

# Fostering Care and Peaceful Multispecies Coexistence with Agential Provotypes

## Raune Frankjaer

Dept. of Digital Design & Information Studies, Aarhus University  
Aarhus, Denmark  
frankjaer@cc.au.dk

### Abstract

Human societies are deeply entangled with biotic and abiotic entities that constitute and sustain our life-world, consequently to address peaceful coexistence within and between human societies, necessitates addressing a much broader issue: peaceful multispecies coexistence and the end of environmental violence. Key to this is a change of the present dominant neoliberalist ontology, which is wreaking havoc on the planet, socially and ecologically. This paper introduces agential provotyping as a catalyst to prompt a dialectic process of reflection of the assumptions and beliefs, which constitute the foundation of our present exploitative and human-centered value system. Agential provotypes are tools of subversive design practice, which are readily accessible design artifacts aimed at a broad heterogeneous public that reveal the taken-for-granted elements of the human life-world through playful interaction and aesthetic experience. The paper starts by explicating the relationship with provotyping as emerging from systems design and positions agential provotypes in relation to critical design. It thereafter demonstrates agential provotyping on the basis of an interactive installation consisting of digital artifacts and plants; finally it discusses the impact of the agential provotype on interactants' beliefs and assumptions and their development of empathy towards other lifeforms in their environment.

### Keywords

Agential provotyping, Subversive design, Emotional design, Empathy, Interactive installation, Public space, Ecology, Ontology, Plant sentience, interactive artifacts.

### Introduction

This paper introduces the notion of agential provotypes as a tool to foster respectful multispecies coexistence. Originating in systems design, provotypes are prototypes used at the front-end of a design process to reveal hidden tensions in a given design context. They do so by provoking experiences of phenomena, which under normal circumstances are presumed and so remain hidden (Mogensen, 1992). This paper suggests an extended form of provotyping, *agential provotyping*,

where the provotypes are deployed to reveal invisible, yet paramount aspects of reality thereby encouraging a re-evaluation of current practices and ontologies.

The significance of a certain system of resource management lies in its conceptual foundation: whether natural resources are overexploited, conserved or used sustainably, is an ecological expression of socially and politically defined institutions, norms, values and structures (Dove & Kammen, 1997; Pretty, 2003; Rist & Dahdouh-Guebas, 2006; Veeman & Politylo, 2003).

Humans are not discreet beings. As individuals we are immersed in a more extensive micro-biome, consisting of multiple entities outnumbering the number of cells within the human body itself and without which, life could not be sustained (Sender, Fuchs, & Milo, 2016). Correspondingly, humans as a species are deeply entangled with and dependent on both the biotic and abiotic entities that constitute our life-world. In consequence, to address peaceful coexistence within and between human societies needs the addressing a much larger issue: ending environmental violence and cultivate respectful multispecies coexistence.

### Structure of Paper and Research Approach

After a short introduction to the currently dominant ideological system, neoliberalism, this paper presents an agential provotype, an interactive artifact co-created by the author, deployed for public engagement and interaction with plants, whose activities are imperceptible to humans. The presented agential provotype, Flora Luma, utilizes sensing technology to harvest environmental data, which is then presented visually to captivate spectators' interest by its aesthetic quality. Only as a second step is the meta-layer at the core of the installation revealed. The intent of this approach, which we call tactics of aesthetics, is to promote biodiversity and champion the notion of multispecies coexistence

in a playful and enticing manner. The notion, *tactics of aesthetics*, promotes the idea that engagement through experiential beauty is a powerful tool with which to foster empathy and care. These being the foundations of conservation and will be farther elaborated in this paper.

The paper positions agential provotyping as a type of subversive design and discusses it in relation to critical design.

Finally the paper shows how the encounter between humans and plants, facilitated by the agential provotype challenges the present perception of a clear separation between nature and culture. It draws on the observations and conversations which occurred at a large-scale public exhibition. The paper demonstrates how the presented agential provotype sparks a re-evaluation of set beliefs and human-centered ontologies.

