

The Gold Mine

Prof Nic Clear

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Project Description

The Gold Mine is a speculative architectural design project that consists of texts, drawings, models and an animation to propose a utopian city set in a post-scarcity, post-singularity future and located in the Thames Estuary on Canvey Island.

The Gold Mine uses concepts derived from architecture, literary science fiction, science fiction studies, theoretical and design precedents from 20th century avant-garde architecture alongside technological research into the emerging Nano-Bio-Info-Cogno (NBIC) technologies (Roco, Bainbridge 2003).

Project Duration:

2014 - 2020

Funder:

£6K from University of Greenwich funding as part of the AVATAR research group to support manufacture of model.

Research Partners, consultants, collaborators:

Project Team:

Project Concept, Exhibition Design and Text: Nic Clear.

Images: Nic Clear, Hyun Jun Park.

Model: Nic Clear, Hyun Jun Park. Michael Aling, Simon Withers.

Model base machined by Stringer Associates.

Video:

Directed, Written, Edited, Sound, Voice Nic Clear.

Computer animation: Hyun Jun Park.

Additional video material: Natasha Clarke, Kate Lynham, Nik Maksimenko, Tomi Owolabi, Seung Park, Sunny Qin, Gosia Starzynska, Neil St John, Alex Tarr.

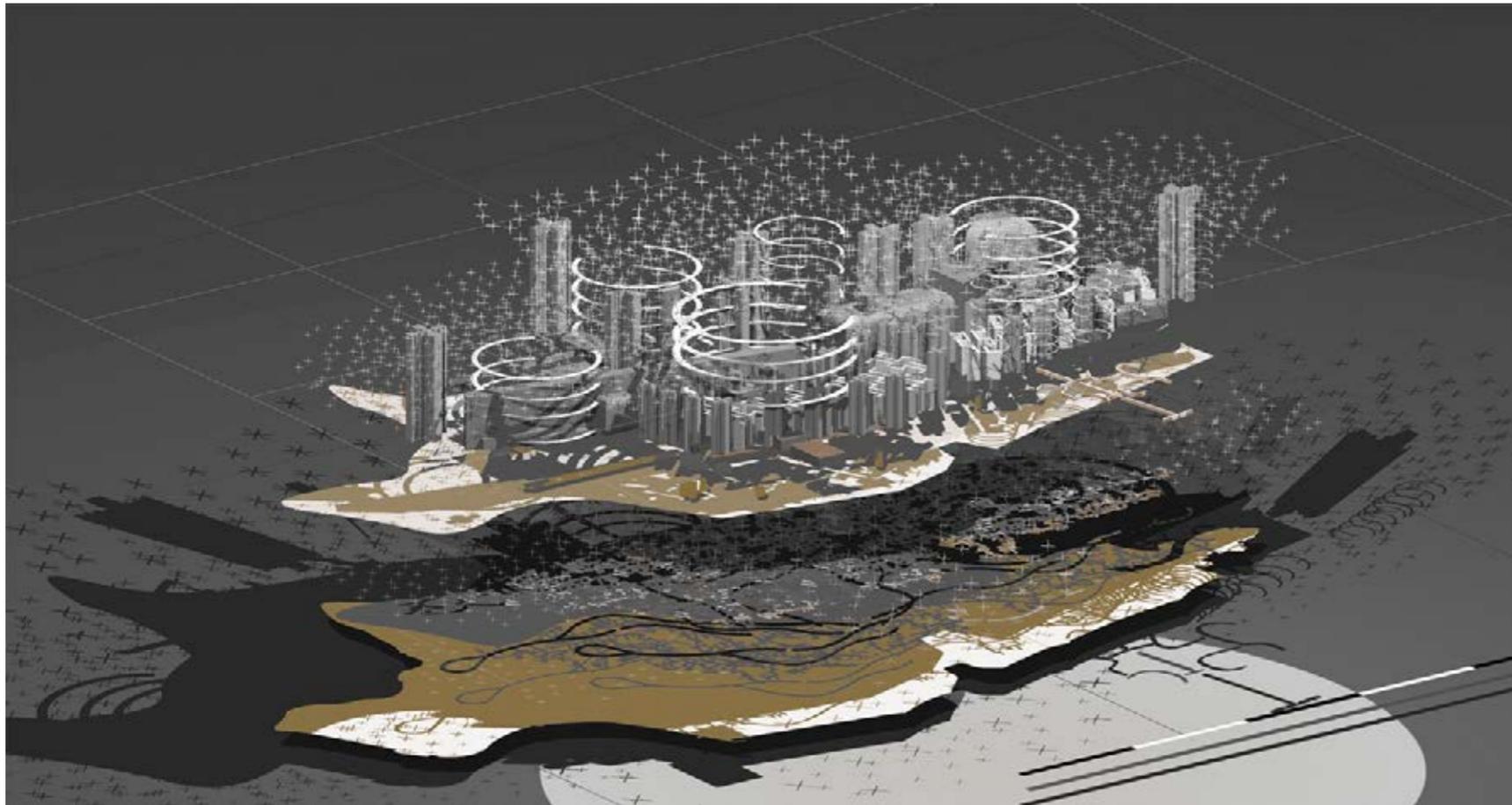


The Gold Mine: Concept Plan, (2014) Digital Print

Research Aims & Objectives

Research Aims:

- To create a piece of speculative design research that makes an explicit connection between the utopian traditions of science fiction and the utopian traditions of 20th-century avant-garde architecture through the creation of a futuristic architectural project 'as' a piece of science fiction.
- To explore the potential implications and implementation of technologies derived from research into the Nano-Bio-Info-Cogno (NBIC) technologies in the development of a proposal for a futuristic post-singularity, post-scarcity city.



Research Objectives:

- To create a futuristic design for a post-scarcity, post-singularity city principally drawing upon the author's scholarly writing, by incorporating references to the 'Culture' novels of science fiction author Iain M Banks and the 'New Babylon' project of Dutch artist Constant Nieuwenhuis (Clear 2013), alongside utopian architectural references identified in the author's contribution to the Oxford Handbook of Science Fiction (Clear 2014).
- To create an architectural design project 'as' science fiction, drawing upon Darko Suvin's concept of the 'novum' (Suvin 1972) and Frederic Jameson's contention that the 'utopian' tradition is a sub-genre of science fiction (Jameson 2005), thus focusing upon the shared lineages, subject-matter and concerns with concepts of 'newness' and futurity (Clear 2014) that architecture and science fiction share.
- To create a speculative design project that poses 'what-if' questions (Shaviro 2016) around the profound changes that will occur in the design of our cities following the introduction of the Nano-Bio-Info-Cogno (NBIC) technologies and the resultant transformations that will occur in social, political and spatial organisation.
- To use innovative iterative forms of 3D design, production and manufacturing to create drawings, models and animations to communicate the futuristic utopian ambitions of the project at a time when the concept of utopia is dismissed in architectural discourse.

The Gold Mine: Concept Axonometric, (2014) Digital Print

Research Context

Architecture and Science Fiction share a great many themes: newness, futurity, utopia, advanced technology, and yet both discourses tend to avoid explicit references to the other. In the 'Oxford Handbook of Science Fiction' (Clear 2014) the author explicitly proposes that much of the utopian architecture of the 20th century should be considered as part of the science fiction tradition. A second essay further explored this connection by comparing the thematic and formal similarities between the 'Culture' novels of Iain M Banks and Constant Nieuwenhuis's 'New Babylon' (Clear 2013), These two essays form the intellectual and formal armature for the Gold Mine project.

The Gold Mine manifests the concept of architecture as science fiction through an architectural design project that constitutes a speculative proposal for an advanced future city, posited as part of the utopian tradition. The Gold Mine is conceived as a thought experiment intended to re-ignite debates around issues of utopian urbanism and informed by technological advances that offer the possibility of a radically different conception of human society. The Gold Mine is seen as an alternative for urban design at a time when neo-liberal ideologies dominate our thinking on the city and their consequent impact on climate catastrophe (Klein 2014).

