

The Vortex & Meshtectonics

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Vortex is a game that empowers you to change how you are identified by networks.

Abstract

The 'Internet' does not exist. Originally conceived as a shared collective experience of 'inter-networks', today it is a mass of overlapping filter bubbles. These bubbles curate us into data-objects to be consumed and purchased by advertisers. Browsing is determined by your consumer profile. Media-mining companies exploit invasive technologies such as IP tracking, geo-locating and cookies to create specific advertisements targeted to individuals. What you see, hear and the feeds you receive are gathered from your friends list, emails, online purchases, etc. Content presented to you is neither freely chosen nor objectively shown.

Vortex is a data management game that allows players to swap cookies, change IPs and disguise their locations. Through play, individuals experience how their browser changes in real time when different cookies are equipped. Vortex is a proof of concept that illustrates how network collisions in gameplay expose contours of a network determined by consumer behavior.

Keywords

Networks, HTTP cookies, Online Identities, Online Privacy, Media Traces, Data as Material, Internet, Digital Ontology, Social Awareness

1. Impetus

I was nine when got online for the first time. The Internet really reached general populace round about '95-98, that was when the whole 'Internet Democracy' movement started - that first wave of Use.net directory participants, the creation of mailing lists such as Net-time and Rhizome, subsequent artist groups such as Cobra, The Thing BBS, eToy and Hell.com These groups were of a different ilk, not the initial creators of DARPA/CERN who founded The Wells and

Arpanet, but rather ordinary non-technical citizens who were curious about this new technology.

It was this during this period that people talked of digital revolution: the internet would bring about new forms of democracy, we could live in virtual worlds and leave our bodies in 'meatspace', we could imagine alternate universes and dream in speeds of accelerated light. Debates centred around what it meant to be human, what was a cyborg, where did the public sphere begin and stop... these discussions raged across society, with names like Latour, Haraway, Deleuze, Foucault, Levy, McLuhan. I was not part of these concerns, blissfully ignorant and cocooned in childhood. When the Napster trial came, I did not realise what the implications meant - my interest was whether my downloads would finish in time, and how annoying it all was if I had to shift my accounts to Limewire.

What I want to be clear however, is that this was the internet I grew up with. While I was not an active participant in the questions of that time, it resonated through my life in curious ways and formed my view of what the internet was and should be. A memory, aged nine: I wanted to do a science experiment I saw on this website for growing bismuth crystals but I didn't know how to get it. I dug around the site's guestbook for the owner's contact, and sent him an email..... 3 days later a FedEx box arrived my place with the chemicals wrapped in t-shirts. A gift from a stranger in San Francisco.

But to think! A stranger! San Francisco! I had no idea what San Francisco even was! A box that came when I wished for it! It was magic! Magic beyond fairies and angels and wishing and hoping because it was *real*, and could affect reality. This barest conception of a future, of freedom, of *possibility*. I didn't understand it, but I could recognise it. It was this internet: of infinite possibilities, of dreams and failed utopias, of a digital revolution that hoped to come, of meatspace and wetware and hauntology that I grew up with. It was living *potential*.

2. Introduction

In the early days, the internet operated like a wild west - expansive and immense, scattered

pinpricks of habitation; little glimmers scattered across. There was no Google, or Facebook or Apple store to dominate and slice up real estate into clouds only a wilderness waiting to be explored. This chapter focuses primarily on the early artistic and creative explorations of how we communicate and express ourselves online. The advent of the internet has reshaped much of how we live, learn and communicate with each other through enabling new ways of interaction such as internet forums and social networking or accelerating the speed of delivery through search engines and instant messaging. Most importantly, this network of networks has allowed for an unprecedented amount of content generated: Youtube videos, Tumblr images, blogs of all genre, collaborative writing, open software, status-updates etc. ... all of which, could not exist several decades ago.

Such a huge socio-technological change led to the rise of groups such as Net.Art and international Fluxus in the mid 90's led by pioneers such as Jodi and Nam June Paik. These groups were all united by the common medium of internet-based artwork, even if the themes explored varied from artist to artist. Artists exploited new technologies by creating flash-based browser experiences, exploratory websites with no meaning or 'spam' ASCII artwork which could only be understood by viewing the source code. They took their discussions to mailing lists and chat-logs, emphasizing the free and open-sourced nature of the internet compared to traditional journal publishing. In those lists, they questioned and challenged the myth of internet democracy and explored new ways of shared public space.

