Prospectives

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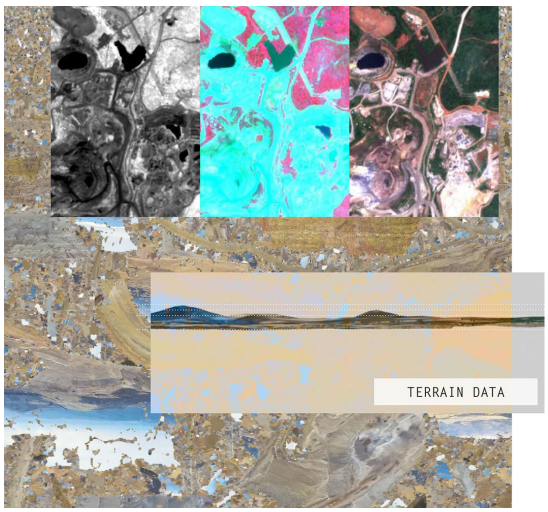

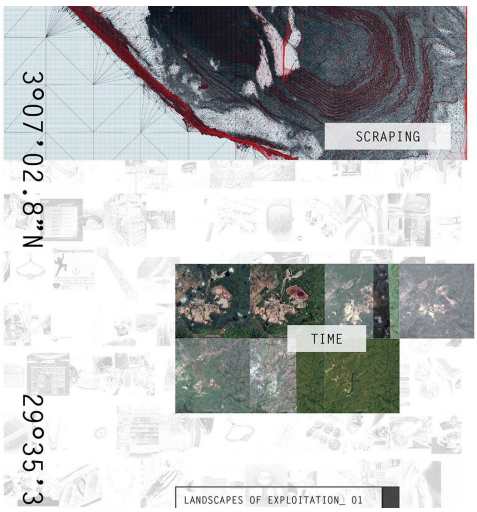

Figure 1 – Landscapes of Exploitation, Kibali gold mines, Democratic Republic of the Congo.

MIGRATING LANDSCAPES

Tanya Mangion, Michiel Helbig, Corneel Cannaerts

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SION, MEDIA ECOLOGIES,
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MEDIA ECOLOGIES

Our collective consciousness of climate change is an accomplishment of the vast apparatus of computational technologies for capturing, processing and visualising increasing amounts of data produced by earth observation technologies, satellite imaging, and remote sensing. These technologies establish novel ways of sensing and understanding our world, extending human visual cultures in scale, time and spectral capacities. The gathered data is synthesised in increasingly complex models and simulations that afford highly dynamic visualisations of climate events as they unfold and envision near future scenarios. The images resulting from this technical vision and cognition render the artificial abstraction comprehensible and are essential in developing the notion of climate change and attempts to mitigate its effects.[1]

The artificial abstraction introduced through this planetary apparatus is reflected in the naming of the Anthropocene, as the contemporary geological epoch, prompted by humanity's lasting impact on our planet.[2] The naming has been criticised for its anthropocentrism, i.e. putting the human once again at the centre, and for depoliticising and de-territorialising climate change, casting the whole of humanity as equally responsible for environmental crises, disregarding substantial regional and societal differences. Several alternatives have been formulated in critique of the term: *Capitalocene,*[3] highlighting the devastating role of capitalism in climate change, or *Plantationocene,*[4] stressing the ongoing inequalities resulting from colonialism and slave labour. While acknowledging these terms, Donna Haraway proposes the term *Chthulucene*, introducing multispecies stories and practices, mythologies, and tentacular narratives to avoid anthropocentrism and reductionism, providing room for more than human agency.[5]

The framing of climate crises within human-centred, depoliticised, technocratic discourse is also strongly critiqued from cultural practices in the arts, design and media.[6] The top-down, analytical point of view afforded through scientific observation, visualisation and prediction is increasingly being complemented by documentary, eyewitness and on-the-ground reports of the impact of climate change. Images captured through the plethora of cell phone and other cameras, data logging, image sharing and social media produce a constantly updating stream of images and data on climate change. Digital media ecologies, the assemblages of hardware, software and content of digital

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media within our environment, play an important role in addressing climate change.[7] Whether it is through the repurposing of the scientific apparatus and technologies for observation and visualisation or the ubiquitous use of personal devices and social media, computational images have become significant cultural media artefacts that can be used to develop more narrative and fictional imaginaries of environmental crises.

