DERMALAND by Jill Scott
Museum of Gestaltung ZURICH: 2009

DERMALAND Jill Scott (2009)
Neuromedia about UV radiation and its effects on our human skin and on our landscape

DERMALAND

Dermaland is a new interactive media sculpture by Jill Scott. The work was inspired by research into Artificial Intelligence and Neuroscience about the environmental influences on our human skin. Scott searched for a poetic metaphor about the human skin and the "skin" or surface of the Earth and Dermaland encourages further discussion about the effects of increased UVA and UVB light on these "skins". The public can use interactive magnifying glasses to investigate some of the effects of UV irradiation.

The surface of Dermaland is not only modelled on the Scanning Electronic Microscopic cellular construction of human skin cells, but the sculpture creates an "embodied" environmental stage. On this stage, Scott has scripted an emotional drama for robots based on dust mites who creep around and nourish themselves on epidermal and dermal skin cells. However, when day turns into night, the skin transforms into landscape based on the fragile ecosystem of the South Alligator River in Kakadu National Park (North Australia) and the robots see to represent our own machines hovering over the landscape. The side effects of unusually intensive sun irradiation and nuclear mining already threaten this landscape.

Credits and Partners:
Robots: Marc Ziegler: Artificial Intelligence Lab: University of Zurich, Programming: Nikolaus Völzow, Roman Haefeli Tracking: Wim Ton, Visual Effects: Christian Tanner, Andrew Quinn
Help: Marille Hahne, Juanita Schlaepfer-Miller, Scientific Consultants: The Dermatology Unit, Uni-Spital, University of Zurich, The Light Microscopy Centre and EMEZ The Electron Microscopy Center at the ETHZ, Zurich, Switzerland
DERMALAND: MORE DETAILS ABOUT THE PROJECT

Dermaland has raised public awareness by combining the care of skin with the care of our environment. Half land/half derma skin, the sculptural surface is a poetic metaphor that has been directly inspired by actual scientific research about skin disease and the embodied behaviour of our skin in relation to our immediate environment. The aim is to create cognitive associations, which may in turn help the public to understand more about human somatic behaviour of the Dermatome. The dermatome is a neurological term used to describe the cervical part of the spinal column and the efferent and afferent processes, which directly relate to the dermal and epidermal skin layers on the back of head, legs, neck, and arms. The 3D surface of DERMALAND has been inspired by images of the epidermis and dermis segments of the human skin that have been captured by the Scanning Electronic Microscope. On top of this skinscape, the viewer can move interfaces which trigger cellular and molecular images generated by the light microscopy, micro images about moisture generated with the HDTV camera and body parts which show the effects of UV radiation on exposed human skin.

Inspiring Images from the SEM (Scanning Electron Microscope)

These skin textures from human specimens are applied to the contours from a real landscape. In this case the landscape is the fragile ecosystem of the South Alligator River in Kakadu National Park in Northern Australia. Formerly, this landscape was a wetland but currently it is under-going ecological changes from new and unpredictable dry weather patterns. The projector over the top of the landscape is like a metaphor for the sun and as the light fluctuates between daylight and moonlights two scenarios are played out. By day, the audio visual information displays microscopic images about the effects of UV radiation on the dermal layer of the human skin and by night, the surfaces real trees and water emerge and “larger that life” dust mite robots roam the landscape in search of food.

Google shot: Original Landscape: South Alligator River. Kakadu. Australia

The viewers use magnifying glasses to investigative the layers beneath the skin of the landscape creating a parallel metaphor between the human skin and the skin of the planet. Although the project demonstrates how radiation can be both useful and destructive to human skin and to the growth of the landscape in differing ways, radiation is interpreted over the surface of the landscape surface of DERMALAND, sometimes the effects of two uranium mines, which in close proximity of the South
Alligator River (Ranger and Jabiluka). Both produce Yellowcake: $\text{U}_3\text{O}_8$ which emits a 414.4 nm wavelength. Standard UV radiations like UVA produce 400 nm - 320 nm, UVB- 320 nm - 290 nm and UVC- 290 nm - 100 nm. The video projector stands for the sun. There are two robots - based on the behaviour of dust mites, which roam over the surface of this landscape and trigger audio visual displays, and two magnifying glasses can be used by the viewers to shift the audiovisual associations.

Interface 1: Tethered Magnifying Glasses
By using a set of tethered mobile magnifying glasses the user can trigger audiovisual images, which change from daylight to dark conditions. These include enlargements of special sections of the landscape surface or associative affects on skin tissue as well as the condition of the landscape foliage. The skin images are derived from molecular and cellular mechanisms of tissue repair, with particular emphasis on the molecular mechanisms behind dermatitis and apoptosis in response to UV irradiation and the effects of radiation exposure on the skins basal cells.