The design process of the Gold Mine uses methods of collage to develop ideas for both the CAD drawings and the physical model, utilising tactics of 'sampling', 'appropriation', 'and detournement' (Debord 1958), alongside the use of chance as developed through various Dada and Surrealist practices. Techniques taken from William S Burroughs' 'Cut-Up Method' (Burroughs, Gysin 1972) were also important conceptual driver.

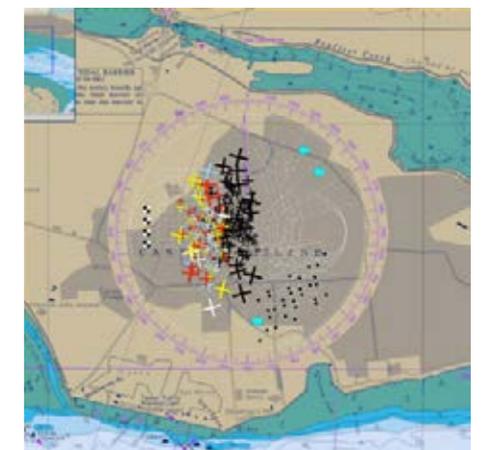
A number of factors made Canvey Island the ideal location for this 'what-if' experiment: the tradition of utopian settlements within the county of Essex (Meades 2013), and personal associations of the author growing up near Canvey with a particular interest in its cultural significance. The association of islands as part of the utopian tradition dating back to Thomas More's eponymous text (More 1516) was also significant (even if Canvey isn't a true island).

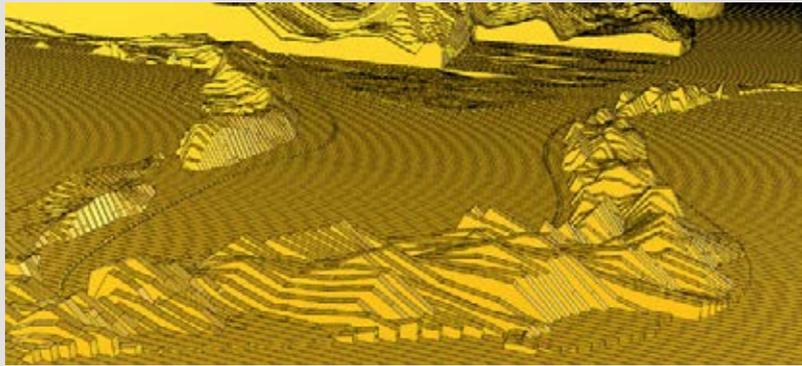
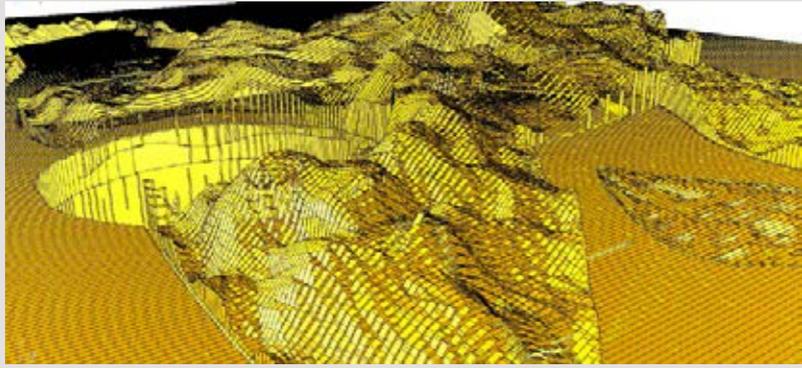
Nic Clear, Mike Aling, Hyun Jun Park-
Developing the Gold Mine Model
(2014) (Photograph: Simon Withers)



A key mantra for the project is 'Nothing is wasted' and this not only refers to physical resources, in terms of an ethical use of materials, but to human resources as well. The ability to operate at the nano-scale allows all materials to be re-purposed and through individually customised computing interfaces all members of society are encouraged to reach their full-potential.

(Left) The Great Southern Village (GSV), Location Plan (2014) Digital Print
(Right) The Gold Mine Swarm plan (2014-2018) Digital Print





The Gold Mine: 3D Terrain Model showing sectional slices (2014)

The Gold Mine model fabrication process (2014)

Research Methods & Process

The Gold Mine was commissioned for Loncon 3 by Events Division head and leading science fiction scholar Professor Farah Mendelsohn. It was decided very early in the project that the exhibition should feature a large-scale model of the city (4200x2400mm), alluding to a tradition of using such models in utopian urban projects.

The concepts for the exhibition were developed alongside a text that was presented at the Future Cities conference in Greenwich and a fuller version of the text was published in Architectural Design that outlined the technological and social context of the work, alongside a number of design drawings. The text which relied on research into the NBIC technologies was written in a style that blurred the distinction between the academic and narrative aspects of the project (Clear 2014b).

The text and the initial concept drawings were developed by the author and served as a principle reference throughout. The architectural plans were developed by collaging together a number of different architectural sources and then manipulated in a 3D modelling programme. The 'labyrinth' drawings were produced collaboratively and represented the virtual spaces of the new city.

The centrepiece of the Gold Mine exhibition was the physical model created in five sections showing the transformation of the Island as part of the post-singularity world. The model is constructed of 650 individual slices using CAD/CAM techniques from a 3D digital model and mechanically fixed together using threaded studs.

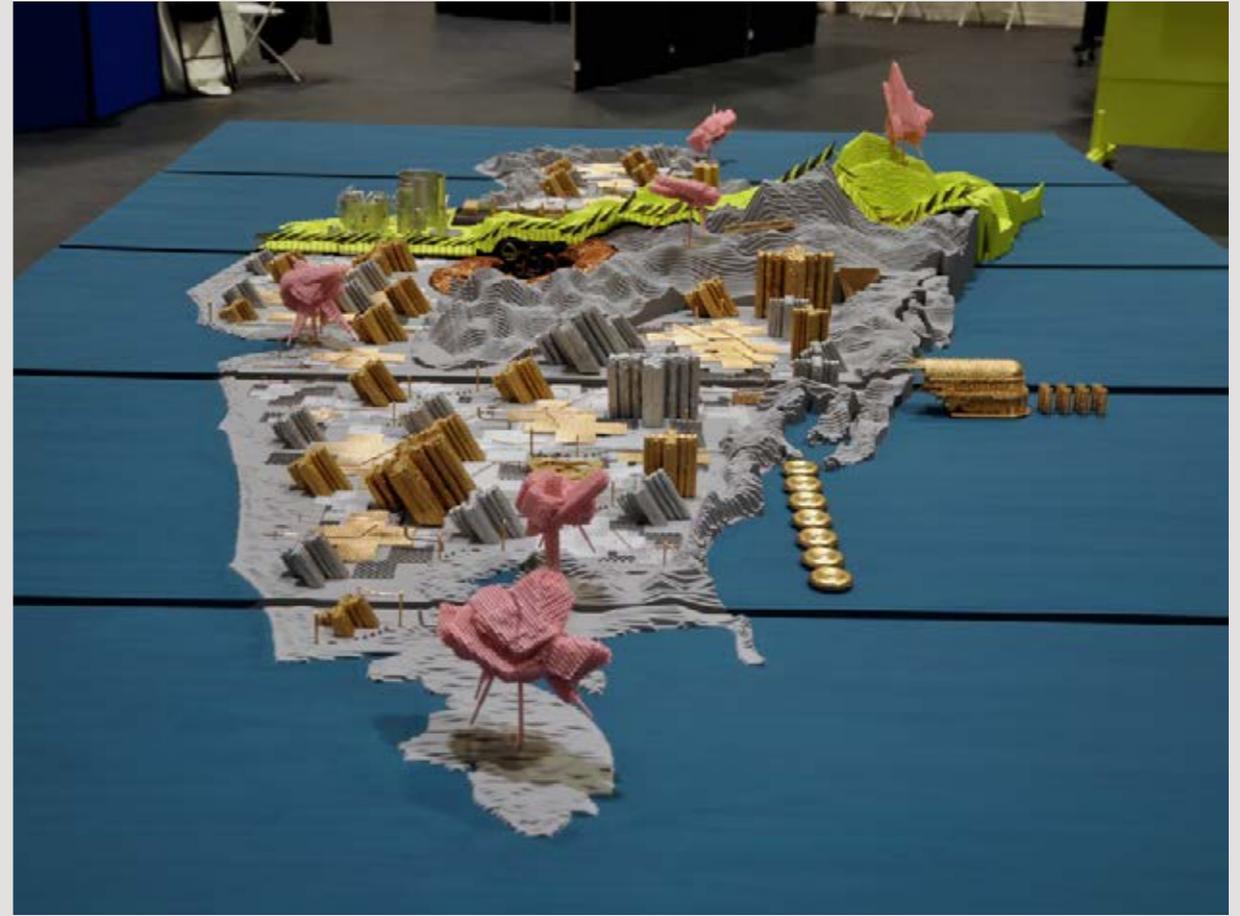
The model was created in collaboration with colleagues and constructed to show the detailed variations of the terrain, including a central caldera, with various additional structures added. The final details used bricolage combined with 3D printed models, resin cast models and re-purposed objet-trouvé, with the composition used to suggest a highly dense level of occupation. For subsequent exhibitions the model went through various iterations as it was refined to be shown in different contexts. The size of the model was important to give the project the necessary impact, although the need to create it as separate sections was for practical purposes