Landscapes are defined as both natural and human-made environments, as well as their depiction in media such as painting, photography and film. Even as environments, landscapes are a physical and multi-sensory medium in which cultural meanings and values are encoded. Landscapes operate through the visual; i.e. a landscape is what can be seen from a certain vantage point, and implies an active spectator. As a verb, landscaping indicates acting on the environment, through manipulating its material features, erasing or adding elements. Both as environment and as media, landscapes are inextricably entangled with capital and power, whether exploited through extracting resources, consumed as an experience through tourism and real estate, or mediated and commodified as an artefact. In *Landscape and Power*, Mitchell indicates a landscape as a medium; an area of land is only considered a landscape from the moment one perceives it to be as such, through attached meanings, as artificial-cultural, political and social constructs.[8] The recent climate crises and the emergence of digital media ecologies require us to rethink this implicit human-centred notion of landscape and extend it to include non-human, animal and machine agencies.[9] As such, landscapes are an interesting lens through which to look at the blurring between the natural and the cultural, human and non-human agency, and the mediated and bodily experiences of environments.

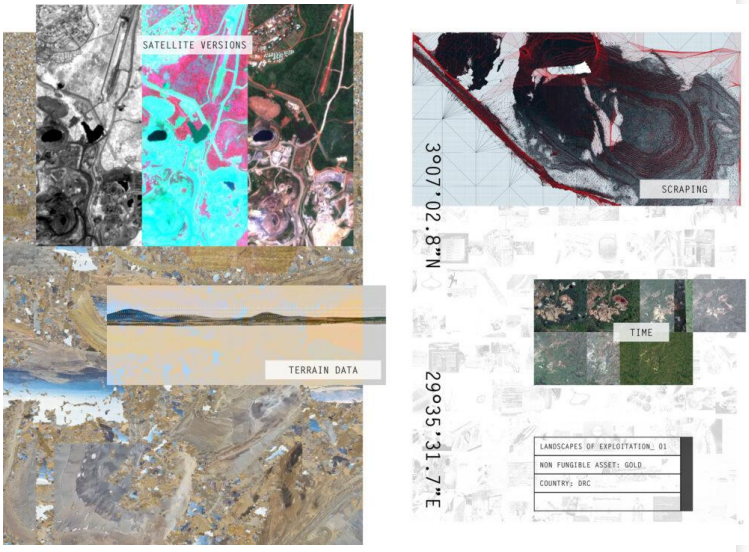

Figure 1 – Landscapes of Exploitation, Kibali gold mines, Democratic Republic of the Congo.

MIGRATING LANDSCAPES

The dissertation project “Migrating Landscapes” by Tanya

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Mangion is framed within the ideas outlined above, it explores landscapes as both environment and media, inextricably entangled with capital and power.[10] The project speculates on landscapes gaining agency through a decentralised autonomous organisation (DAO),[11] that can interact on behalf of the landscape with human agencies – individuals, governments, legal entities, financial systems… Once established, the DAO operates on the blockchain and can operate without human interference as regulated through smart contracts. Governance of the DAO is regulated through tokens, which fractionalise stewardship, but cannot act against the interest of the landscape as encoded by the DAO.

This speculative scenario questions what role architecture could play when engaged by a DAO that represents the interests of exploited landscapes. How do architects design for this non-human agency? What strategies could architects develop to engage landscapes beyond the habitual ways of looking at them as resources to be excavated, sites to be developed? What novel languages, tools and protocols would architects need to develop in order to take up this role? Rather than attempting to find definite answers to these questions, they instead form the drivers for developing a speculative design project.

The architectural toolbox seems ill-equipped to deal with the large timeframes and scales that migrating landscapes operate on. In order to begin to address these questions we might extend the architectural toolbox with technologies such as earth observation, satellite imagery, data mining, sensor arrays… The role of the architect could be to repurpose the high-tech apparatus and data from scientific observations of climate change, and turn them into speculative design narratives and imaginaries on migrating landscapes. Using media ecology and algorithmic vision the project highlights issues and landscapes that deserve attention, and launches a call to architects who wish to engage with it. Data collection from available data sets including time-based, satellite, terrain and eyewitness data could be used to rebuild a cohesive image of exploited landscapes, using narrative media combined with conventional architectural processes. Injecting the image of the landscapes back into media ecology would generate a feedback loop that would go on to bring about changes in human behaviour in regard to the landscape both as media and environment, the latter occurring over a longer time frame.

The speculative design project explores this potential through different aspects: starting with the use of algorithmic vision to analyse landscapes, then giving an overview of the various phases of the development of a DAO, exploring a tokenisation shift from a fungible to a non-fungible valuation of landscapes, representation of landscapes in media ecology and demonstrating how

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architecture could be used to engage an audience.