Through their 'codeworks'¹, net. artists revealed how the 'natural' environment of the internets with associated myths of freedom and democracy to be highly constructed, and even controlled by corporations under the guise of 'user-friendliness' and 'interactive design'. Artists such as Lialiana, Aronson and Jodi experimented with layered applets, crashing screens and new capitalist structures which gave birth to the term 'browser art'. These experiments were noted by academia, with new media theorists such as Lovink, Galloway, Latour, Haraway, Lanier, Bauwens and Wark critically analyzing these new forms of subversion emerging from the internet. These

gestures towards a more artistic code were examined under Cubitt's seminal text, *Digital Aesthetics*² where he identified links between hypertext, emergent spaces as ideological playgrounds and spatial effects while speculating the possibilities of becoming within cyberspace. As the field of new media theory and new media art began to take shape, areas traditionally ignored by philosophy, architecture and sociology were examined leading to new convergences such as gamer theory, cyberfan culture, architectonics and P2P economies.

While Net.Art died at the burst of the dot.com bubble, from its ashes rose the new Web 2.0. Original Net.art projects such as Netomat and Hell(dot)com were later developed commercially to become products or sold as digital artifacts was absorbed by the very corporations it tried to resist.. Their experiments in software and user-participation helped push the new ideas of human-computer interaction (HCI) design and their practice collaborative work helped open conventionally separate fields of art and technology to push a more transdisciplinary mode of work. it inspired other movements such as hacker culture, makers/physical computing

Such is the climate of today's internet culture, where free creative output is taken in and subsumed to be re-packaged and sold as a consumer product. Terms such as "participatory culture" and "internet democracy" have been replaced with "crowdsourcing" and "platform politics", where the public mass is taken and understood to be a labor re-'source' for companies to create profit from. Corporations have done so by moving away from traditional paid, content-based models into platform lock-in where users are free to upload their content but are bound by the platform's Terms of Service. These terms of service usually give the platform-corporation the right to use, analyze and sell personal data and uploaded content to other service providers or marketing agencies resulting in a loss of individual autonomy and privacy.

To illustrate the scale of control: Facebook has over 1 billion users, with 138.9 million monthly unique U.S. visitors constituting at least 40% of United States³. Not only is Facebook populous,

¹ Alan Sondheim

² Cubitt, Sean (1998)

³ Alexa on Facebook, 2011

but it also produces enough content and data ranging from personal photos to status updates to notes and events to rival any major country's population. However, unlike a country it is not bound by any democratic process nor government duty. Rather it is a corporation whose sole goal is to generate profit to various shareholders and board members.

These platforms have therefore realized the dystopian dream of Deleuze's Society of Control⁴, where the politics of distribution have usurped the panopticon. The digital cloud has held users captive, through account logins, scraping email addresses off existing messages and website referrals. This systematic closing of spaces has changed the internet - no longer is it a singular network of networks but rather a networks nesting in other networks – fragmented and disparate, with each user experiencing a different form of the internet based on search engine keywords, selective filtering and advertising-pigeonholing. This is a control society of logins, accounts and unit matrices, and thus the ability to browse freely and escape from this military-corporate industrial complex becomes more and more urgent.

And yet despite the changes, contemporary media theory has not yet developed a methodology to model emergent practices, behaviors and conditions of a new digital world. Current media theory does not account for the dynamic nature of data and information flows, nor the changes in perception of time and dimensionality. With this in mind, I started thinking about creating a new language of symbols – new images that can be used to understand the nature of digital life and think critically about it.

Therefore, I propose a new framework of practice: *meshtectonics* – from 'mesh': how networks behave, scale and shape, and 'tectonic': the collisions of undefined dynamic plates to produce boundaries. It is through these collisions on the network that event boundaries are formed. Therefore to perceive terrain contours of a network, one must trace these collisions backwards, where they originate, how they form and what do they produce in order to analyze networks. This offers a decisive break from cartographic or 'mapping' metaphors, which conflate visual representations of known

static fields and cannot account for a key attribute of networks: emerging real-time data captured live. Meshtectonics asks the fundamental question: where does a network start and stop? What happens when one type of network collides against another?

