

## DATA ECOLOGIES: *LAIKA'S DÉRIVE* AND DATAWORK

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### Abstract

Today the affordances of contemporary data representations and presentations allow for the reading of complex relational works, which I am classifying as data ecologies. Data ecologies can be performed with and across spatio-temporal networks of relations, and can be understood as assemblages of the agentic quality of flow. Data ecologies connect with the rise of statistical thinking throughout the nineteenth century, and developments in technology into the twentieth and twenty-first centuries. In this paper data mapping and data mining strategies are explored to develop a concept of data ecologies in interactive, reactive and generative creative works.

**Keywords:** data, data visualisation, data visualization, data mapping, data mining, interspecies communication, psychogeography, Laika.

Data ecologies are the process of creating a relational flow, assemblages of data, and can be used to describe the role of data in new media works. Although data ecologies may include procedures and processes from data mining and mapping approaches, within them data may be conceived of in ecosophical terms. Processes become relational within the strategy of representation. The work of data ecologies is to address and re-present relationships as an ecology, including the data “collection” methods as an intrinsic component of the work. This paper takes a recent project, *Laika's Dérive* as a starting point for thinking through a concept of data ecologies [1].

In an era of post-media aesthetics, there is a need for further examination of the strategies by which “a cultural object organizes data and structures the user's experience of this data” [2]. Wright has also correctly pointed out that “Visualisation is usually separated out as a tool for knowledge formation rather than a visual form of knowledge itself” [3]. The affordance/s of contemporary data presentation allows for the reading of complex relational works, which can be classified as data ecologies. These are located in current debates and discourse about mapping, data mapping and representation (from both the Visualisation field and Software Studies) and intersect with concepts about the representation of space/place in new media contexts. From this perspective it can be seen as an art of networks, and of territories that can be

rendered as a mapping of temporal flows and relationships that remain fluid and dynamic within a system. Rossiter outlines these issues succinctly in his outline for a “processual media theory” which posits the need for a politics of time within processual systems [4]. We could extend this further into a politics of process within processual systems.

*Laika's Dérive*, a locative data mapping and capture work about interspecies communication, collaboration and knowledge, is one example of data ecology. The project has had two iterations thus far, at Performance Space, Carriageworks, Sydney, Australia (2011) and most recently at Furtherfield Gallery, London, UK (December 2012).

On November 3 1957, the Soviets launched Sputnik 2 into space. On board was a dog, Laika, in a cramped cabin with space for standing or sitting only. She was in a harness, with electrodes attached to measure her vital signs; heart rate, breathing, water and food intake. The data was transmitted back to earth via early telemetry. The mission provided scientists with the first data on the behaviour of a living organism in the space environment. Unfortunately Laika survived for only a few hours instead of the planned ten days due to heat and stress. There was never any plan to bring her back to earth.

Laika embodied multiple meanings, as a symbolic action, on both sides of the Iron Curtain. In simple terms, “For the Kremlin, her mission commemorated the fortieth anniversary of the ‘great October Socialist revolution’ and she emerged as a canine hero of the Soviet Union. Gaz-

ing up at the night sky, many Americans saw the small dog as a terrifying declaration of Communist technological supremacy and American vulnerability”[5].

In looking at the data captured from Laika on Sputnik 2, we can know that she had an accelerated heart rate and that she ingested food. If we map cabin temperature and humidity readings using standard data mapping techniques, we can extrapolate that she was stressed by heat.

What we can't know from this is the depth of her experience. The data can tell us however, that the intention of the Soviet experiment was to support physical life in space. The collection of the data can also tell us about a species in what Donna Haraway calls an “obligatory, constitutive, historical, protean relationship with human beings” [6]. The intention and greater ecology of the data methods of the Laika mission tells us more than the data itself.

In my recent (ongoing) project, *Laika's Dérive*, community participants and their dogs use an electronic mapping system to collect data, including sniff location, pathway, head position and photographs, to explore a psychogeography of place, and to provide an alternative mapping of place [7]. Unlike the original Laika, this project was designed as a collaboration between species, and a gentle nudge towards recognizing the primacy of human senses and sensing in environments.