ALGORITHMIC VISION

Computational visual tools allow architects novel ways of understanding, mapping and visualising landscapes. The combination of multiple data sets provides a more densely mediated version of a landscape. Satellites can pick up the image of a landscape and, when combined with terrain data, mapping platforms provide a data-rich and layered representation of the landscape. While mapping services, like Google maps or GIS, are presented as neutral media, they are entangled with commercial, military and political interests, [12] not only in the technologies used for capturing data but also in its visualisation – as is demonstrated by the absence of data for certain territories, differences in resolution, or the deliberate blurring of specific sites.[13]

Satellite imagery is not limited to capturing bands of the spectrum visible to human eyes; by combining several bands they can provide insights into vegetation, elevation, refraction, moisture, temperature... The resulting multi-band images can be considered synthetic artificial artefacts as they are assembled by algorithms. They remain largely invisible to humans, and are reduced to mediating information and data flows, as they "do not represent an object, but rather are part of an operation".[14] Depending on the capturing sensor, information is sampled at discrete intervals, introducing resolution ranging from a hundred metres to fifteen centimetres. Depending on the number of satellites and their operation, the images have a certain refresh rate, giving us the ability to visit time progressions within the landscapes. These freeze-framed images of landscapes provide us with information or proof of interventions that occurred within the territory over time.[15]

Figure 2 – Satellite bands from Sentinel Application Platform (SNAP), B8, infrared, natural colour.

The landscapes in the project were the result of human-centric actions like resource extraction, as demonstrated at one of the largest gold mines in the Democratic Republic of the Congo. In addition to satellite images, a virtual field trip of sorts allowed a journey through the data-sphere of the landscapes concerned. This led to extraction performed on different levels; data extraction from photo-sharing platforms was used to investigate the image of the landscapes within the limitations of its geolocation. Another data extraction was performed to explore the fungible asset within the landscape, resulting in a plethora of data, exploring the appropriation of the asset within our culture. Through a process of data scraping, deduction and fragmentation, a

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series of reconstructions of landscapes were produced during the project. These reconstructed landscapes link material flows from extraction to consumption – of, for instance, gold – and are published again through social media in an attempt to reveal the material sources of familiar consumer objects.[16] Gold was a remarkable mineral to start off with due to its use as a federal resource, keeping economies stable by functioning as a hedge against inflation, as well as its significance in history and popular culture.[17]