of fabrication and transport. The model was adapted a number of times for subsequent exhibitions and was even displayed as a wall-mounted piece.

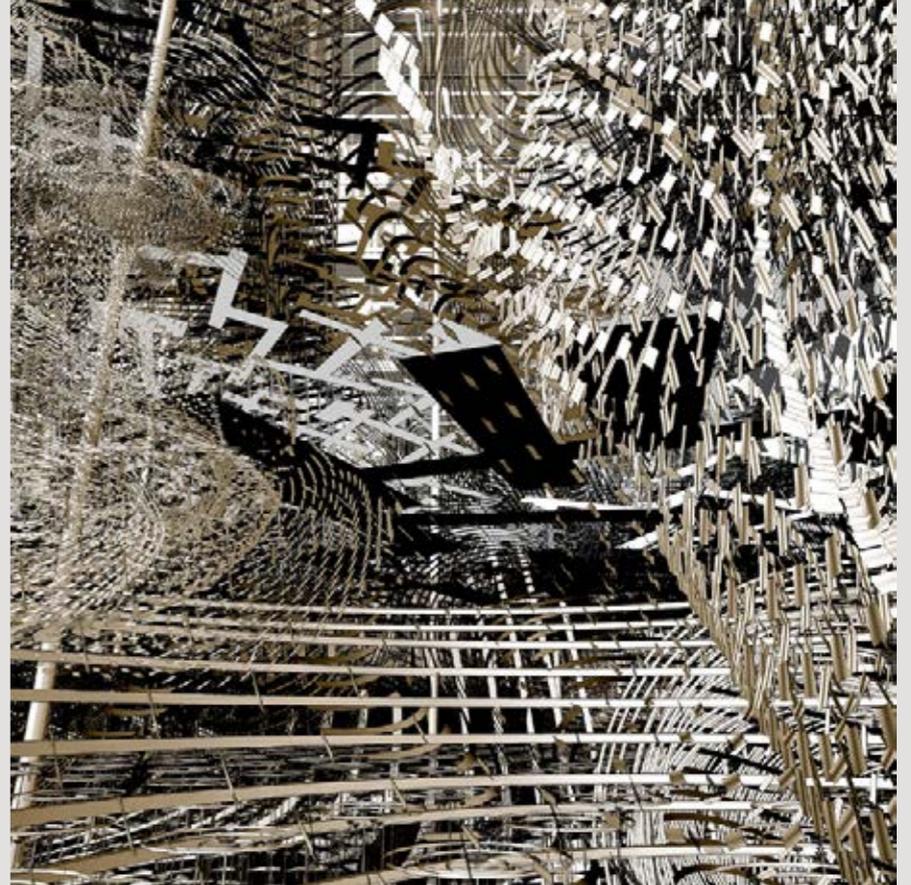
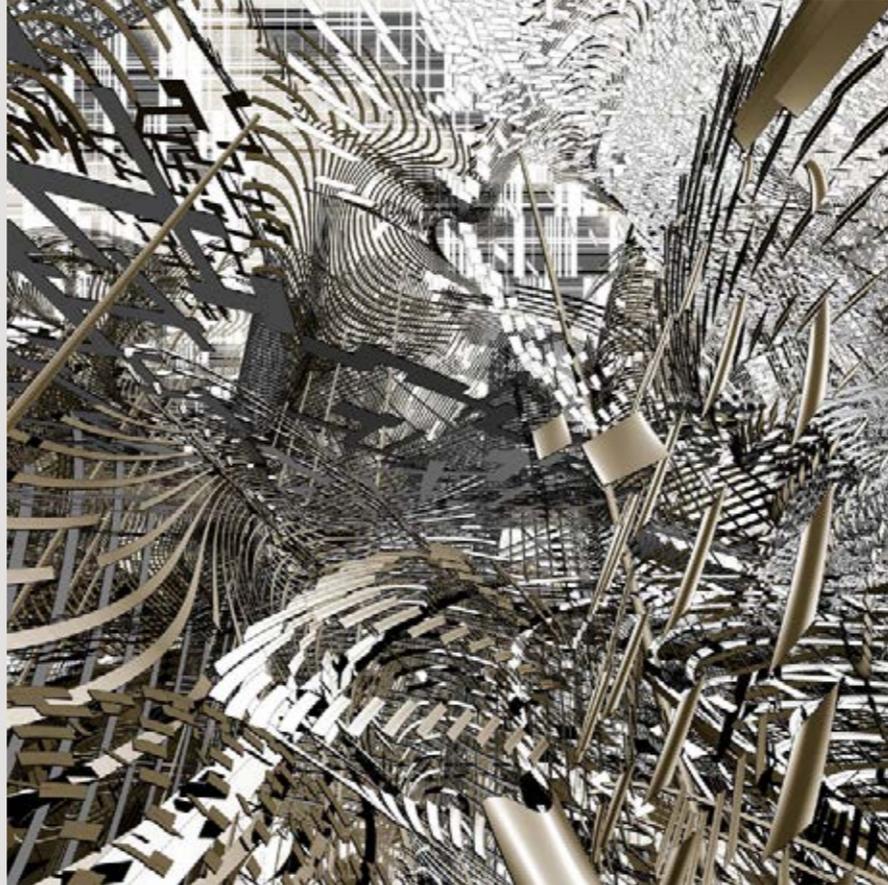
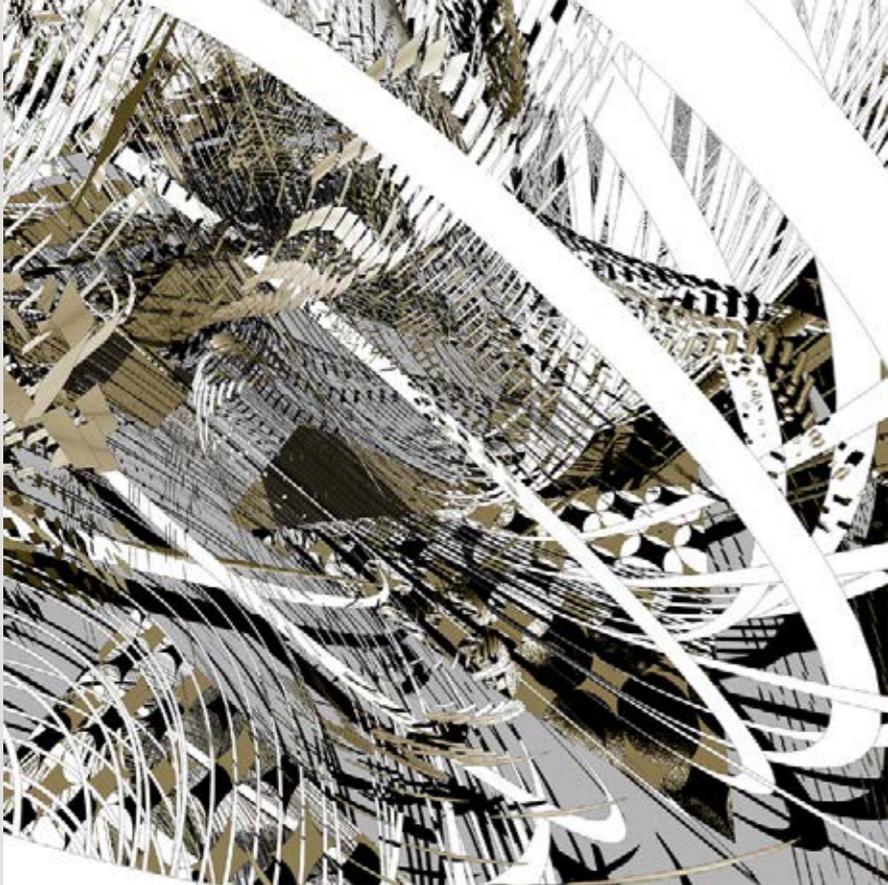
The Loncon exhibition also included nine specially developed display panels and a film that used a montage of various projects alongside rendered sequences of the Gold Mine with a voice-over from the authors - the film was devised and edited by the author.