3. Meshtectonics

Imagine: a comet speeding across the galaxies of inter-networks, with a streaming tail of data as it crosses dimensional planes and pathways; gaining momentum with every scrap of data and byte of stardust as it burns and collides with smaller meteors and tiny asteroids, bumping orbits with moons and smashing comets and finally burning out in a blaze of stardust - until all that is left is the traces of collisions: pockmarks on planets, gas trails, radiation gamma rays spanning, dirty ice across worlds. Even the most imperceptible movement, looks like a star from the right angle, the right scale and enough close-ups.

Collisions then, are form of detection. A collision is a meeting of two forces, or two 'faces' - profiles, identities, materials, selves - anything that causes an impact, an event to occur. These areas are subduction zones when two networks collide, either in conflict or to converge. Such events leave traces which can later be analyzed. It is through these traces that the boundaries of the network are seen, felt and sensed.

It is through these collisions that cultural artifacts are produced. They can be on a personal scale – the collaboration between a painter's hand, the acrylics and the yielding of a canvas; or on a vast digital scale where layers of protocols nested in each other; the movement from one domain (.com) to another (.edu); our multiple accounts and identities from the playlists and mash-ups uploaded to YouTube, the photos reblogged on Tumblr, the consumer products we chose and pin on Pinterest, our 2nd hand clothes displayed on Etsy... etc. these are gradients of associations that fade into each other, highlighted by violent intensity. Signals come in, noise fades out. I am flying in this sea of data that is countless as stars, pixel-bright and brilliant like sands falling through my fingertips; dazzling arrays.

We cannot map data because we cannot map ourselves. To assume that we somehow can

⁴ Gilles Deleuze, "Postscript on the Societies of Control"

map, can pinpoint and turn ourselves into dispassionate gods in the birds' eye view of all networks is extreme fallacy. We are neither the cold lens of a surveillance camera nor the diktat of an urban planner who can only see in lines, axis and geometry. No, we are greater than that. We are not merely data-capture, nor data-made - we are our own networks, and in our coming together - we create mesh-networks.

Meshtectonics then, is a kind of analysis in social relations. *Tectonics* then, is a way to think of how we might convey a sense of these relations. Tectonics suggests a planetary scale, of largeness that is difficult to comprehend. We know the earth rotates on its axis each day, we know so from the change of day to night but we don't feel the rumble under our feet nor the topsy-turvy of being tossed about like a washing machine. Much like the earth's rotation, we cannot feel the changes in the networks so large and numerous they are. Only hints of it, a ripple here; a fading there that clues us in that we are dealing with something far more layered and deeper than we are. Most of all, we can think of tectonics in several layers: one, that we are our own 'plateaus' or islands adrift; two, that our plateaus or nodes are situated on an even larger plate-tectonic that we can imagine; and finally: that tectonics can *move*.

Movement is important. Movement, as Deleuze once said in *Desert Islands*⁵ - is an act of creation. In the image he used: the island is created by two movements, the first movement was the dreaming of an island; the continental drifts and cleave; and the second is the one that brings the humans on to the island itself; a secondary production that is associated with the former but distinctly separate. Each movement is on its own-ness, radical and absolute:

"Dreaming of islands—whether with joy or in fear, it doesn't matter—is dreaming of pulling away, of being already separate, far from any continent, of being lost and alone—or it is dreaming of starting from scratch, recreating, beginning anew"
(Desert Islands, Deleuze)

In similar fashion, we meander along the tides of the web; connecting and disconnecting at will. In the world of networked time, there is no pace to

be measured by, no guilt or anxiety caused by the industrial *chronos* which yearns to put our relations into yardsticks and measurable goods. The very mutability, on surface, seems to be a kind of chaos, disorganized to extreme where an individual can create as many user accounts, identities, selves etc. as they wish to create. The many ways can the network be played, is the same as how many ways a person can generate perceptions.

This multiplicity of profiles manifests itself with every additional tab we open, every second chat window - we are not just connected, but interconnected and it is 'inter-ness; that restless movement, those hovering ghost-profiles, that lingering nameless wants, that aimless play - that helps us ride the current of our everyday lives. We leave traces, not traces to a specific 'identity' but rather traces to the configuration or dimension we operate in. These traces can come in many forms, from the unseen HTTP header files that start our cookie sessions to produced 'published' objects like fan-fiction and mash-up music.