### Questioning Ontologies

The aim of the agential provotype presented in this paper is to initiate a dialectic process between ontologies. As a global society, we are deeply vested into a neoliberal ideology, which has dominated global politics since the late twentieth century. Poignantly expressed by Margaret Thatcher's slogan: "There Is No Alternative," neoliberalist ideology claims that global capitalism is inevitable and represents the only realistic system for a modern society. This ideology has become so pervasively entrenched into everyday life that it has become "easier to imagine the end of the world than it is to imagine the end of capitalism" (Fisher, 2009; Jameson, 2003). By announcing "the end of history", Francis Fukuyama, at the end of the Cold War, describes the victory of the neoliberalist West as "the end point of mankind's ideological evolution and the universalization of western liberal democracy as the final form of human government" (Fukuyama, 1989). In this post-ideological age, capitalism is presented as the natural order of things, an inevitable fact as indisputable as the evolution of species or the earth's orbit of the sun. However, neoliberalism's naturalization of values as facts is nothing but the installation of a "business ontology, in which it is simply obvious that everything in society, including healthcare and education, should be run as a business" (Fisher, 2009). Yet ontologies are not facts, they are systems of beliefs and values, which can - and should! - be challenged, especially when these beliefs are becoming increasingly violent, oppressive and destructive both socially and environmentally.

As Karen Barad clearly illustrates in *Meeting The*

*Universe Halfway*, reality is agential and defined by the apparatus through which we 'choose' to look. The apparatus is not merely a technological set-up, but signifies the entire social, epistemological and ontological framework, in which the technology is embedded. The positioning of the technology creates an 'agential cut', which determines our experience of reality (Barad, 2007). Art, and the critical and subversive branches of design can be, and frequently are, deployed as cultural apparatuses, challenging the status quo. Straddling technology, science and design practice, agential provotypes can reveal the discrepancy in the 'factual reality' of separation within which we assume to live, and the intricate relationships with entities in the world, which are intangible. This revealed, it acts as a spark to ignite questioning and re-evaluation of an ontology based on separation and exploitation, which guides and justifies violent acts against fellow kin, human as well as nonhuman.

### Agential Provotyping

Provotypes originate from systems design in the early 1990s and are used at the front-end of an innovation process to understand how people experience phenomena to which they are habituated. They are introduced to provoke and 'bring-forth' discrepancies in current practices which are not perceived as problematic, but as a point of departure and resource for change (Mogensen, 1992). The provotyping approach builds on Activity Theory, which states that instruments which mediate everyday activity, become 'invisible' or 'taken-for-granted' when in use (Engeström, 1987).

Agential provotyping, extends the idea of provotypes as design artifacts that can reveal the unconscious elements of human existence and question predominant values, beliefs and assumptions. The presented agential provotype discussed in this paper intends to foster respectful multispecies coexistence. This concept can be equally applied to other agendas.

Agential provotyping is a tool of a subversive design practice, which may initially appear to exhibit similarities to critical design. However, agential provotyping differs on several accounts in application, approach and intent:

**1) Broad appeal:** As a form of constructive design research, critical design is a critical theory approach, whereby the intention of the design becomes a medium with which to reflect on the cultural, social

and ethical impact of technology (Bardzell, Bardzell, Forlizzi, Zimmerman, & Antanitis, 2012; Dunne, 2008). The artifacts emerging from critical design are often provocative, ambiguous and foreign as a means to encourage reflection of our society in context. The artifacts produced and applied by critical designers are pregnant with meanings, assumptions and theoretical perspectives which rely on viewers' broad understanding of art, design, culture and theory of interpretation (Koskinen, Zimmerman, Binder, Redstrom, & Wensveen, 2011). Critical design thus often remains unintelligible to the broader public, who lack the visual literacy, the theoretical information and discursive backgrounds necessary for decoding the artifacts. In contrast, agential provotyping aims for appeal to a broader public and views the artifact as a means of enticement and engagement, resulting in delivering of a message, which should be readily understood. Framed as tactics of aesthetics, the design is developed to be aesthetically pleasing, inviting and, borrowing from interaction design and user experience design: user friendly.

There are several reasons for this approach:

- a) Designing for change, whether social, political or ecological, needs to be inclusive. Appealing merely to academic and artistic minorities will not have the necessary impact to successfully address current social and ecological concerns. In this regard it is the role of the designer to convey the intended message so that it is intelligible and attractive to a broader public.
- b) Pleasant experiences induce a positive emotional state, which several studies have proven to increase motivation and positively influence an array of cognitive processes, such as the processing of information, negotiations, decision-making, categorization and creative problem-solving (Erez & Isen, 2002; Isen, 1987; Konradt, Filip, & Hoffmann, 2003). Being in a positive and relaxed state of mind, renders people open-minded and willing to engage with information that otherwise could be dismissed as too odd and challenging (Norman, 2005).
- c) The key to change is to cultivate empathic behavior and thought, that can comprehend the intricate entanglements of the myriad relationships which make

up the life-sustaining forces on our planet (Rifkin, 2009). Taking utmost care not to alienate the audience in the process is hereby of paramount importance. Most activist practices rely on campaigns, which call for subtractive actions, i.e. restriction, reduction and prohibition. These campaigns have failed to engage with sections of the general public, who often perceive them as condescending and lecturing. The large number of 'climate skeptics' and the constantly increasing consumption of resources and emissions of green house gasses illustrate this. Agential provotyping takes a different approach by providing additive experiences and so enlarge and enrich the life-world of the engaging audience.