The Gold Mine: Loncon 3, exhibition layout (2014)





The Gold Mine: Loncon 3, installation photographs (2014)



The Gold Mine: Virtual Labyrinth Views (2014), Digital Print

Research Outcomes & Dissemination

The Gold Mine projects consists of a wide range of architectural drawings and rendered images, a large architectural model an eight-minute animation and a number of texts and published articles. The Gold Mine project has been exhibited at six public exhibitions, featured in two publications and four public presentations

One of the principle objectives of the Gold Mine project was to disseminate the work beyond academia. The Gold Mine was exhibited at the 72nd World Science Fiction Convention (Worldcon) held at the Excel Centre, London between 14-18 August 2014. The Worldcon is the largest science fiction convention and is organised by the World Science Fiction Society (WSFS), it is where the prestigious Hugo Awards are presented. Loncon 3 was one of the most successful Worldcon's ever held selling the most memberships (10,833) and had the second largest in-person attendance (7,951) of any Worldcon to date.

While the exhibition was in production the two main concept drawings were exhibited at the Future Cities 3 conference in Greenwich and a book chapter was published as part of Architectural Design vol 232 'Future Details of Architecture'. The Gold Mine was also exhibited at an exhibition as part of 'Educating Architects' (Spiller Clear 2014) which featured internationally renowned architects / teachers who had contributed to the book.

In 2015 the Gold Mine model was submitted for selection at the Royal Academy Summer Exhibition, where three of the five sections of the model were selected to be exhibited adjacent to works by Zaha Hadid Associates and Landscape architects Gustafson and Porter. The RA summer show was attended by over 229,000 thousand people (RA 2015).

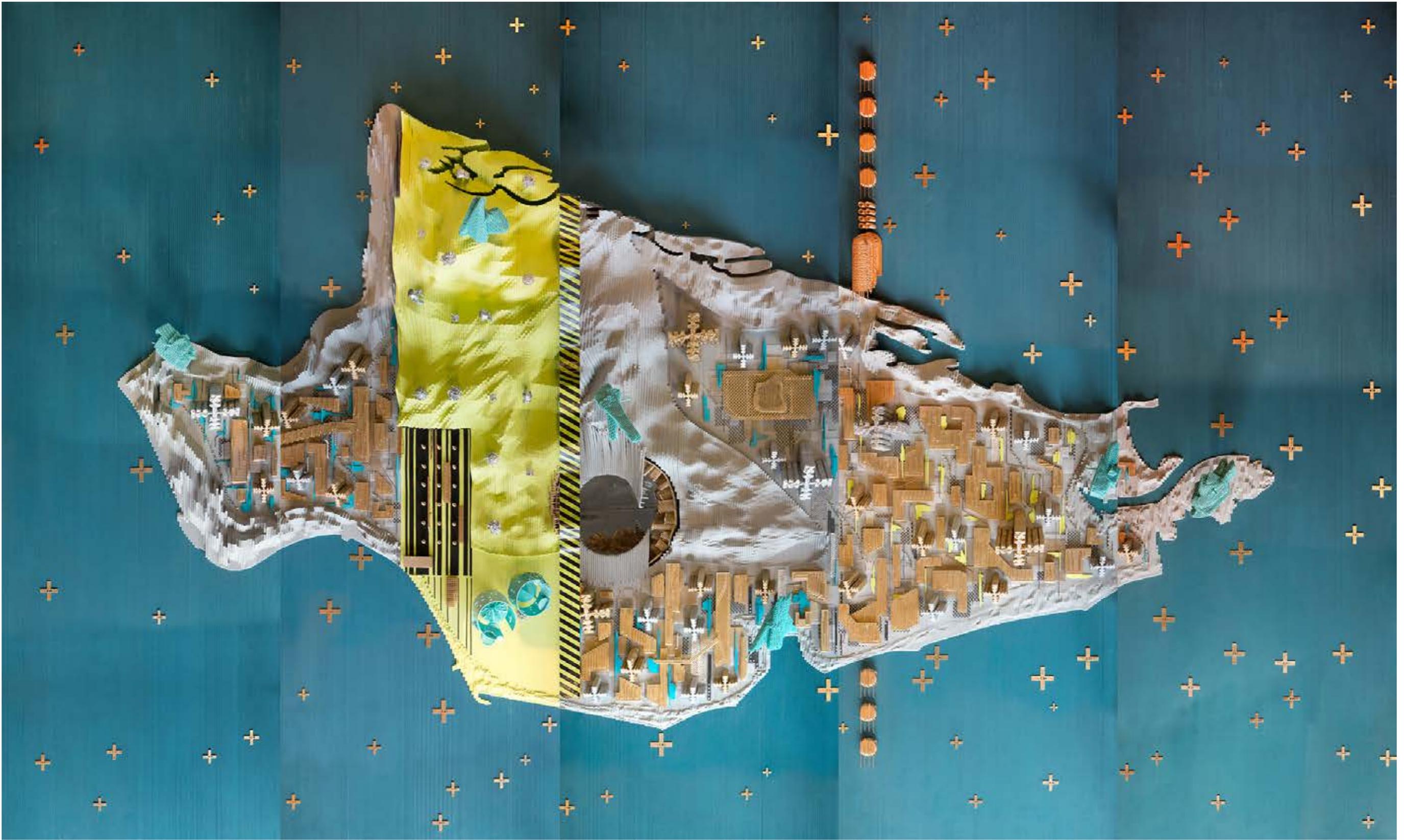
In 2019 the author was approached by Architecture curator Gonzalo Herrero Delicado to contribute to an International exhibition 'What is Radical Today? 40 positions on Architecture' to inaugurate the new architecture room at the Royal Academy. A modified image from the Gold Mine and an original text were exhibited under the title 'The Post-singularity City'.