The project involves developing data mapping technology to map the dog interests and journeys. Simply, the system is designed to facilitate inter-species

Fig. 1. Laika in Sputnik 2. (Public Domain, NASA)



communication through translating canine smell senses to human visual ones. The system design for this project uses the dog's olfactory capabilities to select photographs from the *dérive* and to present these back to the human participants as a record of a shared journey. To do this the accelerometer and time data identifies areas of most interest, mapping those peaks to the geo-tagged photographs. Those photographs are then displayed online as a photographic record of the journey. The data is also used for a sonification and visualisation of the smell activity, a map of dog sensed place, and a Google map presentation of the data.

While walking with dogs, the psycho-geography of place is changed and amplified, you are more aware of boundaries, dangers and the simplicity of enjoying both the moment, and the everyday. By collaborating with dogs and their differing perceptions and sensual capabilities, we are expanded from the everyday, and from the limits of our everyday human perception.

While the data collected from *Laika's Dérive*, and the visualisations developed from that data may tell us something about the most enjoyable spots for dogs in an environment, the data collection method, and walk, provided a subtler form of knowledge development. This is not necessarily captured in the data visualisation, or in the database of over 30,000 photographs taken by dogs, and the many gigabytes of location and accelerometer data that informs those photographs.

Participating in the project enabled users space for reflection. The project is very much about data process, not representation.

*When Species Meet* [8] is an extension of Haraway's *The Companion Species Manifesto* and continues to develop her previous work on technology, nature, and culture. It is particularly relevant to a discussion about interspecies communication, and data gathered from such provocations.

Her exploration of our co-species existence is guided by two main questions that she outlines in her introduction, "(1) Whom and what do I touch when I touch my dog? And (2) How is 'becoming with' a practice of becoming worldly?" [9]. Haraway argues for an epistemological and ontological shift to recognize non-human animals as agents that can also shape human lives and proposes that this co-constitution requires an ethical call for respect and responding "to and for those other primate beings" [10].

Ultimately, Haraway finds that respect, curiosity, and knowledge spring from animal-human associations and work powerfully against ideas about human exceptionalism. *Laika's Dérive* was developed as a result of this thinking, and is meant as a collaborative communication tool across species for data mapping place for humans; a data ecology that explores place, sensing, embodiment and representation.

To contextualise this, the following will summarise how we might think of data and where we might place "data ecologies" in all this.

## Data

It is useful to understand that data are values, and embody values. Data often refer to measurements, observations, images and other raw materials. Data however is more than an "objective" measurement, more than raw material.

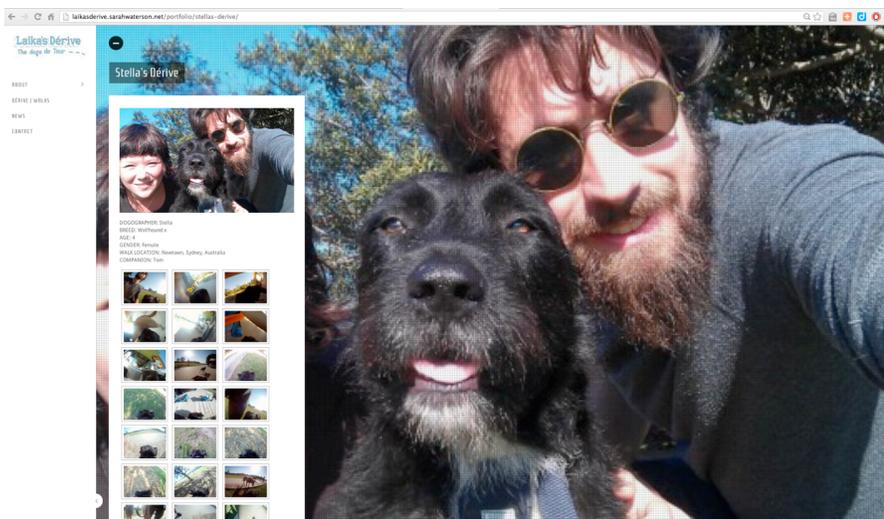
Data itself has a qualitative component. Data, like knowledge, is "situated, partial, and constitutive" [11]. The measurement itself carries its own meaning, particularly as a stand in for the thing, and the instance in time, that it is measuring. An example of this might be the geo-location of a timed event, such as the recording of a dog sniff. What we see as a plotted moment on a graph is not an objective datum, but a qualitative data of that dog's embodiment in time, the recording methods, techniques and intentions of that moment and the interpretation of the viewer.

