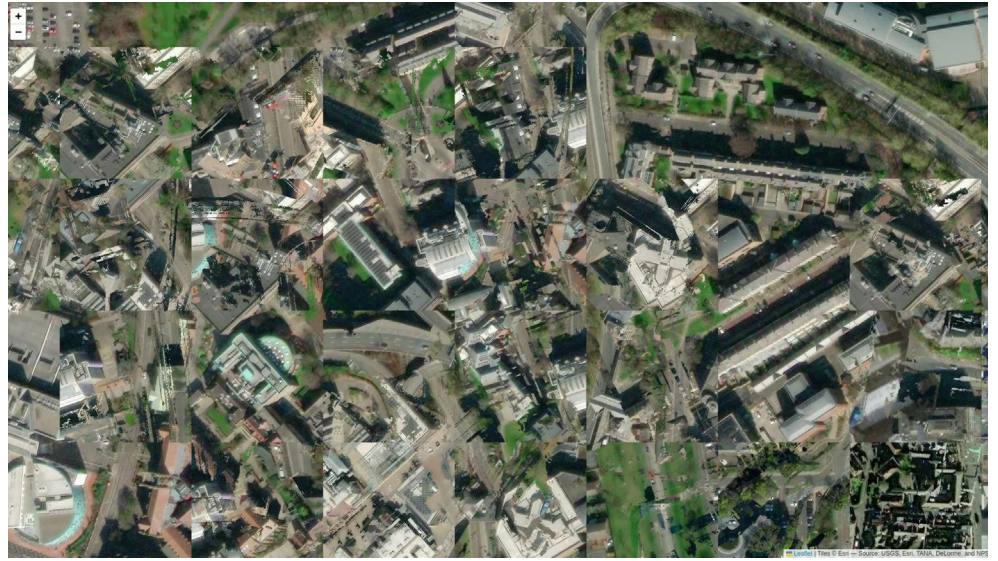




# Everywhere I Have Never Been except There



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*Everywhere I Have Never Been except There* is an interactive artwork that uses security vulnerabilities, crowd-sourced data, and image processing to create maps of imaginary hybrid spaces. Wi-Fi-enabled devices while searching for available networks leak unencrypted lists of the names of networks to which they have previously connected. The work refers to a look up database of geolocated Wi-Fi networks and produces maps which blend tiles from locations where the network has been observed. Rather than acting directly as a comment on network security, the piece uses the uncertainty of data pattern-matching as the basis for a spatial imaginary.

**Keywords:** Networks, Privacy, Maps, Probe Requests, Space

## Description

*Everywhere I Have Never Been except There* is a two-channel interactive artwork commissioned as a live interactive for an arts festival in the U.K. (see Fig. 1). It examines signals from the smartphones of passers-by probing them for their own spatial histories, told through records of past networks they have connected to. Instead of using this information as the basis of security attacks the work uses the resulting network of global locations to imagine new hybrid spaces, brought together by shared network names.

**Figure 1:** Installation view.



## Background

It is now commonplace to remark that our smartphones provide ongoing leaks of personal data to third parties but most users assume that this is information that they have at some point volunteered, for example through submitting forms. Less well known (among less-technical publics) is the fact that some of the most basic connecting protocols of modern networking necessitate the exposure of potentially revealing information. So-called 'probe requests' are sent by clients such as smartphones when searching for network connections. Among the data broadcast is the MAC address of the device (which is unique) and a list of known network names (SSIDs). Although modern phones often disguise or falsify the MAC address and shorten the list of network names broadcast, the latter can sometimes be used to infer a person's home address. A large database of observed network names with the corresponding geographical location is compiled by contributors to the database and website wigle.net and a sufficiently unique name can be used to support and educated guess as to the location of a person's home network.

Other artworks have taken the leaked data frames produced by wireless devices as their subject matter, their material, or both. The artist Stanza produced *Invisible Agency* in 2019 which combines circuitry, lighting and small displays to visualise probe request data (Stanza 2019). *ProbeKit* (Dorsey 2016) is both an installation artwork and a downloadable tool which allows one's own computer to monitor probe request (by switching the WiFi card to promiscuous mode). The installation version visualises the resulting data frames as animated butterflies. *Linger* (Van Loenen n.d.) adopts a poetic response to the presence of probe requests in everyday spaces while offering a subversive response to those attempting to use them for tracking purposes. The devices produced by the artist collect and rebroadcast probe requests making it appear that the devices remain in the space (hence the title, linger). In a sense, the device convenes a crowd of ghost digital devices hovering around the user. Finally, *Shenanigans* by David Rueter (n.d.) takes this idea to an extreme and allows participants to submit their device MAC to a network of devices that will broadcast it in a number of locations, thus making it impossible to definitively geolocate. Participants are issued with a handsome certificate of 'de-identification'.