Educating Architects: Stephen Lawrence Gallery.
Exterior view, showing Gold Mine installation

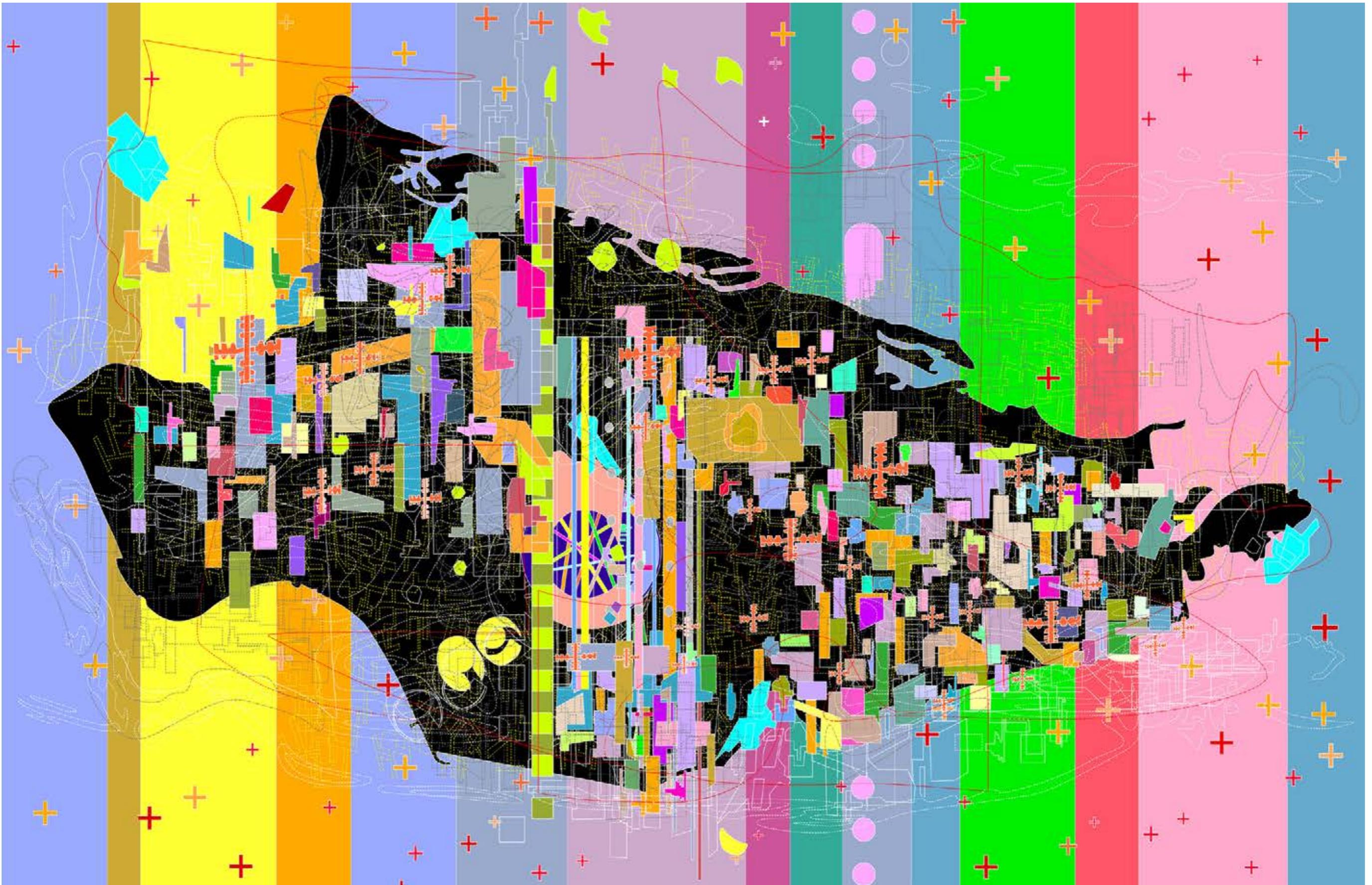




Educating Architects: Stephen Lawrence Gallery.
Interior view, showing Gold Mine model (2014)



The Gold Mine: Model (2014). Mixed Media
(Overleaf) *The Gold Mine: Intensities Plan*, (2015) Digital Print



Publications:	2014	<p>Clear, N. 'Future Cities 3: Abundance', Clear, N., Aling, M. (eds), University of Greenwich, ISBN 978-1909155060</p> <p>Clear, N. 'The Gold Mine: A Ludic Architecture', in Garcia, M. (ed), Architectural Design. No 230 'Future Details': Chichester: John Wiley and Sons. (pages 128-133).</p>
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Exhibitions:	2014	<p>(Group Show) 'Future Cities 3', Stephen Lawrence Gallery, ORNC, University of Greenwich. London. (April)</p> <p>(Solo Exhibition) 'The Gold Mine', Loncon 3, 72nd World Science Fiction Festival, Excel Centre, London. (August)</p> <p>(Group Show) 'Educating Architects' Stephen Lawrence Gallery / Project Space, University of Greenwich, Stockwell Street, London. (September – October)</p>
	2015	<p>(Group Show) Royal Academy Summer Show 2015, Royal Academy, London.</p> <p>'Greenwich at the RA', Stephen Lawrence Gallery, University of Greenwich, London.</p>
	2019	<p>(Group Show): 'What is Radical Today? 40 Positions on Architecture', Royal Academy, London. (6th September – 7th November)</p>

Talks / Presentations:	<p>Symposium Paper: 'The Gold Mine', 'Future Details of Architecture', University of Greenwich, London. (19th September 2014)</p> <p>Gallery Talk: Flexible Exhibit Space, Loncon 3, Excel Centre. (Friday 15th August 2014)</p> <p>Public Discussion: Speculative Design Panel: Capital Suite 16, Loncon 3, Excel Centre. (Sunday 17th August 2014)</p> <p>Conference Paper: 'The Gold Mine', Future Cities 3, University of Greenwich. (10th April 2014)</p>
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Selected Reviews:	<p>Buxton, P. (2015) 'Summer Solace', review of the architecture room at the 2015 RA Summers Show. RIBA Journal: RIBAJ 11 June 2015. https://www.ribaj.com/culture/ian-ritchie-ra-summer-show-2015</p> <p>The Gold Mine is featured in Spiller, N. (2017), 'Architecture and Surrealism A Blistering Romance'. Thames and Hudson: London (p186 to 193).</p>
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The Royal Academy Summer Show 2015. The Gold Mine model, Mixed Media.

Greenwich@RA: Stephen Lawrence Gallery, Gold Mine installation view (2015)



'What is Radical Today? 40 Positions on Architecture', Royal Academy London showing 'The Post-Singularity City' (2019). Digital Print + Text



