the batteries in the robot each night. The work is started by turning on the mains power switch, and shut down or paused by pressing a button.

Web page for ALICE Awards

Diamandini on Mari Velonaki’s web site
http://mvstudio.org/work/diamandini/
Mari Velonaki has worked as an artist and researcher in the field of interactive installation art since 1995, driven by her fascination with the complex area of human-machine interaction. Her work begins from a series of interactive installations that engage the spectator/participant with digital and robotic characters in interplays stimulated by sensory triggered interfaces.

Mari has created interactive installations that incorporate movement, speech, touch, breath, electrostatic charge, artificial vision and robotics. For example, in *Unstill Life* (2000) for the first time the consumption of real apples is the interface between the audience and a projected character. In *Pin Cushion* (2000), a female character is projected onto a latex cushion. Large acupuncture needles are embedded into the character’s face. When the viewer touches the needles, the projected woman responds and evolves in real time in response to the latent charge on the viewer’s own body. This work was the first to provide an individualised interface measuring each participant’s unique electrostatic charge.

In 2003 Mari’s practice expanded to robotics, when she initiated and led a major Australian Research Council art/science project ‘Fish–Bird: Autonomous Interactions in a Contemporary Arts Setting’ in collaboration with robotics scientists at the Australian Centre for Field Robotics. The Fish-Bird project has been recognised as an exemplary model of interdisciplinary art practice and cross-disciplinary research (arts/robotics) through case studies commissioned by both the Australia Council for the Arts and the Australian Research Council. Velonaki has actively advocated the need for a dedicated research space for Social Robotics in Australia. In 2006 she co-founded, with Professor David Rye, the Centre for Social Robotics, a centre dedicated to inter-disciplinary research into human-robot interaction in spaces that incorporate the general public.

In 2007 Mari was awarded an Australia Council for the Arts Visual Arts Fellowship in recognition of her body of work. In 2009 she was awarded a prestigious Australian Research Council Queen Elizabeth II Fellowship (2009–2013) for the creation of a new robot. This research investigates human-robot interactions in order to develop an understanding of the physicality that is possible between a human and a robot.

Mari is currently an Associate Professor and the director of a new lab, the Creative Robotics Lab, at the National Institute of Experimental Arts at the University of New South Wales. The Lab is now under construction and will officially open to interdisciplinary practitioners and researchers in 2013. The Creative Robotics Lab will provide a cross-disciplinary research environment dedicated to understanding how humans can interact with mechanical and robotic devices within the context of experimental arts and social robotics.

Mari’s artworks have been exhibited in museums, galleries and festivals worldwide.