3. The Vortex

Conception

The current state of today's internet is no longer the same as the one I grew up with. Media-mining exploits invasive technologies such as IP tracking, geo-locating and cookies to create specific advertisements targeted to individuals. Browsing is now determined by your consumer profile - what you see, hear and the feeds you receive are tailored from your friends' lists, emails, online purchases etc. The 'Internet' does not exist. Instead, it is many overlapping filter bubbles which selectively curate us into data objects to be consumed and purchased by advertisers.

This information, though anonymous, is built up over time and used to track and trace an individual's history - sometimes spanning an entire lifetime. Who you are, and your real name is irrelevant in the overall scale of collected data,, depersonalizing and dehumanizing you into nothing but a list of numbers on a spreadsheet. The superstore, Target, provides a useful case study for data profiling in its use of statisticians on their marketing teams. In 2002, Target realized that when a couple is expecting

⁵ 2005

a child, the way they shop and purchase products changes. But they needed a tool to be able to see and take advantage of the pattern. As such, they asked mathematicians to come up with algorithms to identify behavioral patterns that would indicate a newly expectant mother and push direct marketing materials their way. In a public relations fiasco, Target had sent maternity and infant care advertisements to a household, inadvertently revealing that their teenage daughter was pregnant before she told her parents ⁶.

This build-up of information creates a 'database of ruin'⁷, enough information that marketers and advertisers know more about your life and predictive patterns than any single entity. Databases that can predict whether you're expecting, or when you've moved, or what stage of your life or income level you're at... information that you have no control over where it goes to, who is reading it or how it is being used. More importantly, these databases have collected enough information that they know secrets such as family history of illness, possible criminal or drug records or other private information that could potentially cause harm upon the individual data point if released – without ever needing to know his or her name.

The corporate technological ability to track customers and piece together entire personal histories is a recent development. While there are several ways of doing so, the most common and prevalent method is with HTTP cookies. Invented in 1994 by a computer programmer, Lou Montulli, HTTP cookies were originally created with the shopping cart system as a way for the computer to store the current state of the session, i.e. how many items existed in the cart. These session histories were saved inside each user's computer and allowed companies to access and update consumer history constantly. Information such as where you clicked, how to you clicked, what you clicked first, your general purchasing history and preferences were all saved in your browsing history and accessed by companies through cookies.

HTTP Cookies

⁶ Forbes, "How Target Figured Out a Teen Girl Was Pregnant Before Her Father Did" (2012)

⁷ Paul Ohm, "Don't Build A Database of Ruin" (2012)

Cookies were originally implemented to the general public without their knowledge until the Financial Times published an article about how they were made and utilized on websites without user knowledge on February 12th, 1996 ⁸. This revelation led to a public outcry over privacy issues, especially since data was being gathered without the knowledge or consent of users. In addition, corporations now had access to information stored on personal computers.. At the center of the debate was the issue on third-party cookies, also known as "persistent" or "tracking" cookies. When you are browsing a webpage, there may be components on the page that are hosted on the same server, but different domain. These external objects then pass cookies to you if you click an image, link or article. They are then used by advertising and media mining corporations to track users across multiple sites to garner more knowledge about the users browsing patterns to create more specific and targeted advertising.

The current ruling for cookies and web privacy is under RFC 6265 ⁹ which explicitly allows user-agents and browsers to implement whichever third-party cookies by default, as long as the website has the Compact Privacy Policy published. One example of a third-party cookie is Modcloth.com. The domain, ModCloth.com gives the browser a cookie when you place an item in your shopping cart (1st party cookie), however since the website's images and other resources are hosted on Amazon servers it allows Amazon to input a secondary cookie to track your preferences and build information about you – thus, a 3rd party cookie. Different nations manage this problem of intrusive advertising and privacy issues. Under the EU Directive on Privacy and Electronic Communications¹⁰, websites require the user's explicit consent for the placement of cookies, storing and accessing information on the individual's equipment. In particular, Article 5 Paragraph 3 explicitly states that storing data in a user's computer can only be done if the user is given the right to deny the storing of cookies, and that they are given information on how the data will be used by the companies. In June

⁸ Financial Times, "This Bug in Your PC is a Smart Cookie"

⁹ Internet Standards RFC 6265
<http://tools.ietf.org/html/rfc6265>

¹⁰ EU Cookie Directive - Directive 2009/136/EC

2012, the EU adopted a position that allowed the use of cookies without explicit consent such as cookies used to store information during a process order i.e. billing information on a shopping cart as well as 1st party cookies such as logging in a user when they load a website. These types of cookies were allowed so long as they were not used for additional purposes, provided clear information about how they were used as well as security safeguards i.e. HTTPS or other forms of encryption. Comparatively, United States allows all forms of cookies including zombie cookies and 3rd party cookies so long as the website declares it in their Terms of Service (ToS).