Conclusion

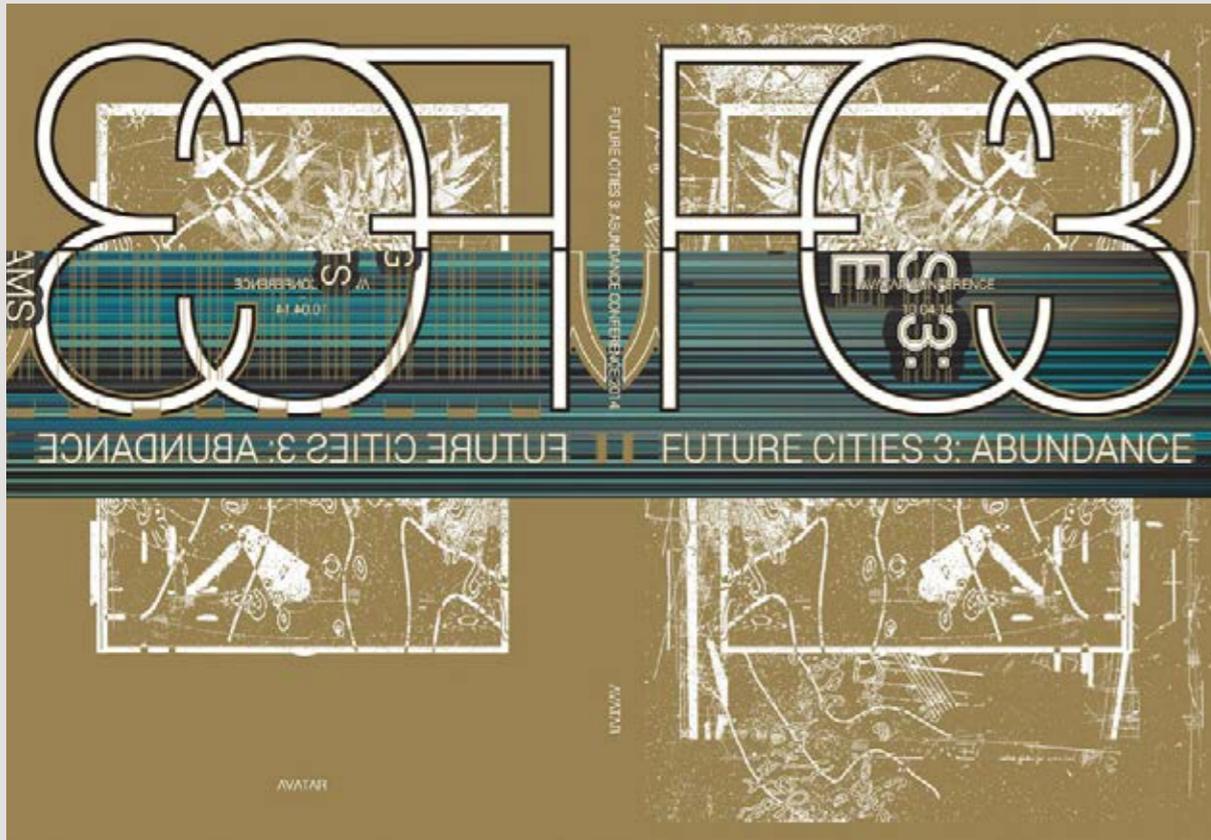
The Gold Mine is a physical manifestation the authors work on the concept of architecture 'as' science fiction (Clear 2014). The project integrated utopian precedents from architecture and science fiction alongside the Nano-Bio-Info-Cogno technologies to create a design for a post-scarcity post-singularity society based upon ludic principles, questioning the prevailing consensus within architecture that urban proposals should avoid the utopian ambitions of previous generations. In the development of the project the author used historical precedent alongside digital design and manufacture to create an exquisite large-scale model, an evocative suite of drawings, as well as animations and texts to communicate these ideas in an original manner accessible to a wide audience.

Pamela Buxton described the Gold Mine as a 'stunning mixed media landscape' (Buxton 2015). Harry Hill featured the Gold Mine on a BBC review demonstrating the popular appeal of the project by comparing it to the 'lair of a Bond villain' (Hill 2015). Time Out magazine used an image of the Gold Mine as one of the highlights of the RA Summer Show (Time Out 2015).

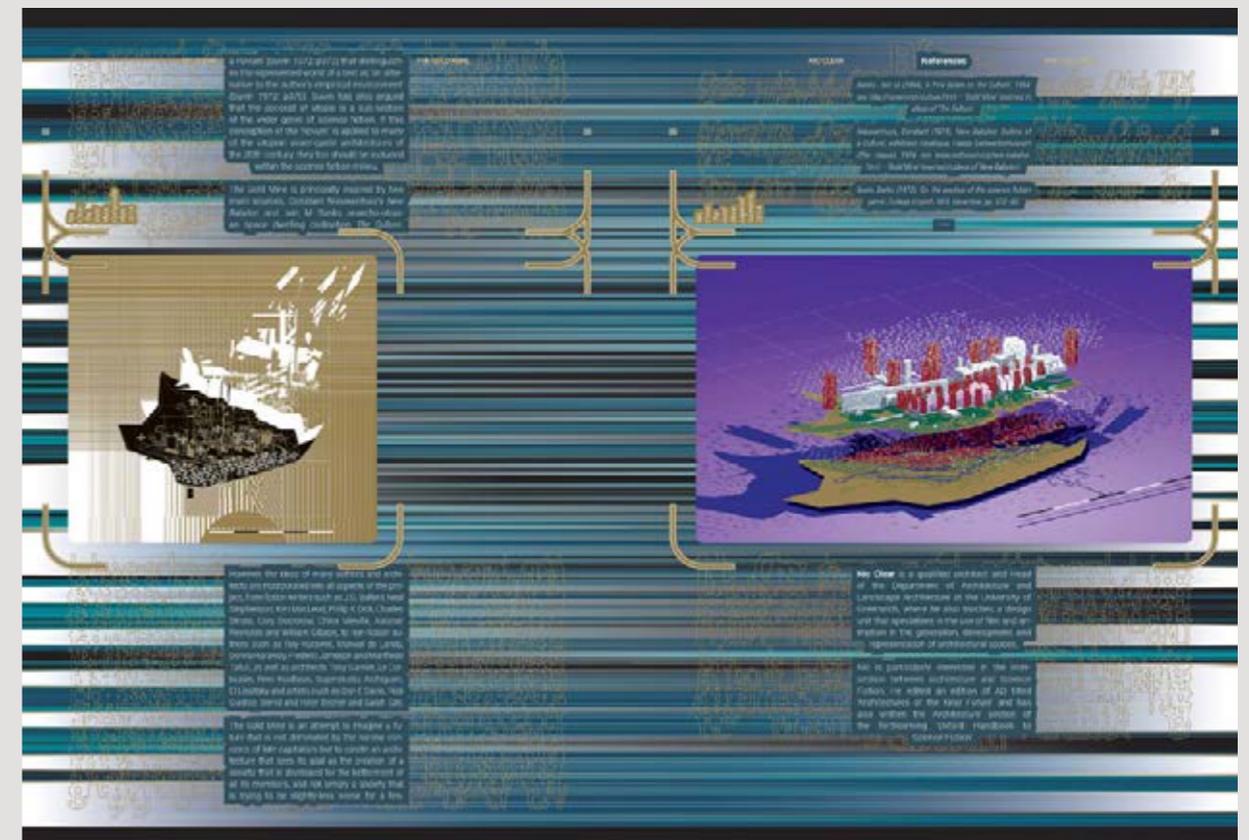
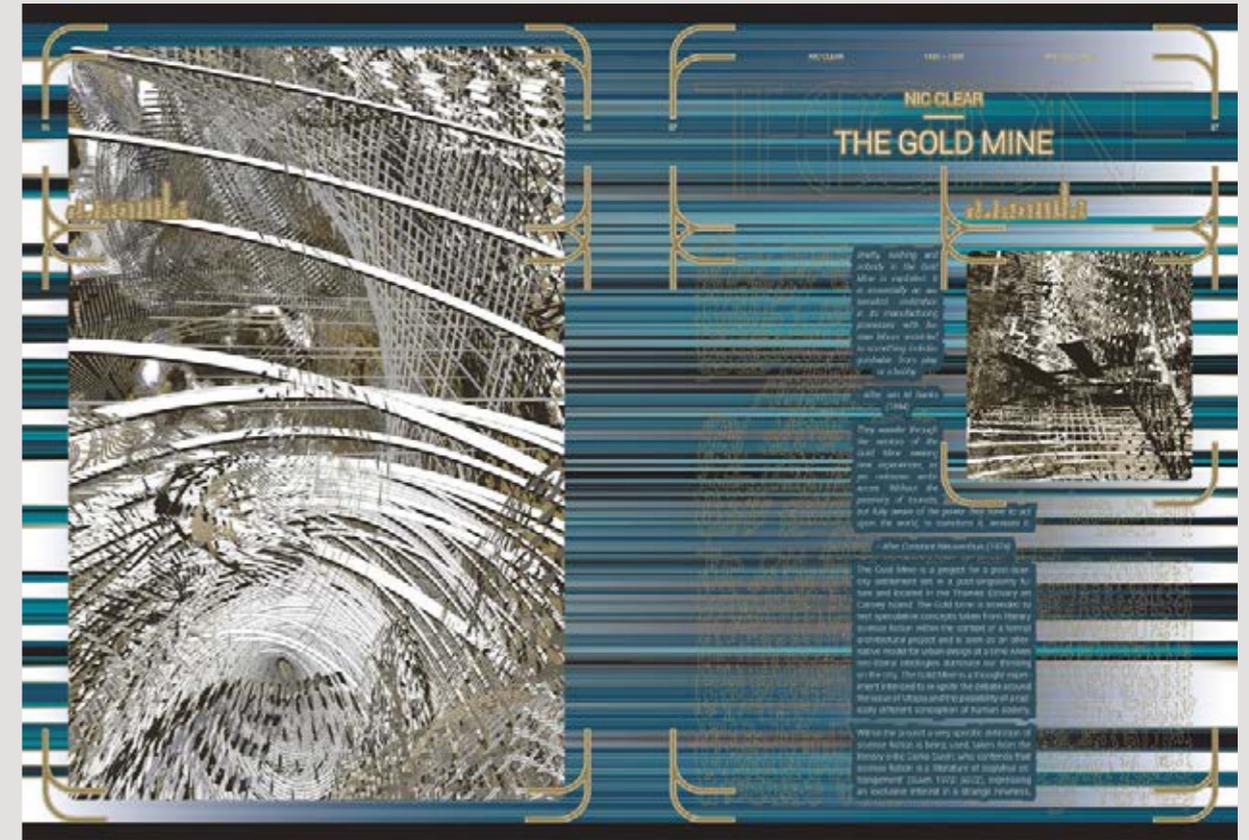
<https://www.timeout.com/london/art/royal-academy-summer-exhibition-our-top-10-works>.

