

STARTS Residency Public Report

Invisible Agency

Stanza 2019

I.INTRODUCTION

STARTS will do the final formatting of your paper.

Your paper should target 4 pages but this is not mandatory and it can be as long as 6 pages (approximately 3000 words).

Invisible Agency. Alternative Visions of Reality.

Invisible Agency is a series of dynamic artistic data visualisation interfaces connecting real-time city spaces all investigating data manipulation across distributed technology networks. These aesthetic experiences each facilitate a new understanding of the networked data space and the landscape these technologies inhabit.

As part of the residency various types of data are harvested from the city in real-time connected to the idea that the city is a performative stacked multi-layered data space, in which we are all complicity and continuously interacting as part of this agency.

The investigations initially focused on smart city sensor data and then other forms of real-time data from so called smart city and included global pollution and environmental data. However because Wavecom (my residency host) are a specialist WiFi integrator I have been drawn to investigate WiFi signals and their ubiquitous presence in the urban landscape.

WiFi is in everyone's pocket (phones). We are implicitly related to the data structure and the wider network within the environment by our own mobility. The liquid flow of the binary world can be evidenced from numerous fixed devices that are now everywhere. Therefore WiFi acts to integrate the body into the wider technological landscape. The 'body' becomes invested inside the 'data space' by the devices we carry and connects to these wider stacked networks. The body is now complicit in this constantly observed

relationship. Therefore by default we enter into a dialectic with all of these other devices via beacons and other monitoring systems.

II.ARTWORK

Present the Artwork, including relevant background, in language accessible to a general audience. Define the goals of the residency and the main outcomes.

Several art-science artworks have been created during this residency that overlap disciplines and are evidenced as data visualisation, art systems, and software that all in turn monitor public space and serve to question both the politics of space and urban geographies via these ubiquitous technologies which are embedded in the landscape. The artworks created all re-purpose data to raise further questions about the fluid, liquid, real time data space, that now surrounds, envelops, and monitors us everywhere. Further questions raised include:- Who owns the data, who does this space belongs to? What is the future of this technologically stacked interlocking mediated environment?

Three experimental prototype artworks visualise this city wide agency as a collective, performative, and collaborative experience were produced

1. Collisions of The Now. The Orchestra Of Data. Sonifications of the WiFi signal.

The system created reforms the total WiFi (an area in range) as an orchestra of sounds. The signals in range are remediated into the WiFi orchestra. The connected devices interpret via sounds all the WiFi activity in range of these devices. If you turn your phone on you trigger an event in the orchestra. This becomes a participatory music construct derived from the invisible agency of the (your) surroundings. The artwork is prototype for bigger version. <http://stanza.co.uk/orchestra/index.html>

2 Invisible Agency. Landscape of The Now. Systems of Causality.

This artwork demonstrates and discloses WiFi traffic as an electronic systems artwork. With customs electronics and visualisation of all WiFi activity in range which is morphed to a map. Essentially it's data formed into a responsive generative new media artwork. <http://stanza.co.uk/invisibleagency/index.html>

3. Entangled Stack. Visualisations of the invisible multilayered data stack.

Software visualisations using Wavecom data, Portugal mapping data and pollution, weather, and environmental data also from Portugal. A living software system of live real-time data from portugal demonstrating collective agency.

III.METHODOLOGY

Methodology used to produce the Artwork.

In order to facilitate this project I was working with my host Wavecom in Portugal. After initial meetings and emails the parameters of a possible series of projects based around my themes of living data evolved. After this I requested data in relation to the ideas discussed, that would form the collaborative co-creation effort. After lengthy dialogue I was eventually given some online API access via the Wavecom system which included dates /lat long/ and users/ (via heat maps). However I noted that within this online system from the dashboard login there is also:- device types/ languages/ groups /NAS location/ Cafe/ portal segment data etc. I requested more access as all of this would enrich the artwork and would further enable me to build a better bigger visualisation, as a living 3d system. The artwork will become in essence representation of the WIFI activity in the whole of Portugal, a portrait of the country.