There was a loud outcry by the industry after these measures were implemented. Responses ranged from pessimistic: 'far-reaching and incredibly onerous' to hysterical 'kill online sales' and 'kill the internet'. As such, the debate between data-collection, privacy, identity and how we are perceived online still continues on today.

The Vortex

It was these issues about privacy and surveillance that led to the development of Vortex, a data management game that allows players to swap cookies, change IPs and disguise their locations. Through play, individuals experience how their browser changes, live, when different cookies are equipped. Vortex is a proof of concept that illustrates how mesh-collisions gameplay exposes contours of a network determined by consumer behavior.

There is a fundamental question at the center of Vortex: **What happens when users are allowed to swap cookies?** These cookies, placed by marketers to track behavioral patterns, are stored on our personal devices from mobile phones to laptops to tablets, as a symbolic and data-driven signifier of who we are. In other words, to the eyes of the database, the cookies are us. They are our identities, controlling the way we use, browse and experience the web. Depending on cookie type,, they might follow us across multiple websites, save entire histories about how we navigate and look at things and pass this information to companies while still living inside our devices. If we have the ability to swap cookies, the debate on privacy shifts from

relying on corporations to follow regulations to empowering users by giving them the opportunity to manage how they want to be perceived by the network.

This does not mean a death knell for online shopping or e-commerce industries. For instance, if a user decides to go shoe-shopping for summer, he/she could equip their browser with the cookies most associated and aligned with shopping, shoes and summer. Targeted advertising becomes a *targeted choice* for both advertisers and users. Advertisers will not have to worry about misinterpreting or mis-targeting inappropriate advertisements i.e. showing tampon advertisements to a boyfriend who happened to borrow his girlfriend's laptop; and at the same time users can choose what kind of advertisements they want to see. (i.e. Summer is coming, maybe it's time to load up all those cookies linked to shoes and summer and beaches and see what websites have to offer; or disable cookies it completely if you hate summer apparel.)

On a more conceptual level, cookies are a form of media traces, tokens left behind during a browser-server exchange. By analyzing the types of cookies most frequently used and where they originate from, we can begin to see the layers of which networks nest and layer within each other, and how they relate and interact with users, websites, servers and other networks. By using cookies as our form of collision-traces, we can dig deeper and reveal previously unknown or unseen qualities of network operation. For instance, do certain types of users or cookie-identifiers linked to some forms of media or cultural production? What kind of cross-pollination is most likely to occur across several networks i.e. how many users who is both on 4ch, Higher Education and Vimeo? do they bring their content over with them when they move to a different space? do they create entire new identities? Or the question of online identities: how users create identities and identify themselves within networks, whether user identifies are cross profile (i.e. linking a Tumblr with a Facebook, and if the Tumblr content style/aesthetic matches the Facebook profile)

Therefore, the Vortex is an example or practice of how meshtectonics – as a theoretical framework -- could be used to analyse media environments. Using cookies an example of

collisions between various digital identities, we can begin to see how a network can be understood and the boundaries of perception. While both the Vortex and meshtectonics are researched as separate projects, they are based around the same concepts and are interdependent ideas that could not have been developed without each other. Meshtectonics provides the conceptual framework and toolkit necessary to understand and contend with the current debates and issues in a contemporary networked landscape; while Vortex is a specific demonstration of the theory in practice, how it can be used to analyse a particular media trace object as well as a way to present the questions concerning modern technologies.

4. Technical Documentation Overview

Vortex operates as a browser extension, where you can enable and disable the game at will. Each game account is linked with a browser, not an individual For instance, if you have Chrome, Firefox, IE and Safari installed on your laptop you technically have 4 game accounts where each account has an individual and unique hashed/SSID key used to 'swap' or transact the cookies.