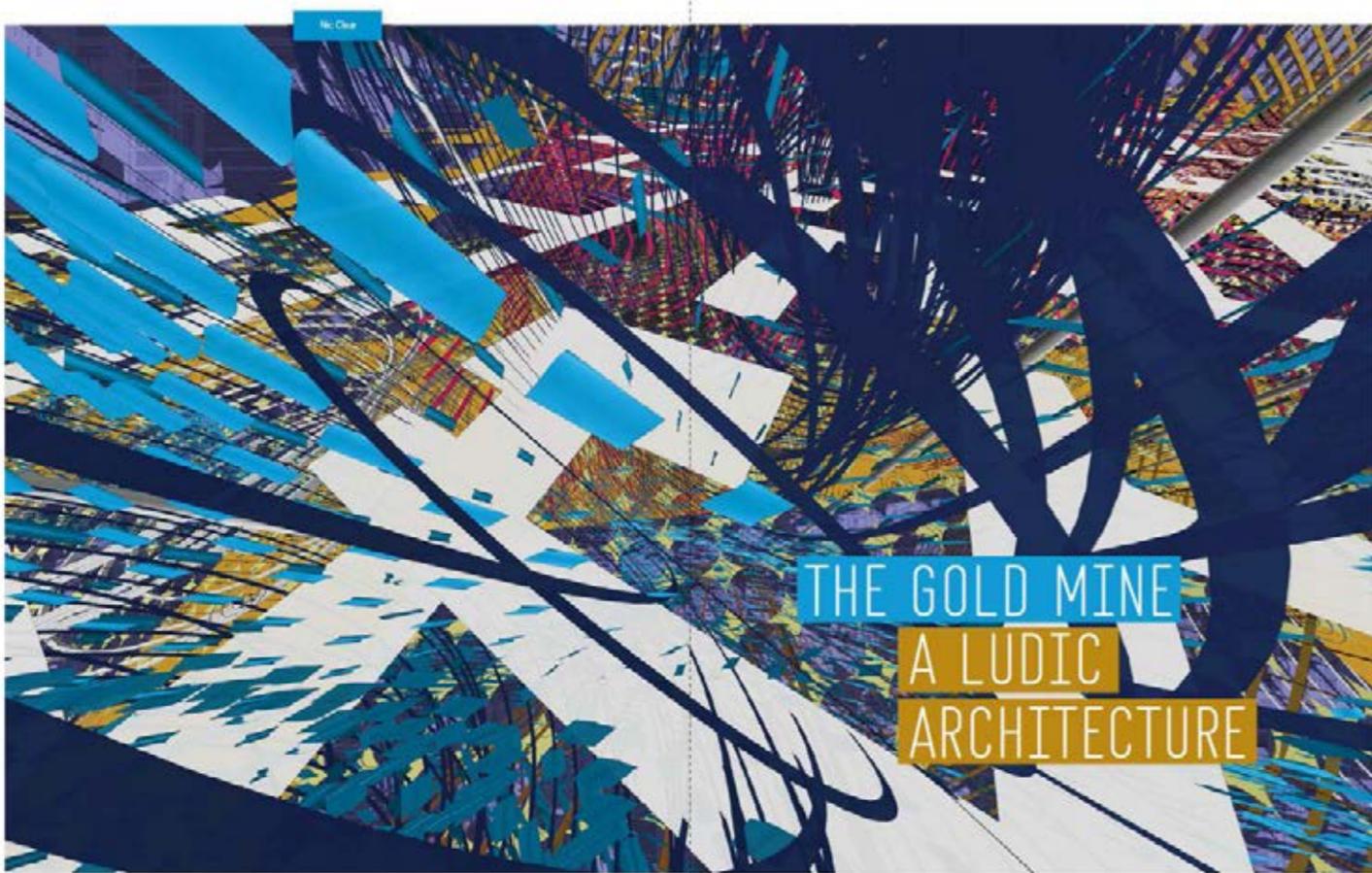
The Gold Mine features in Professor Neil Spiller's book 'Architecture and Surrealism' (Spiller 2016), where Spiller acknowledges that the project aims to 'provoke debate about the future of the city in the face advanced technologies'.

(Left) 'What is Radical Today? 40 Positions on Architecture', Royal Academy London featuring 'The Post-Singularity City' (2019). Digital + Text



'The Gold Mine', in Clear, N., Aling, M. (eds), 'Future Cities 3: Abundance', University of Greenwich





THE GOLD MINE A LUDIC ARCHITECTURE

Nic Clear, 'The Gold Mine', Great Southern Village Plan, 2014. The image shows the layout of the site and the location of the Gold Mine within the New Albian system.

As an educator and architect, Nic Clear is renowned for his passion for film and science fiction; he teaches a unit in film and animation at the University of Greenwich, London, where he is Head of the Department of Architecture and Landscape. Here, in a recent speculative project, the Gold Mine, he weaves together a science fiction-like narrative that is heightened by its attention to visual and narrative detail.



Briefly, nothing and nobody in the Gold Mine is exploited. It is essentially an automated civilization in its manufacturing processes with human labour restricted to something indistinguishable from play, or a hobby.

They wander through the sectors of the Gold Mine seeking new experiences, as yet unknown ambiances. Without the possibility of tourists, but fully aware of the power they have to act upon the world, to transform it, recreate it.

The Great Southern Village (GSV)
The Great Southern Village, or GSV, is a post-scarcity, post-urgency settlement that forms part of the New Albian system. While it is primarily an extension of the capital that stretches from the orbital in the west to the estuary mouth in the east, and is approximately 50 clicks long and 10 clicks wide, the GSV is an autonomous urban region with its own independent system of control and governance.

