The Search for Terrestrial Intelligence.

The S.T.I. Consortium (edited by Mike Phillips).

This paper discusses the work of the S.T.I. (The Search for Terrestrial Intelligence) Consortium. S.T.I. turns the technologies that look to deep space for Alien Intelligence back onto Planet Earth in a quest for 'evidence' of Terrestrial Intelligence. Using satellite imaging and remote sensing techniques S.T.I. scours the Planet Earth using similar processes employed by SETI (the Search for Extra Terrestrial Intelligence). Looking at Earth from space the project has developed software techniques, which incorporate autonomous agents. In their collaborative search for evidence of intelligence the agents generate new images, animations and audio, which often produce more questions than answers.

Key words: Artificial Eyes, Archetypal Images, Face on Mars, Satellite Images, Terrestrial, Intelligence, Scopophilia,

Figure 1: The Search for terrestrial Intelligence Logo.

1: The S.T.I. Consortium.

The S.T.I. Consortium was initially funded through a research and development grant provided by SciArt organisation (founded by the Wellcome Trust, The Arts Council of England, The British Council, NESTA, The Scottish Arts Council and Calouste Gulbenkian Foundation), and more recently through the Institute of Digital Art and Technology. The S.T.I. Consortium brings together artists, scientists and technologists from a number disciplines and international research Centres to collaboratively develop software agents that analyse satellite images (the product of digitally captured dynamic data). In this way the project turns the technologies that have previously been looking into deep space for evidence of Alien Intelligence back on to our space in a search Terrestrial Intelligence.

The S.T.I. Project has been constructed by a Development Committee, which consists of eight individuals, they are: Mike Phillips (Project Co-ordinator), Geoff Cox and Chris Speed from STAR @ University of Plymouth: Dr Guido Bugmann and Dr Angelo Cangelosi from the Centre for Neural and Adaptive Systems (CNAS), @ University of Plymouth: Christa Sommerer and Laurent Mignonneau from ATR Media Integration & Communications: Dr Nick Veck: Technical Director, National Remote Sensing Centre. The S.T.I. system code(1) has been developed in association with limbomedia.com and Mei Cen. The OnLine version of the S.T.I. Project can be found at: www.sti-project.net

S.T.I. establishes a common ground for the consortium by sharing the collective knowledge of remote sensing, imaging technologies, autonomous agents (AI and Neural Networks), and On-Line interaction. The Project fuses this knowledge into a challenging exploration of planetary data analysis, through a process of experimental prototyping of a number of autonomous data analysis agents that reside on the S.T.I. website.

Vision dominates our culture and lies at the heart of scientific and artistic endeavour for truth and knowledge. Increasingly the dominance of the human eye is being challenged by a new generation of technologies that do our seeing for us. These technologies raise critical questions about the nature of the truth and knowledge they elicit, and the way in which we interpret them. The S.T.I. Project goes beyond the irony of the search for terrestrial intelligence on Earth by engaging with our understanding of the 'real world' through our senses, whether real or artificially enhanced. Will these autonomous systems 'know' the 'truth' when they 'see' it?

The S.T.I. Project engages in critical issues surrounding the shift from the hegemony of the eye to the reliance on autonomous systems to do our seeing for us. This shift has an equal impact on scientific processes and creative endeavour. By turning away from 'outer space' to an examination of 'our space' the project also engages public interest, as expressed in the popular imagination through science fiction (X files, etc), in the alien within our midst. Do we recognise ourselves when seen through our artificial eyes.

2: Outside Looking In.

The electron microscope and the radio telescope opened up new dimensions, but saturated with old ideologies we approached the vistas they provided with obsolete value systems and failed to translate our newly gained experiences into a cultural reality. More dimensions are unveiled, more realities are modelled, more truths envisioned and still our preoccupation with the 'image' leaves us unable to articulate them. In many ways the S.T.I. Project exposes the 'image' as the primary reason for this cultural aphasia. Perhaps, through these technologies, we are effectively turning away from the other, the outside and focusing on the us, the within, the visions that we carry inside.

There was a time when the integrity of an image viewed through a lens was deemed illusory. Its validity as a truthful representation undermined by the intervention of a layer of technology between the viewer and the object. The intervention of a glass between the eye and the subject provided a corrupting filter that tainted the truth of the image. And now our understanding of the material world is dependant on images viewed through technology, images of; the end of the Universe, faces on Mars, Earth, foetuses, bacteria, atoms, and even consciousness itself. In the

search for the 'image' as truth the precarious and ominous assumptions of alchemists, phrenologists and eugenicists are being replayed, all negligent of the fact that the image is a symptom of a complex process, the trace of an event or activity, a stain. The digital shrinking of space and time generates new temporal and dynamic spaces, traces and processes, which challenge the hegemony of the image. S.T.I. reveals the process by which these images are generated through a collaborative process that relies on the collective psyche. The view of our planet from space provides a unique and critical perspective. Attempts to envision the macro and micro levels of our existence are placed firmly in context.

From this perspective the evolution of our spatial-temporal perception can be seen to be dynamically linked to the technologies we use. The 'global embrace' of McLuhan's extended nervous system, through enabling electronic networking/broadcasting technologies gave the 'linearisation of time', another 'dimension', the ability to pass through many streams of 'geographical' time. Digital technologies enable the experience of synchronous and asynchronous interaction through time and space. These experiences and the new understandings that they inevitably engender cannot be reduced to the image. Attempts to reduce this new reality to two dimensions will inevitably result in an active denial of this new awareness. Images of the Earth from space, proof at last that the world is flat.

