The Midas project  PAUL THOMAS

The Midas project is a visual and sonic installation that amplifies certain aspects of experience at a nano level. The Midas project is analogous to the curse of the fabled Midas, King of Phrygia, to whom Dionysus gave the power of turning all that he touched into gold. This gift of touch soon changed for the king from a source of pride in his ability to a curse, as even his food and drink transformed into gold. The metonymic work is based on this Midas story, which parallels the transmutability of matter predicted by some nano scientists. As early as 1959 in his paper ‘There’s Plenty of Room at the Bottom’, Richard Feynman made social predictions concerning the potential of nanotechnology to transmute knowledge, stating that there ‘is enough room on the head of a pin to put all of the Encyclopedia Britannica’. Eric Drexler further explored these ideas in his 1986 book Engines of Creation: The Coming Era of Nanotechnology, in which he hypothesized on a ‘grey goo’ theory, suggesting that manipulating atoms could lead to a chain reaction where self-replicating nanobots became destructive. The action of the nanobots would call to mind the touch of the mythical King Midas. Bill Joy discussed these concepts of transference and transformation in an article in Wired magazine: ‘It is most of all the power of destructive self-replication in genetics, nanotechnology and robotics (GNR) that should give us pause’.

The Midas project uses the atomic force microscope (AFM), invented in 1986, and developed at the end of long line of optical microscopes introduced since the early 1600s. Robert Hooke (1635–1703) used the optical microscope to study living systems. Optical microscopes were used exclusively until 1931 when the first electron microscope was introduced. The scanning probe microscope (SPM) was introduced in 1981, leading the way for the scanning tunnelling microscope (STM) and the AFM. Optical microscopes have a number of limitations in that they can only image dark or strongly refracting objects effectively. The diffraction limits resolution to approximately 0.2 micrometres, and ambient light can diffuse the focus. Unlike previous microscopes, the AFM is not optical and therefore the name is a misnomer.

For the realization of this installation, Oron Catts and Ionat Zurr cultured skin cells on the substrates at the SymbioticA Research Lab in preparation for them to be scanned. The process of culturing skin cells was to create a unique set of samples from which to work, allowing me to explore various experiments with specific cells. The AFM uses a cantilever probe to touch the surface, reverting to a scanning process where an image of the surface is obtained by mechanically moving the probe in a raster scan of the specimen, line by line, and recording the probe-surface interaction via a laser being reflected on a photodiode. The AFM produces images of atoms, constructing a machinic visualization of the invisible. By scanning a skin cell with both a gold-coated and uncoated cantilever tip, specific recorded data for each event can be comparatively examined. Using the AFM in force spectroscopy mode, which only records the up and down motion of the cantilever, the transition of atomic vibrations between a skin cell and gold is demonstrated. The recorded data of vibrating atoms is translated into sound files to be presented in conjunction with a genetic algorithmic visualization of the skin cell. The algorithm is written to contaminate the skin cell’s image, replicating a Drexlerian deterritorializing landscape for semi-autonomous nano assemblers. In the nano world bodies that can be deterritorialized can be reterritorialized. The reterritorialization of atoms can be constructed from a bottom-up approach. In the same way, the binary code of digital culture is based on machinic deterritorialization and reterritorialization of data by digital devices. The machinic controls interpret and process the decoding of data into the manifestation of a thing as a co-conspirator, re-coding and re-translating. The encoded and decoded machinic interpretation implies a territory of continual re-translation as a reaction to chaos.

The Midas project uses the skin cell as a visual metaphor for exploring the deterritorialized and reterritorialized nanobiological body. In the installation semi-autonomous self-organizing nanobots affect the AFM’s imaging of the skin cell, transmuting it into gold. The experience of touch is represented in this process via the viewer making contact with a gold-coated metal skin cell constructed from a 3D plotted image. This action plays the sound of the atoms and releases nanobots, seeded from the recorded data. The digital sound for the installation presents the viewer with the AFM’s

4 It was Robert Hooke who published Micrographia (1665), in which he coined the term ‘cell’. When looking through the microscope at live cells of cork he was reminded of a monk’s cell in a monastery.

The Midas project.
Photo © Paul Thomas
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tactile analysis as an audible topographic map where speakers amplify the data of the atoms’ vibrations, making that which is infinitely small both audible and palpable.

To define a contemporary understanding of matter, Colin Milburn states at the inception of nanotechnologies as a scientific discipline that it ‘provokes the hyperreal collapse of humanistic discourse, puncturing the fragile membrane between real and simulation, science and science fiction, organism and machine, and heralding metamorphic futures and cyberorganic discontinuities’. Thus the possibilities of metamorphic and cyberorganic discourses being part human, part the surrounding space and part technology extends our spatial concerns in which the boundaries of the body become a signifier of an imagined particle relationship with the space between and enveloping us. The Midas project reconfigures perceptions of space and scale by constructing an experiential space. This space allows for exploration and questions, and further highlights the infinite smallness and the extent to which our perception of scale is of major importance in defining humanity. The sensorial analogy of touch to nanotechnology is confronted in a humanizing way through an immersive desire to be spatially connected to the world around us. ‘Nano art’ allows for a reconfiguring of our conscious understanding of space, which is our lived experience, generating the potential for new spatial understanding.

This project in collaboration with Kevin Raxworthy was assisted by Oron Catts and Ionat Zurr (SymbioticA), Dr Thomas Becker (Nano Research Institute at Curtin University of Technology, Perth) and Adrian Reeves (Department of Art, Curtin University of Technology, Perth).


### Re-thinking Touch

ZANE BERZINA

My research and practice evolves around explorations of the biomedical, interactive, tactile and aesthetic characteristics of human skin tissue. From both an artist’s and designer’s perspective I am fascinated by the dermis as a material, sensor, contact organ and medium for non-verbal communications. While our lives are increasingly surrounded with artificial intelligence and digital networks, I am interested in the directness of the skin – skin as an analogue system. Both the design of the sk-interfaces book concept and the Touch Me installation are organic continuations of this lengthy research process.

I have focused my practice-led study on the skin tissue as an intelligent natural material on the premise that it can serve as a model and metaphor for the development of responsive, active or interactive membrane systems which behave, look or feel like skin. I explore the epidermis in terms of biological chain reactions and mechanisms, aiming to translate ‘skin technology’, how it is engineered by nature and responds to external and internal stimuli, into my work. In the past decades skin as a highly complex ‘intelligent interface’ has increasingly served as an inspiration and model for concepts in design, art, architecture, technology and materials science to conceive surfaces and membranes that are flexible, translucent, functional, adaptive and responsive. Due to specialized material properties these systems may respond to pressure, sound, light, fluids, heat, electricity, chemical or mechanical stimuli. They are designed to interact with people and environments. Examples include responsive architectural membranes that can register noise levels in a building and translate them into visual colour-change displays on the outer skin of the building, sportswear with integrated thermo-regulating systems; self-cleaning and antibacterial surfaces; flexible textile membranes with interwoven mechanical and digital networks such as computer keyboards that can be rolled up, or textile systems with embedded sensors and actuators which can be used for medical body monitoring purposes for patients, reducing the need for hospitalization.

Despite my preoccupation with the technological and biomedical concepts of dermis, I constantly refer back to its poetic and social contexts as well as to the emotional aspects of the skin as a mirror of our mental states reflecting our emotions. There is a clear link between our skin and our nervous system, as ‘in the embryo, the skin and the brain are formed from the same membrane, the ectoderm’. I address this embryonic link between