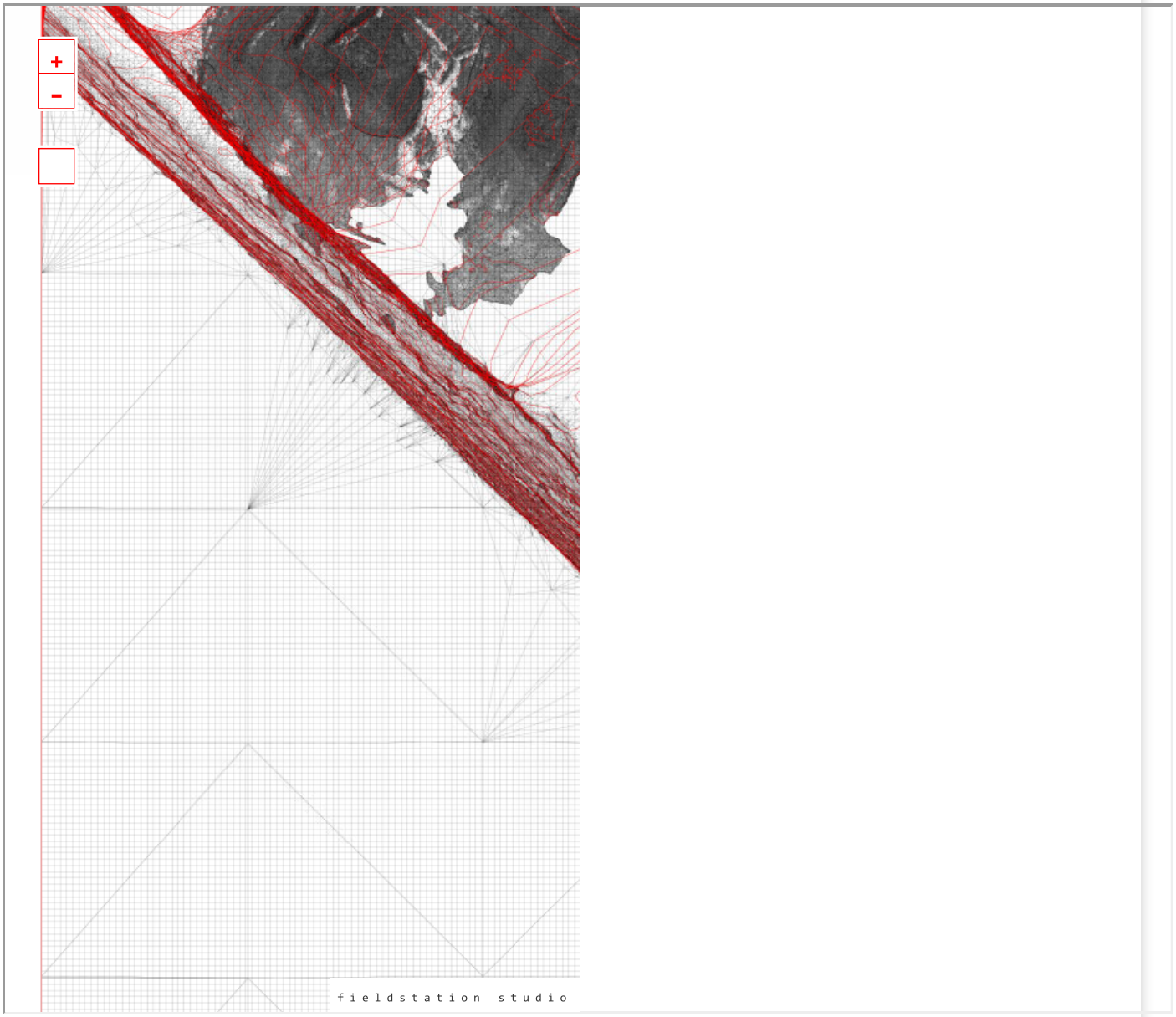

Figure 3 – Zoomable map of the Kibali gold mines, Democratic Republic of the Congo (press space to change layers).

TOKENISATION

When excavating landscapes for minerals, they are valued for their interchangeable or fungible material properties, for example the amount of gold they contain. Once extracted, each gram of gold is valued the same, regardless of where on

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the planet it has been mined. Whereas if one goes for a hike, for instance, or looks at landscape painting or photography, specific features of the landscapes, slopes or mountain peaks provide unique experiences; i.e., they are not interchangeable, they are *non-fungible*. In both these scenarios, the fungible exploitation of landscapes for resource extraction and the non-fungible experience of landscapes, mediated or otherwise, the landscape is passive and does not have agency.

Figure 4 – Tokenisation of the landscape though mesh triangulation.

The project proposes tokenisation of the non-fungible aspects of the landscape, controlled by a DAO, allowing collective stewardship of the landscape. This is to be achieved through appropriating tools from earth observation to build a mesh representation of the landscape. Each triangle of the mesh represents a unique, non-fungible fractional token of the landscape – in contrast to a *voxel* representation, which could be seen as representing the fungible exploitation of the landscape. This data allows an understanding, on a large scale, of fluxes within the landscape, and detects changes unseen to the human eye. Additionally, this data also offers the possibility to autonomise landscapes as DAO systems and thereby give them agency. The DAO operates transparently & independently of human intervention, including that of its creators. Based on a collection of smart contracts running on blockchain technology, it has the ability to garner capital, with automation at its centre and humans at the edges to manage, protect and promote its agency.[18]

Figure 5 – Voxelisation and triangulation representing fungible and non-fungible discretisation of the landscape.

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REPRESENTATION

There is a role for architects here, to become engaged to map and visualise the DAO's non-fungible entities. The architect has the tools to change the representation of landscapes, raising awareness of environmental evolution, generating behavioural changes and, over a longer timescale, impacting the environment itself. However, representation alone is not enough to communicate the sheer scale of these landscapes; the project proposes to map the exploited landscapes on the scale of urban environments, and build interventions in the form of pavilions to raise awareness of the landscapes. This serves to communicate the scale of material displacement of exploited landscapes such as mines within urban environments; commonly being the final destination for material flows, creating conversation and the possibility of engagement between the DAO and the human, with the latter generally being distanced from the reality of material displacement. This act brings the idea of tokenised landscapes to large audiences and allows for human engagement and participation within the DAO as shareholders.