**Figure 2:** Video of the installation (<https://vimeo.com/757478303>).



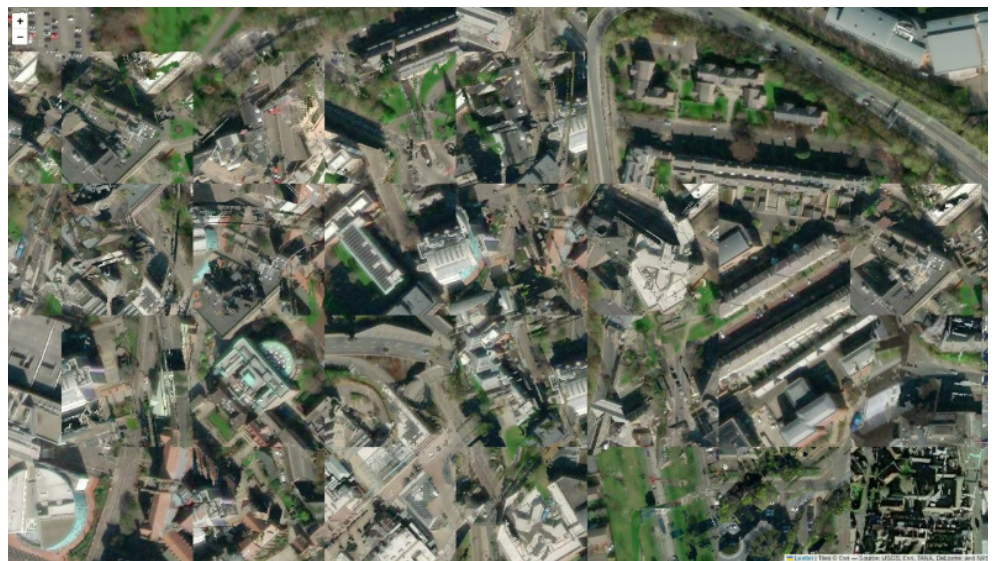
## Interaction

*Everywhere I've Never Been except There* departs from these artworks by taking on the uncertainties of available technologies of surveillance as the basis for a visual imaginary. Often the network names identified in probe requests return multiple locations when queried in the wigle.net database where the same SSIDs are in use in different parts of the world. In a speculative move the work asks what a world where those places infused or inflected one another might look like when mapped.

Interactions with the work take place without the consent of device owners and proceed as follows: Probe request frames are detected

by an ESP32 micro-controller and the data is sent to a piece of controlling software which performs a look up in the wigo.net database. One channel of the installation, a computer terminal, narrates this process by printing the various stages such as 'new network names found' or 'searching for network locations in database' to the screen. If the database returns more than a single match the resulting latitude and longitudes for all matching SSIDs is sent to a JavaScript based webpage which displays a map. Using an open-source satellite map provider the work retrieves map tiles from the matching locations and produces a composite tile using various thresholding techniques overlaying them on one of the original locations, chosen at random. The map pans and zooms between locations found zooming to the most recently found space and then choosing randomly from the history composed throughout the installation.

**Figure 3:** A Screenshot showing the map element of the installation.



### **Aesthetics**

The resulting maps produced by the amalgamation of these diverse spaces are fragmented, ruptured, glitchy and occasionally provocative (see Fig. 3). For the most part, the tile chosen as the base map for the image comes through the compositing process most strongly and this provides some visual continuity across and between tiles. However, the overlaid features are often jarringly at odds with the landscape found underneath. Elements of brutalist architecture overlay country cottages. Jagged outlines containing only the texture of a motorway are laid across a river or through green spaces. The spaces in question are connected only by the coincidence of networking naming conventions and thus for the most part are, to a large degree, random. Some specific results however give clues to the hybridity of contemporary technologized spaces. 'Free Airport WiFi' for instance overlays a number of generic airport spaces with fragmented parts of planes, runways, traffic control towers and the like.

*Everywhere I've Never Been except There* aims to generate curiosity as well as suspicion in audiences. By featuring their own network names on the terminal screen as they are discovered by the software the work provides a concrete indication that their data has been captured. By using this as the basis of new geographical imagery the work moves away from literal reflections on security (however valid these may be) to the production of a new aesthetic.

**Acknowledgements.** The artist acknowledges the help of Dr David Chatting in adapting existing code resources to filter for probe requests.

### References

**Dorsey, Brannon.** 2016. "ProbeKit". *GitHub*. Accessed 25/1/2023. <https://github.com/brannondorsey/ProbeKit>

**Rueter, David A.** n.d. "shenanigans.io Electronic counter-measures for everyday life". *Shenanigans*. Accessed 25/1/2023. <http://shenanigans.io>

**Stanza.** 2019. "Invisible Agency". *Stanza*. Accessed 25/1/2023. <https://www.stanza.co.uk/invisibleagency/index.html>

**Van Loenen, Jasper.** n.d. "Linger". *Jasper Van Loenen*. Accessed 25/1/2023. <https://jaspervanloenen.com/linger/>