Despite this, within the field of data visualisation, data itself traditionally has no meaning. For data to become information, it must be interpreted and take on a meaning. It needs to be presented, be it a spreadsheet, table, pie graph, or raw values scribbled on a napkin. For example, the sniff location of a dog could generally be considered as "data", a visualisation of that sniff on a map may be considered as "information", and a report containing practical information on the best way to find that sniff spot may be considered as "knowledge".

To build on this approach further, and giving consideration to data as a qualitative component, strategies to present that "data" should attend to that qualitative component, and recognise its provenance. Given this, data then can be thought of as being entirely about relations, and not about information *per se*. In considering a concept of data ecologies, we would then also include the processes and methods of the data production, and reception as part of the data presentation.

Alessandro Ludovico and Paolo Cirio's online and installation project *Face to Facebook* is also an excellent example of a work that exposes the provenance and data ecology, by representing the data in an alternative form and system [12]. *Face to Facebook* involved appropriating 1 million Facebook profiles, filtering them with face-recognition software, and then posting them on a custom-made dating website. This repositioning of the market value of the data into a new system of relations draws attention to the broader ecology of the data. This work can be seen to be a data ecology in that the data re-presented is entirely about relations, not information. Within the exhibition component of the work, a system diagram displays the data pathways and treatment. This again emphasises process over product. That the dating site works

Fig. 2. *Laika's Dérive* participant page. (© Sarah Waterson)



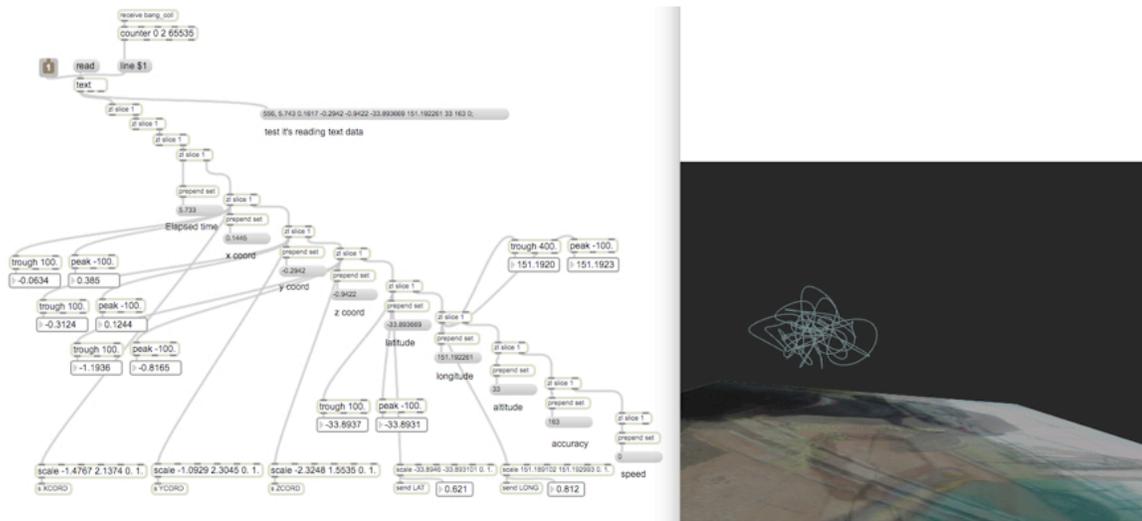


Fig. 3. Laika's Dérive sniff visualisation screengrab. (© Sarah Waterson)

with the data from Facebook, exposes an assumption that the Facebook profile photo data is there for dating or attractiveness.

The bias in the choice of the image for representation is a key component of the data ecology. It provides a commentary on Facebook profile data by representing an assumed desire of users to be attractive to others.

### Information visualisation, Data visualisation and Data Ecologies

The strategies and techniques used for creating artworks from data provide one way to investigate the cultural materiality of that data, and to give aesthetic form to *human* experience within a world of information.