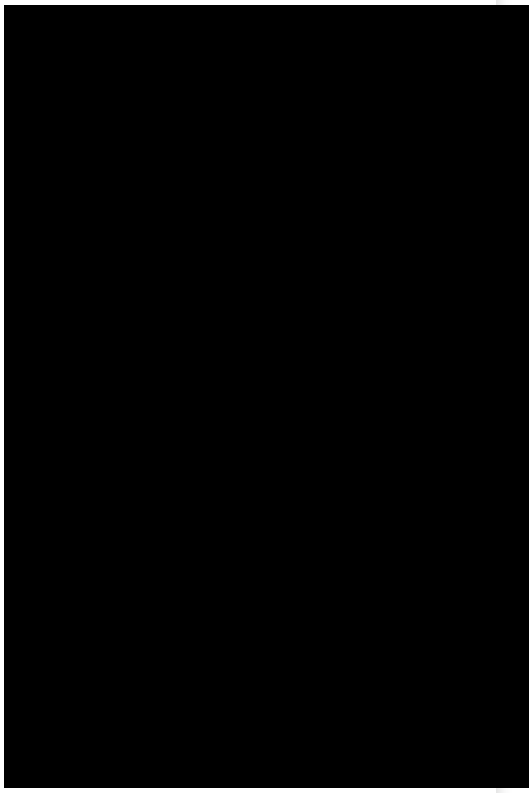

Figure 6 – 1:1 Visual representation of a physical intervention of part of the Kibali Gold mines within the urban environment of Ghent, Belgium.

The role of the architect engaged by the DAO is to map and visualise the landscape's assets, fractionalising it using algorithmic visual tools, and using architectural representations that can be minted as non-fungible tokens. The presence of these tokens on social media and through interventions within physical public spaces in cities aims, in the short term, to raise awareness of the vast scale of these landscapes of exploitation, and to change behaviours and allow for engagement and participation within the DAO as

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token holders. In the long term, this will start to affect the physical conditions of these landscapes themselves, as they no longer rely on selling their fungible, non-renewable material assets. This could lead to rewilding and restoring of vegetation – and potentially to their being traded as carbon sinks.[19]

Although token holders should be preserving the non-fungibility of the landscapes, returning to the argument that nature is ultimately defeated by its utility, the next step would be to remove the human from the system completely, merging the biosphere and technosphere. There is still a chance of a "51% attack"; meaning shareholders could agree to overturn an agreement within the smart contract. To prevent this, the system could opt for full autonomy, which it could achieve over a longer timescale. Garnering capital through non-fungible tokens – of its image – could also be a possibility, and would potentially affect and accelerate the timescale of the process.

Figure 7 – Leveraging social media to share images of the tokenised landscape.

DISCUSSION

Migrating Landscapes can be viewed as a concept that traces material flows through the use of algorithmic technologies not typically used within architecture, to explore how landscapes, non-human agents, can become autonomous. In the case of this dissertation project, the framework of a DAO was used to transform landscapes as media into non-fungible tokens, allowing the landscapes to stop being exploited and gain agency. What other technologies or tools could architects use to create compelling visual narratives, to engage with audiences and enable autonomy to non-human agents? Within the context of media ecology and algorithmic vision this was one response; considering the plethora of devices and data-gathering techniques that already exist and are still being created, the likelihood of autonomy for non-humans is ever more likely.

The project does not propose a techno-solutionist approach, where we can engineer ourselves out of wicked problems caused by climate change. Rather, it proposes to use these technologies for their compelling visual, imaginary and

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narrative qualities, to make migrating landscapes and their non-human agency more relatable. The DAO as a system ultimately acts as a driving force for landscapes to "migrate", becoming new entities and modifying our relationships and attitudes towards them. The system is allowing for these otherwise unseen landscapes to both establish presence within our media ecologies and to become located within our consciousness in this contemporary age. The changes it would instil are yet to be discovered.

Acknowledgement

This paper reflects on the dissertation project "Migrating Landscapes" by Tanya Mangion that was developed in response to the studio brief "Algorithmic Vision: Architecture and Media Ecologies" of Fieldstation Studio at KU Leuven Faculty of Architecture. The project speculates on landscapes gaining agency through a decentralised autonomous organisation that can interact on behalf of the landscape with human agencies. Through reappropriating technologies for algorithmic vision, landscapes could turn their unique features into non-fungible tokens, allowing them to stop being exploited and gain agency.

Fieldstationstudio.org |
https://www.instagram.com/migrating.landscapes/

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[17] In Extraction Models and along with Weronika Gajda the exploration of gold as a resource was explored further within the context of New York City's federal reserve, see https://www.instagram.com/extraction.models.

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