**2) Agent of change:** agential provotyping is not a critique of design practice, but applies design as an agent of change. Agential provotyping is a form of application and is as such not limited to any particular part of design practice but will use whichever approach, tool, technology and medium appropriate in a given context.

### The Flora Luma Installation

The agential provotype Flora Luma was developed as an interactive installation for use in public space. Flora Luma was inspired by the remarkable research emerging from botanical studies, revealing plants to be more aware of their environment than previously assumed. Plants are highly sentient (Karban, 2015), they recognize kin and adjust their behavior accordingly (Dudley, Murphy, File, & Robinson, 2013); they communicate with other plants as well as with animals (Karban, 2015); they actively optimize their living conditions (Brenner et al., 2006); they learn and remember past experience (Gagliano, Renton, Depczynski, & Mancuso, 2014). They also communicate and share nutrients via subterranean mycorrhizal networks, also referred to as the 'wood-wide-web', within their communal population (Helgason, Daniell, Husband, Fitter & Young, 1998).

The installation comprises 3 objects, fashioned from self-illuminating hand-woven fabric made from fiber-optics and cotton (Fig. 1.). The color of the fabric is controlled by a programmable micro-controller. Each object is connected to a plant with an electromyography (EMG) sensor which measures the electrical activity of the plant. The data collected from the plants depend on

abiotic environmental factors, for example temperature, luminosity, humidity and seasonality. Haptic stimulations are also of major importance. Each object runs a simple repeated loop from red through green to blue and back to red. Due to the positioning of the attached LEDs the colors blend inside the fabric, creating a wide and nuanced coloring ( Fig. 2.-3.).The color changes are controlled by the intrinsic state of the plants, as measured by the EMG sensor, i.e. the velocity of the color-change and the color emitted depends on the internal electrical activity of the plants. Due to the plants'



Figure 1. The Flora Luma installation. ©Author.

sensibility to haptic stimulation, touching it provokes a rapid and striking reaction, so that an interactant can influence the visual output of the luminous objects in conjunction with the plant and elicit immediate visual feedback of the interaction (Fig. 4.). The emerging stories, mediated and facilitated by the artifact, are reminiscent of ancient tales and fables, which recognize the animate nature of all living beings, in addition to the deeply entangled nature of the relationships between humans and nonhumans which is still informing First Nations' non-anthropocentric ontologies, in an experiential, subjective perspective.

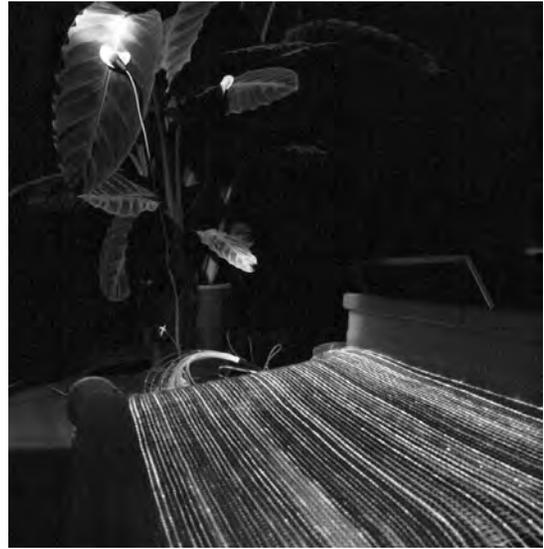


Figure 2. Self-illuminating fabric on the loom. Plant with attached EMG sensor in the background. ©Author.

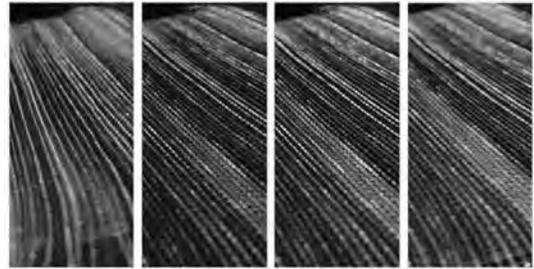


Figure 3. Red to green colour change. @ Author.