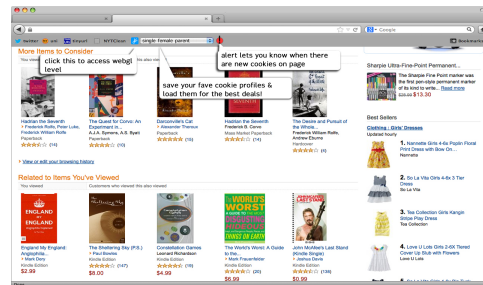
Players can also create 'cookie profiles' - for instance, Player1 realizes that a combination of X-cookie, Y-cookie, A-cookie + F-cookie yields a 20% discount on OneTravel.com for flights. S/He saves the profile as 'travel website use' and loads it every time they want to search for cheap airfare.

Front-end Interface

When the user first installs Vortex, they have to download the components separately. The first component is an executable program file, which allocates a certain amount of disk space as well as setting up a folder structure to house HTTP cookies and other information. This is a security precaution, so in the event that the user decides to remove the game or stop playing it he or she can disable it easily while keeping a separate history from the browser or user-agent program. For instance you may not want your session cookies or security cookies to be saved when

logging into sensitive websites such as online bank accounts.

The second component is the browser extension, which can be downloaded as an add-on extension and will be located at the top of the internet browser window.¹¹ During the first install, log in, separately, on both the executable program and the extension. After this initial log-in session, enable/disable functions can be directly accessed from the browser.



Basic functionality such as changing existing saved profiles as well as Cookie Alert are available on the browser window toolbar without switching to the Vortex game level. When the blue Vortex icon is clicked, a new window opens and reveals a game level generated by the website he or she is on.

Back-end Database

The back-end database comprises of several parts:

1. Chrome.manifest and XUL files to enable extension and identity change
2. WebGL and javascript code for the site miner
3. Simple send.php that allowed the exchange

I started with writing the WebGL script in 2012 autumn/winter, since at that time I wasn't sure what the final form of the project would look like except that I was very sure that I wanted to use WebGL to create my 'worlds' online. I wanted to be able to create large scale 3D worlds that could load quickly and was interactive, and also I was interested in how it was being written since it was not very well documented yet.

¹¹ The location of the extension will vary depending on the user-agent. For example, Mozilla's add-on bar is under Develop, while Safari is under Add-Ons.

Then afterwards it was just learning webGL from online tutorials and hard-coding it, with no libraries or external header files, so all the matrix arrays were embedded inside the code. After I gained a level of competency, I started looking at different libraries. At this stage my thesis concept was not fully fleshed yet, however I was very clear about wanting to represent source data as a kind of tangible material. WebGL was good for my purposes of representing materiality, it was fully interactive and could load quicker than Flash as it had `animateTick()` and `frameUpdate()` functions that checked for the refresh rate of the browser and would only data if it was new. Instead of constantly streaming or re-downloading something that was previously loaded, it would check if there was any change in the stream and download/add-on to the existing stream instead. This was really useful for me. It was also relatively well supported by HTML5 standards and the ability to generate 3D environments sold me.

In the beginning I looked specifically at Inka3D library. Inka3D library facilitates the use of Maya3D software to create environments, which can later be exported and initialised in webGL. I am familiar with the use of Maya3D and knew how to use it, so I was thinking of leveraging on existing knowledge instead of creating everything from scratch. If I were to make everything from scratch, it would take more than a year's work and I was already running out of time.

Later I switched to voxel debris library by Substack and MaxOgden's voxel engine as they provided better manipulation of geometry. These voxel-creatures were made by pre-defining a set of types, then mapped over with texture .pngs then repeated over an area to give shape. This library was later linked up with the WayBack API. The WayBack API is an Application Programming Interface (API) also known as a 'wrapper' that acts as a translator between one platform and another. In this case, I wanted to use the cache created by the Internet Wayback Machine to visualise that source data into mining planets of webGL script. The WayBack API basically creates units of javascript objects and load them into arrays, and then the webGL would run through those array types to produce the correct geometry type.