That nothing is clearly wasted is an aspect of the post-scarcity world that might sound counterintuitive. However, all material is always recycled; nothing is ever thrown away. Indeed, it is this technological ability to utilize every available piece of matter that actually creates a post-scarcity world. Everything can be broken down into its constituent elements so that they can then be recombined anew; sometimes this means reducing them right down to their atomic structures.

The megacities of New Albian are located on historic transport routes, with the areas between them designated as wilderness. Following on from James Lovelock's thesis that 'we should air condition the cities and let Gaia take care of the world', urban growth has been concentrated into clearly defined dynamic areas with the rest of the country allowed to return to an unattended state.

The Great Southern Village is named somewhat ironically as it was previously occupied by barbaric native tribes whose existence belies the pastoral image of the term 'village'.

The Gold Mine
The Gold Mine is a linear city seven clicks long that runs along the banks of the estuary, located 10 clicks from the eastern edge of the GSV. The area had been evacuated due to flooding in 2025, since it had been 3 metres (10 feet) below the level of the highest tide and even the extensive flood defences could not hold back the rising waters of global warming. The flooding ceased to be a concern once society reached its current phase of abundance and the area was chosen for resettlement, partly due to its location, partly due to the fact that there was still a surplus of materials left from following the floods, but mostly due to the mythic status it had acquired from its musical heritage.

The linear nature of the East-West axis is bisected at various points by built structures that break up the main structure and introduce more scenic elements.



By connecting the city with the landform parklands that separate the Gold Mine from the rest of the GSV and New Albian beyond, these structures generally follow parts of the terrain of the former island, though this is not seen to be particularly significant.

The Gold Mine has been fully operational for 20 years, and is in a continual state of evolution. Its population is around 3.8 million inhabitants, though this figure can fluctuate quite considerably due to seasonal variations and whatever events are scheduled for any given period. Even in its current state the Gold Mine could accommodate nearly 10 million inhabitants, however its under population is deliberate and serves as conducive to the 'work' that goes on there.

The Gold Mine itself is designated a creative leisure zone, where the inhabitants are engaged in developing speculative ideas and projects that may later be deployed across the whole of society. Its 'industries' are based around the concept of 'homo ludens', and for the inhabitants leisure and gaming activities are linked into processing and problem-solving issues set up by the AIs. The benefits of this are that inhabitants are encouraged to create and act out wild fantasy scenarios that are fully indulged and supported. Given that the whole of the post-scarcity world is run according to ludic principles, the Gold Mine is still considered incredibly hedonistic even by those standards.

There are two main work scenarios that inhabitants perform. The first is task based and might involve working through combinations of puzzle-based computational operations. The second is problem based and can often involve role playing or competitive gaming. Both are an evolution of an ancient approach to solving unsolvable problems; that is, to give them to a 'touch of wonder' without telling them they are unsolvable.¹

The structure of the city is itself a giant computer with every surface being part of a programmable substrate that embeds a whole array of functions from data storage to environmental control. The surface substrate also carries light, power and data throughout the entire system.

All substrates capture energy in a number of ways: photovoltaic, electromagnetic, chemical as well as kinetic. This captured energy is stored within another part of the substrate. One of the main features of the Gold Mine is that energy is essentially free due to the fact that the various systems operate in an incredibly efficient manner and very little energy is lost due to problems of storage and transmission. Its proximity to the tidal reach of the estuary means that tidal energy is harnessed, its south-facing facades maximize solar energy, and ground-source energy systems are utilized as bio-mass. But these are supplementary systems skin to solar-

'The Gold Mine is constantly being remodelled both by the AIs and by its human occupants – usually by a combination of both. No architects are involved; the AIs act as expert systems that organise the logistical and structural transformations, while inhabitants can 'sculpt' their own spaces using interactive interfaces.'



powered garden lighting; the main sources of energy are the hybrid fusion-fusion reactors that extend from the Gold Mine's shoreline out into the river estuary.

The fabric of the built structures is part of an intelligent system that uses smart matter¹¹ as its primary construction material. Smart matter is made up of billions of nanotechnology machines that can alter their configuration to develop almost any kind of object, and is largely used in combination with other more plentiful materials (dumb matter). One of the principal 'dumb' materials in the Gold Mine is salt (sodium chloride), which can be easily extracted from the river and used to build elaborate crystalline structures with the smart matter acting as a 'glue', fixing the material so that it is not affected by water that would otherwise dissolve it. Smart matter allows the environments of the Gold Mine to be constantly reorganised and remodelled – the whole city is in constant flux with only certain strategic elements remaining static.

The underlying structures of the Gold Mine are created from carbon nanotubes that are both incredibly light and immensely strong. The nanotubes are woven into high-tensile polymer structural nets by swarms of weaving bots. Indeed, these bots are responsible for the majority of the constant remodeling work that goes on. Individual enclosures and spaces are either created in-situ or prefabricated and then hung or

clipped onto the structural nets. Services can be rerouted in any direction throughout the system and do not need to rely on gravity, and the service conduits can pump material without the need for an external pump.

The overall profile of the Gold Mine is relatively modest with the majority of the built sections only 50 stories high, although some of the residential towers go up to 200 stories.

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long, healthy and productive lives; their natural systems are heavily augmented for both performance and cosmetic purposes, and every inhabitant of the Gold Mine is connected to its system by a series of neural and physiological implants, allowing them to augment their surroundings simply by thinking about them. Some of these changes are perceived by the individual alone, or by anyone who wishes to subscribe to the authors channel. The fact that the majority of inhabitants are highly experienced in the use of games and augmented-reality environments stops the type of psychosis that almost non-stop immersion in such an environment can entail.

To facilitate this level of immersion, nearly all citizens have artificial corneas implanted at birth that allow the eye to function as a screen with data overlays. Tactile differing scope registers, such as being across a greater range of the electromagnetic spectrum, are also possible.

The levels of augmentation extend beyond the body into the clothing that inhabitants wear and into the objects they use. Smart clothing is the norm; it is capable of adapting colour and texture and is part of a biometric feedback process that interfaces with the system. Children who grow up in the Gold Mine are guided by the system in

terms of their personal and educational development. As with the overall running of the city the goal of the system is to maximise the potential of every child and to develop skills and abilities in accordance with their desires. One aspect common to all children, indeed almost every inhabitant of the Gold Mine, is that they can speak at least 12 languages. A child's education is developed through a process of individual and collective games at an appropriate pace for the individual, and is constantly monitored to be both fun and stimulating. Children in the Gold Mine almost never get bored unless it is necessary for them to do so.

Crime is extremely rare in the Gold Mine for two principal reasons: firstly the majority of inhabitants are simply too well adjusted to commit uncontrolled deviant behaviour, and secondly the system has ways of accommodating and channeling any anti-social urges into productive outlets. For example, it has been found that psychopaths are very good at designing fractal pattern systems and are often employed to develop vivid textures for multisensory environments. For those inhabitants who simply cannot control their urges, these can be accommodated through virtual means; acting out depravity has been found to be an effective substitute and can even be utilized as part of the ludic impulse. Nothing is wasted, as

Notes
1. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
2. Constant Nouwenhoven, New Babylon: Culture of Culture, exhibition catalogue, Maastricht University, 1974, see <http://www.newalbian.com/newalbian.html>.
3. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
4. James Lovelock, 'Gaia: A New Look at Life on Earth', 1979, see <http://www.gaiacentre.com/gaia.html>.
5. The Gold Mine was the name of a Japanese magazine that ran from 1967 to 1970.
6. The current population of New Albian is 10.1 million.
7. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
8. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
9. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
10. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.
11. See M Banks, 'A Few Notes On The Culture', 1994, see <http://www.newalbian.com/culture>.

'The Gold Mine: A Ludic Architecture', in Garcia, M. (ed), Architectural Design. No 230 'Future Details': Chichester: John Wiley and Sons. (pages 128-133)

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Output Type:

Chapters in edited books, curation of exhibition, solo exhibitions, contribution to collaborative group exhibitions, architectural design