"Reality has always been interpreted through the reports given by images; and philosophers since Plato have tried to loosen our dependence on images by evoking the standard of an image-free way of apprehending reality. But when, in the mid-nineteenth century, the standard finally seemed attainable, the retreat of old religious and political illusions before the advancement of humanistic and scientific thinking did not - as anticipated- create mass defections to the real. On the contrary, the new age of unbelief strengthened the allegiance to images."
(Sontag, 1977)

The information contained within the S.T.I. images attempt to fertilise new thought through a collaborative investigation, and critique false assumptions that encourage a new scientific mysticism based on the worship of false information icons. Whilst such icons provide a glimpse of 'a' truth the illusions they reveal are dominated by an information aesthetic that renders them little more than highly gilded religious icons that disguise the truth, and worse still save the viewer the trouble of thinking about it.

3: Face to Face / Silver Screen to Pixel Mirror.

Figure 2 : The face on Mars as a family photograph (2).

"…the essence was not to be degraded, her face was not to have any reality except that of perfection, which was intellectually even more formal. The Essence became gradually obscured, progressively veiled with dark glasses, broad hats and exiles: but it never deteriorated."
(Barthes , 1957)

The blurred and faded images sent back by the 1976 Viking Orbiter have provoked some controversy. Well almost, the images them selves have little to recommend them, the blurred grey smudges reveal little to the naked eye, that is until they are digitally processed. The processing slowly reveals a skull like face that stairs blankly from the surface of mars. Devoid of Garbos' screen presence this alien 'artefact' is unmasked in the digital light.

" Officially dismissed at the time as a "trick of light and shadow", the Face was rediscovered by DiPietro and Molenaar, engineers at the Goddard Space Flight Center, several years later. During the course of their investigation, a second image of the Face that had been acquired under slightly different lighting conditions was found. Digital image enhancements of this second image revealed a bisymmetrical object having features suggestive of eyes, a ridge-like nose, and a mouth. Due to the controversial nature of the subject, their results were published independently of the planetary science community."
(Carlotto M, 1988)

The face that stares back at us from the photographs taken by the Viking Orbiter mirrors the projected face of Garbo. The mirror image we see, the face on Mars, also reflects the technology of image making that sustains Garbo. Projected on the silver screen Garbo's face attains a level of permanence that does not fade or deteriorate, whilst in reality the off screen face that is not permanently bathed in the youth and fame giving beam of cinematic moonshine is slowly veiled through time. On Mars the reverse happens. The permanence of these geographical structures, whether natural or intentionally configured, may suffer from erosion of the Martian landscape, yet the process employed to reveal them to us slowly unveils them. The technology strips away the grain and fuzz and re-visions them. The 'Essence' becomes gradually un-obscured, progressively un-veiled with features suggestive of eyes, a ridge-like nose, and a mouth: its 'truth' emerging through the technology. The processing techniques employed allow us to see more clearly the

images we nurture inside our heads, they bring into sharp focus the things we want to see. These tools that 'image' flatter our expectations and nurture our assumptions.
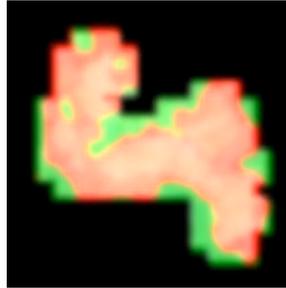
4: Hobbs End.

Figure 3: "Worm with a human head" (Anon)(3).

Pursuing these filmic reflections, is it just a coincidence that the primal fear, the spectre of Beelzebub, the archetypal image of our simian ancestors engaged by Professor Bernard Quartermass (Ward Baker, R. 1967) at Hobbs End should be the genetically engrained face of ancient Martians. In the S.T.I. search for terrestrial intelligence the collective consciousness is reflected through the software agents. Unlike the SETI at Home screen saver, which looks for alien intelligence by dispersing the search across the computers of the general public, S.T.I. uses the distributed intelligence of the public to collaborate with the agent software to agree what intelligence might look like. The process feeds of the satellite data provided by the NRSC. Through the S.T.I. web interface the user can scroll around an image and select a 'sign' of intelligence. This selection is then analysed, based on the distribution of colour of each pixel (the intensity values between 0 and 255 for the levels of Red, Green and Blue). The frequency of each colour is analysed and each pixel in the overall image is also analysed within an adjacent area of 5 x 5 pixels. Bayesian statistical methods are employed to test the probability that these pixels belongs to the same class as those from the selected area, and then compared against the probability that the pixel belongs to any point within the image. Once the whole image has been analysed potential areas are selected by defining the contour of any cluster of contiguous pixels belonging to the searched class. An optimum size cluster is presented through the web interface for the users approval and selection. Once selected the image enters the S.T.I. database where it is named. By building up a database of named images based on this search process future version of the software agent will allow the planets surface to be searched by name alone (as in figure 3).

The S.T.I. database is expanding rapidly. the project is mapping the planets surface and producing new data which may one day prove the existence of terrestrial intelligence. The system may be revealing the archetypal images of a collective consciousness or the genetically engrained images from a Martian colonisation. Whether this intelligence is recognised by the software agents or by their human collaborators when it is found is yet to be seen. The truth is in here. The search continues.

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Notes:

(1) The output from the S.T.I. project generally conform to the Open Source definition (Version 1.7), ie: free redistribution, distribution in source code as well as compiled form, allowing modifications and derived works, no discrimination against persons, groups or fields of endeavour, etc.

(2) Figure 2 : The face on Mars as a family photograph. Not the face on Mars but a family photograph composite taken from 'Narcissus v1.0' video for S.T.I., SciArt Symposium, Creating Sparks Conference, Royal Geographical Society, London.

(3) Figure 3: "Worm with a human head" (Anon) taken from the S.T.I. search engine database.

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