The next thing I worked on was the XUL and Chrome.manifest files. I chose to implement it

on Firefox for several reasons. One, it was entirely open-source and well-documented. Secondly it had great support for webGL interfaces, unlike Chrome or Safari where the sanity check meant that the webGL may or may not run depending on what was registered in cache. To learn how to build a browser extension, I simply went through all the tutorials on the Mozilla Firefox developer site and edited the examples until it worked. The main example I used was the LinkTargetFinder example which utilised a very simple javascript call to find a link attribute. As it was relatively simple to use, I replaced the link-targets with another external .js file that would call for the correct responses; basically I just used the XUL as an event-listener to call the appropriate js. when needed. Most of the actions in for the webGL and mining are all javascript based.

Systematically:

User → clicks extension button/toolbar → XUL code → calls for external .js script to run action → passes through .dtd translator → visualised on to user's browser

To create the profiles necessary and start the cookie swap, I first checked the file structure and the existing elements of Firefox. Firefox had a built-in identity profile manager, however it was very difficult to access as it required using the Terminal and typing a string to `'.../firefox-bin -p'` to get the window to pop up. What I did was simplify and allow access through javascript on the profiles.ini path and then when the user saved a new identity Firefox would automatically create another identity inside the profiles folder; usually `'asdf65123.name'`. For encryption and security purposes, I took the 8-digit unique identifier and then ran it through a hash-key from KeyCzar, a site that specialised in security to create my own player unique identifier.

Once the profiles and identities could be made, I moved into the 'how to make them swap' problem. I tried lots of things including `get.document.cookie` calls, `cookie.js`, pulling the cookies by scanning the network on Terminal¹², Python cookie environment and `wscgi`. and in the end I chose a very simple working solution. I used MAMP to create local servers inside the

¹² this worked, but it was incredibly insecure way since you were using machine code and passing to web code

Firefox Profile main directory, then initialised a transfer of contents using a ssh2 send.php script. Then I looked up how to refresh scripts and found a cron script example on how to make repeat pings, and just edited the cron script so that it would keep repeating the refresh on php.

5. Further Expansions

In the near future, there are a few things I would like to do:

1. add an ODOA feature in the code and mask Mac addresses, which would allow people to change their geolocations with a default setting of 'Narnia' the moment you start the game. Having a mac address masker would be convenient against advertisers targeting mac users specifically and help with disguising the type of browser.
2. create actual account logins and upgrade to a Python based back-end. Python was my original choice in how to execute the project – it would be safe, stable and also had a built in cookie/server environment as well as protocols to access lower level code. Also I found a Python to Javascript library (Pexpect) but only during the end of thesis and decided against it. If I had more time, I would re-implement everything in Python to create actual accounts that required users to log-in to their browsers before starting the game mode

6. Literature Review

One of the key ideas of using objects to trace networks is from Actor Network Theory. Latour's *Reassembling the Social* (2005) as well as Law's *After Methods* (2005), both of which deal with the methodology and philosophy known as 'Actor- Network Theory' (ANT). ANT proposes a new approach towards how societies can be analyzed; that instead of viewing an emergent society through the framework of traditional ideas such as 'social norms', 'social structure' and such – the emergent society should be allowed to form into itself, and the actants allowed to use their own language and self-define. In particular, Latour believes that sociology should be traced back to its roots, that is: by tracing the associations left behind by various mediators to see how a practice and

connections are formed, thereby creating a network.

Latour's main argument against traditional definitions of 'society' and 'culture' is that much of traditional social analysis relies on the assumption of a pre-existing 'social' that can somehow 'glue' all the disparate aspects together. ANT, he proposes, does not assume the existence of a 'social' but instead traces aspects of how a 'social' may be formed – the former therefore puts 'social' as the basis of how things happen whereas the latter suggests that social is a product of many traces, rather an end to itself.

In ANT, Latour proposes the idea of 'actants', 'mediators' and 'intermediaries' to describe the process of tracing disparate entities within a network. 'Actants/actors' are entities which have agency, forming associations and connections within a network. An 'actant' may be human or non-human, the determining criteria is whether it leaves a trace behind. For instance, a human actor may leave traces through conversations, relationships with other actors etc. while a non-human actant could be something like a computer, which stores web-history and leaves meta-trails on the internet.