The software is a 3d living artform that shows the complete data system stack generating all at once. I also decided to look beyond this specified residency collaboration and researched many other smart city real time data sets via online calls.¹

The data feeds end points that Wavecom gave me were extracted and reformatted into a version of a Stanza.API. Provisional design thoughts for a networked client API for Stanza artworks include all transports as per the existing and battle-tested API currently supported at velocity.stanza.co.uk: AJAX requests with endpoints for the various levels of data, with a WebSocket interface to stream additions to or alterations of the data. All data is assumed to be tree-structured, but it's not necessary to fetch an entire data tree at once (and we'd need to support incremental changes for the WebSocket feed anyway). So data is fetched from the root, and the response contains UUIDs which can be used for subsequent requests (with further UUIDs), and which will appear in WebSocket updates. (So far this roughly matches the existing Velocity API.) All transports as per the existing and battle-tested API previously supported in other artworks. AJAX requests with endpoints for the various levels of data, with a WebSocket interface to stream additions to or alterations of the data.

¹ Getting dynamic data off my host was proving difficult so I also looked elsewhere. *Scattering of sensors in the city is not as widespread as I believed either that or this costly endeavor is kept private (another form of panoptic surveillance) maps. I opted to build my own API and integrate whatever data I could get that was dynamic.*

A rough generalisation of the data is that every node has:

- type: denotation of the kind of node
- optional positional information attributes (X/Y or possibly X/Y/Z) - with some indication of format (latitude/longitude, units of scale, ...)
- optional parseable time information attributes (time created or updated, time at which data is no longer valid - useful for data with time ranges) - all in a standard format (ISO 8601 or similar)
- a set of additional attributes: (textual or numeric, or arrays of same)
- “child” data nodes, all named (and initially delivered as UUIDs for subsequent data fetches)
- metadata explaining the format of the attributes - for position information this might include the overall data range for a particular source
- A child data item may actually be a sequence of nodes. (Some data sources return nested vectors of data - these could be delivered directly or, for deeper nesting, recoded as child nodes.

```
node = {
  "type": string
  "position": [x, y, z]
  "start": timestamp
  "end": timestamp
  "attributes": {
    attr1name: value
    attr2name: value
    ...
  }
  "children": {
    child1name: <node>
    child2name: [<node>, <node>, ...]
    ...
  }
}
```

IV.CO-CREATION PROCESS

Describe the functional aspects of the residency and the role of each partner, including resources, communication and production means.

Part of the co-creation process from Wavecom involved development of a separate script so that I could find the data in their system myself. This involved the creation of a python script so that I could eventually see the data I needed to use.

V.IMPACT

How the residency impacts both parties.

The *residency* allowed me to spend time researching and developing an idea that I have been cycling around for the past nine years and was first presented to the AHRC as a follow on funding project. IE the development of layered stacked data in 'The Third Space'. This prototype format and the communities of data types it incorporates will run through future works and serve not only to aid conceptual development but also acts to provenance these media artworks since all these data now come from my STANZA.API. In addition this also allows AI and machine learning that can be imposed on the data to be executed which poses new questions concerning the governance and accountability of data in public space.

A.Research Impact

Explain how the innovation could impact practice and ultimately improve Tech Project outcomes.

Companies that are open to ideas might see new ways technologies can impact on their core projects and therefore business through this implementation. In several presentations recently two British companies have seen this potential to use my artworks as frames to collaboratively explore the feedback of varying data systems and I am currently exploring this further.

B.Artistic Impact

Explain how the innovation could impact practice and ultimately improve artistic outcomes.

Several new concepts were developed and the model for my methodology for future artworks was refined.

VI.ART-SCIENCE INTER-RELATIONSHIPS

Beyond technological bridges, mention the shared ideas placing your collaboration in a general framework of art-science relationships.

We discussed various data types from several systems and explored a general framework which speculated on several artistic outputs. I also look beyond my collaborators to establish new links in order to further explore the core concepts of the original proposal.

VII.FUTURE DIRECTION AND ACTIONS

What are the next steps after the STARTS Residency program?

I am working on several development of my systems based data artworks. I have also developed another relationship with a company who is extremely open to collaborating with their data which they have already released to me.

VIII.CONCLUSION

A.Concluding Remarks

I am continuing to develop the API and I will fabricate several more artworks in this series.

Acknowledgment

Stanza
www.stanza.co.uk