Interface 2. Dust mite Robots
Dust mites belong to the family of eight-legged creatures called arachnids that also includes spiders, chiggers and ticks. They live off dry human skin and are hardy creatures that live and multiply easily in warm, humid places. The behaviour of the dust mites changes according to the humidity (or proximity
to the river) as well as to the wavelength of the radiation. Dust mites populations are very disturbed by high levels of UV radiation. They prefer temperatures at or above 70 degrees Fahrenheit with a relative humidity of 75 percent to 80 percent. They die when the humidity falls below 40 percent to 50 percent or when exposed to UV light, so they are not usually found in dry climates. About 200 mites can live in each gram. (A gram is about the weight of a paper clip.) Each mite produces about 10 to 20 waste particles per day and this waste cause nerve related allergies in humans. Egg-laying females can add 25 to 30 new mites to the population during their lifetime. In Dermaland, these two roaming robots graze on the skin-landscape. Projections follow the movements of these creatures and create different associations in relation to their daylight and night-time behaviours.

DERMALAND Sketches of the robot and the landscape- in production.

DERMALAND Time Sketches- showing the Projection and LCD screen potentials on the Landscape

DERMALAND Images from the light microscopes one can see projected on the landscape: (from left to right) Effects of UVB on Keratin cells in the dermis, Fremd proteins around the hair follicles, melanoma, and a histologies of sun blisters in the epidermis.
**Conclusion:**

*Dermaland* it is available for travel, and it allows for simultaneous interaction by users and by the robots, while users can employ tools to trigger the displays, the robots movements also trigger associated projections, which in turn control their behaviours. This project has been inspired by the author’s somatic work on an art and science project called *e-skin* (2003-2006) and by exposure to the microscopic images of skin from the (SEM) Scanning Electron Microscope, the con-focal microscope and a set of light microscopes at the ETHZ Zurich (2006-2008).

**Technical Construction:** ++ needed to be supplied by organization- rest to be transported from Zurich, Switzerland

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<tr>
<th></th>
<th>Description</th>
<th>Dimensions</th>
<th>Weight</th>
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<tbody>
<tr>
<td>1</td>
<td>1x Wooden stand with landscape</td>
<td>40cm high x 80cm wide x 48 high</td>
<td>120kg</td>
</tr>
<tr>
<td>2</td>
<td>3 robots (I spare)</td>
<td>7cm diameter x 7cm wide</td>
<td>18kg</td>
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<tr>
<td>3</td>
<td>LCD Screen ++</td>
<td>106x80x5cm</td>
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<tr>
<td>4</td>
<td>3 Mag glasses-one spare</td>
<td>4x5x6cm</td>
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<tr>
<td>5</td>
<td>Projector and ceiling mount ++</td>
<td>60x60x19cm</td>
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</tr>
<tr>
<td>6</td>
<td>Custom built tracking Camera</td>
<td>2x3x20cm</td>
<td>6kg</td>
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<tr>
<td>7</td>
<td>1x Media Player Shuttle With custom Linux software + 2 HDTV video cards</td>
<td></td>
<td>10kg</td>
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Total weight: 158kg

**About the artist:**

Jill Scott  
www.jillscott.org  
www.z-node.net  
www.artists-in-labs.ch

Jill Scott was born in 1952, in Melbourne, Australia and has been working and living in Switzerland since 2003. Currently she is Professor for Research in the Institute Cultural Studies in Art, Media and Design at the Zurich University of the Arts (ZhdK) in Zürich and Co-Director of the Artists-in-Labs Program (a collaboration with the Ministry for Culture, Switzerland) which places artists from all disciplines into physics, computer, engineering and life science labs to learn about scientific research and make creative interpretations. She is also Vice Director of the Z-Node PHD program on art and science at the University of Plymouth, UK-a program with 16 international research candidates. Her recent publications include: *Artists-in-labs Processes of Inquiry: 2006 Springer/Vienna/New York,* and *Coded Characters* Hatje Cantz 2002, Ed. Marille Hahne. Her education includes: PhD, University of Wales (UK) MA USF, San Francisco, as well as a Degree in Education (Uni Melbourne) and a Degree in Art and Design (Victoria College of the Arts). Since 1975, She has exhibited many video artworks, conceptual performances and interactive environments in USA, Japan, Australia and Europe. Her most recent works involve the construction of interactive media and electronic sculptures based on studies she has conducted in neuroscience- particularly the somatic sensory system, artificial skin (*e-skin* 2003-2007) and on neural and retinal behaviour in relation to human eye disease (*The Electric Retina-2008*) and Dermaland at the Musuem of Gestaltung in Zurich (2009).

**Private Contact:**

Prof. Dr. Jill Scott Hardturm Str. 132, 8008 Zurich Switzerland Mobile 0041 (0)79 5249211  Email: jscott@solnet.ch