"No actant is so weak that it cannot enlist another. Then the two join together and become one for a third actant, which they can therefore move more easily. An eddy is formed, and it grows by becoming many others." Latour, 1988

Therefore, diverse actant-networks form; where within these networks every actant is connected to, strengthens, influences and depends on each other. In this, we can see echoes of Haraway's concept of Cyborg Theory, where distinctions such as 'natural'/'man-made' are merely artificial distinctions. An 'actant' is similar to a 'cyborg' in the sense that it does not assume the importance of the human element, and does not distinguish between human/animal/machine.

The purpose of these actant-networks is not just to connect, but rather they also translate things such as concepts, skills, observations, shared interests' etc. into texts (in the form of statements) or objects (imbued with semiotic purposes) that help shape the power structure of the network⁵. This power structure is not fixed, but rather constantly in flux – or as Latour says: 'constantly negotiated'. Therefore, an actant-network can also be described as a 'translating

network' where 'heterogeneous engineers' use their agency to pursue and push for agendas in which they try to enroll, shape and manipulate other actants towards.

"Nothing is, by itself, either knowable or unknowable, sayable or unsayable, near or far. Everything is translated."

Latour, 1988

The importance of actant-networks and how it differs from traditional 'society' is that Latour, Callon and Law assert that humans and non-human participants are equal actants in terms of semiotics, as both can be defined by how they act and are acted on in a network of practice. The assertion is not so much about how humans and non-humans should be treated equally in research; but rather now all actants are defined through their relationships as intermediaries, functionaries, mediators and such in a network.

The implications of ANT are three-fold. First, the approach is at a grassroots level. Instead of assuming an existing framework, it allows the framework to emerge from the network itself and therefore does not resort to the usual dialectic binary or dichotomy within critical discourse. Second, it removes any distinction between human, animal and machine as it defines the network participants through their actions and others' actions on them. Third, it notes that because networks are generally not localized and that semiotic artifacts are often obligatory-passage points (OPPs).⁷ ANT rejects the idea that events occurring nearby within space and time are more important than those in a distance, therefore suggesting that events occurring further may have more impact than events occurring close by.

Besides Latour, the two other major scholars in ANT are Michel Callon and John Law. In John Law's *After Methods*, he questions the basis of 'research methods':

'.....It is that methods, their rules and even more methods' practices not only describe but help produce the reality they understand.'

'...Nevertheless, the 'research methods' passed down to us after a century of social science tend to work on the assumption that the world is properly to be understood as a set of fairly specific, determinate, and more or less identifiable processes.'

Law, 2004

Unlike Latour, he defines most of his argument of ANT as a tool to augment current social science methodology, suggesting that there is no absolute framework and that such methods should simply be used as fit depending on the case at hand. Also, his interpretation of ANT can be summarized as a material-semiotic process where ANT maps the relationships between objects (material) and concept (semiotic); assuming that both relationships occur simultaneously as well. In this respect, his version of ANT is most similar to Deleuze's philosophical stance known as 'material intelligence'.

Though Deleuze is most famous for his work, *A Thousand Plateaus* (with Guattari, 1987) where he describes knowledge as rhizomic; in his other text, *Pure Immanence* (2001) discusses the idea that materials and possibilities meet on this 'plane of immanence' and therefore forms an 'event' out of many other potentials – a collision between the 'virtual' and 'actual'. He also mentions that no event can be made by itself, but rather is it a collaboration occurring between two colliding forces – the material's own agency and the other actant (human or otherwise) which results in a temporal 'event', one out of many other possible events on this plane of immanence. Art or the creation of art is therefore a collaborative process between the artists' hand and the qualities or affordances of material, to create 'monuments' of time; which he defines as art.

Besides studying both Deleuze and Actor Network Theory, another theorist that greatly influenced this direction and formulation of Meshtectonics & Vortex is Flusser's *Towards a Philosophy of Photography*. In his text, he describes how most apparatus operated within a program. This program could be hidden or obscured by a 'black box' mechanism, where a user would input a value and only see the output but not the process of how it was made or converted. These abstract programs constituted as a plane of possibilities that are too many for an individual to conceive of, but limited by the technological processes and limitations of protocol.

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XUL reference: https://developer.mozilla.org/en-US/docs/XUL/XUL_Reference?redirectlocale=en-US&redirectslug=XUL_Reference

Substack@github: <https://github.com/substack>

Max Ogden's Voxel Engine:
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