A Manovich model would say that the data visualisation is about finding all of the datasets, scraping them to reveal information, and then bringing everything from metadata through to image rich media into another context in order to be able to make sense of the data in question. This needs to be critiqued to include the broader ecology of the data, and to recognise it as an ecology, not a material to be strip-mined for usefulness (pattern and so forth). If we are to consider the ecology in its broadest sense, the shared record of the data, and the assemblage of all experience of the collection and re-presentation, i.e. both the provenance and the future of the data ecology, then feedback loops, complexi-

ty and chaos theory, dissipative structures and autopoietic, or self-organising, systems need to be included as practice starting points, other than pattern recognition and counting. *Face to Facebook* in re-presenting existing data in an explicit context provides an opportunity to reflect more fully on the data in question, and its broader ecology [13].

Thrift's non-representational theory challenged geographical research to go beyond representation, basically a call for looking at practices, rather than focussing on what is produced [14]. That is, a theory of movement that is useful to the representational strategy applied to data. The stress here is on performative and embodied knowledges, processual rather than representation and interpretation. Lorimer suggested the term 'more-than-representational' to replace 'non-representational' to better describe the concept [15]. The practice of data in *Laika's Dérive* responds to this, focusing on the collaborative *dérive* (process), rather than the data produced and collected. Both the representation/s produced for the project, the online photographic journeys and the Google map presentations are in some ways incidental to the project itself, which was designed as a reflective process.

So to contribute usefully to information visualisation practices in new media works, we need to enter into a relational understanding of data, and

extend beyond data as a thing, to data presentation as a processual practice.

Data mining and data mapping are about processes and techniques of working with data that drive certain visualisation outcomes, but neither is particularly good at capturing a flow of data, or temporal shifts. De Landa's writing on the assemblage – including the material role, expressive role, territorialisation and deterritorialisation (consistent with Deleuze and Guattari) aids as a starting point for locating the conceptual practice of using data streams as an ecology for generating emergent behaviours, patterns and affect [16]. Data ecologies can be performed with and across spatio-temporal networks of relations, and can be understood as assemblages of agency. The previous example, *Face to Facebook*, can be seen as a successful strategy in generating a new assemblage that plays on the greater ecology of the data, including its collection techniques and presentation strategies.

Whatmore's 'hybrid geographies' also speaks about the complexities of formations, and is useful in conceiving of the non-human [17]. Further to Thrift and Whatmore, Actor Network Theory (ANT) is also being used as a way of exploring the relational ties within the artwork, and as a way of looking at the practice as process and processual thinking, rather than the materiality of what is produced. This ties in directly with the idea of data ecologies. As Latour notes,

“explanation does not follow from description; it is description taken that much further.” It is not, in other words, a theory of anything, but rather a method, or a *how-to* as he puts it [18].

Bennett also takes up ANT with a call to action, where she says: “we need not only invent or reinvoke concepts like conatus, actant, assemblage, small agency, operator, disruption, and the like but also to devise new procedures, technologies, and regimes of perception that enable us to consult nonhumans more closely, or to listen and respond more carefully to their outbreaks, objections, testimonies and propositions. For these offerings are profoundly important to the health of the political ecologies to which we belong” [19].

The data capture mechanisms within *Laika's Dérive*, the *dérive* itself and the behaviours surrounding the data presentations also perform as assemblages of agency within this model. Power relations inherent in the data sources are explored, to develop an assemblage of actants where power and agency is not equal- but carefully “designed” to represent Bennett’s “politics” of things where she emphasises the “active powers issuing from non-subjects” [20]. Data ecologies can include systems that evolve over time, environmental factors, and interactions.

This paper is a starting point for looking at data ecologies, and thinking about how they might perform in new media works. We are enmeshed in data ecologies that are more complex and generative than we are able to perceive or present. Despite this, strategies to present “data” should attend to the qualitative component of data, and recognise the provenance of the data and the collection methods. We can see that data can be thought of as being entirely about relations, and not about information *per se*. Those relations, in the example of *Laika's Dérive*, can include the non-human and the processes employed within the work. They provide a representational strategy for communicating complexity and developing poetic systems of knowledge made relevant to a data saturated world.

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