### Agential Provotyping in Public Space

The installation was exhibited at the Luminale16 in Frankfurt, Germany (Fig. 5.0 - 6.1), which took place every evening over a period of five days in March 2016. The Luminale is a biannual event, a 'Festival of Light', which takes place in conjunction with the Light + Building Fair, biggest of it's kind, worldwide. It has approximately 200 light-events scattered around the city and attracts around 200.000 people. The patrons are a heterogeneous assemblage of Germans, the majority being locals from Frankfurt and the surrounding areas, and internationals of all ages, genders and professional backgrounds, who

come specifically to experience the Luminale.

The Flora Luma exhibit was situated in Nizza Park, a quiet and lush area on the bank of the river Main. The trees and shrubs fitted the ethereal quality of the installation perfectly and stood in stark contrast to the intense and high powered activity of the busy city streets, many displaying multistoried, big budget installations sponsored by major corporations.

We intended to conduct a number of interviews over the course of the event but the large aggregation of people who were permanently present at the site, held us so deeply and continuously engaged in conversation, that the opportunity for interviews were limited to a few hours on one less busy evening. We therefore adjusted our approach to a few semi-structured interviews, which were recorded and later transcribed. These interviews together with our observations from conversations with the groups of 20-40 perpetually changing visitors at each of the three objects, taking place over a period of several hours each evening and supported by observations of their behavior, and conversations between the visitors themselves, provide the basis of the presented outcome.

In spite of the somewhat hidden location the installation received a lot of attention. We did not have the means to monitor the number of visitors but an educated estimation would be that of several thousand people over the course of the event, comprised of 50 % local residents, 25% Germans from out of town and another 25% international visitors.

Intrigued by the ethereal quality of the installation, often described as reminiscent of fen lights, the movie 'Avatar' or bioluminescent aquatic life-forms, visitors would spend a prolonged time examining the objects and observing the patterns of changing colors. Eventually, on discovering the sensor pads and wires connecting each object to the adjoining plant; they would enquire about the purpose of the apparatus. We would then explain the underlying science and technology of the complete installation, to visitors amazement and occasional disbelief. Dispelling doubts was generally achieved by a blend of demonstration and authority



Figure 4. Project sketch. ©Author.

**1) Demonstration:** Touching the leaves of the plant causes an immediate response, an action potential in the plant. This response is instantly reflected in the appearance of the luminous object, allowing visitors to directly engage and interact with the plant, receiving immediate visual feedback.



Figure 5.0 Installation site at the Luminale. Photo 1. ©Author.



Figure 5.1 Installation site at the Luminale. Photo 2. ©Author.



Figure 5.2 Installation site at the Luminale. Photo 3. ©Author.



Figure 6.0. The Flora Luma artifact. Close - up 1. ©Author.



Figure 6.1. The Flora Luma artifact. Close - up 2. ©Author.

**2) Authority:** An important factor for the credibility of the installation was the conveyance of the corresponding science and underlying technology. It was of importance to communicate using terminology of language to a layman audience, whilst at the same time project scientific confidence, i.e. having the ability to refer to publications and studies for verification of a thorough understanding of the subject-matter by the presenter.

Visitor responses were very positive; many stayed for extended periods, interacting with the plants and engaging in conversations about the perceptive and responsive capabilities of plants with us, the researcher-designers, and amongst each other. For many the installations provided a highlight to the event, as one of the interviewees noted: “At first we just came for the beauty of it. It’s a very otherworldly scene, with the delicate lights under the trees, but now that I know what lies behind it, it is absolutely phenomenal, much better than those lit-up high-rises”. Another remarked: “This is our first evening at the Luminale and we have been walking around for two hours now and this is beyond comparison the most interesting thing so far” As the event progressed through the week we noted that some visitors approached the installation resolutely, moving directly to examine and interact with the plants. They then sought us out with questions. We discovered these new visitors had been urged to investigate the installation by previous visitors to the site.

### Reflections

Engaging with the installation provided a challenge to visitors’ assumptions of the vegetal environment, where plants are seen as passive automatons simply carrying

out a genetic program. Discovering plants as sentient beings through a first-hand experience provoked visitors to reappraise their perception of their life-world.

One visitor remarked: “It’s incredibly interesting. I’m kind of a little bit of a science person and I’ve never heard of anything like it. I’ve never before heard that signals from plants are studied. It is completely new to me and it is apparent [from the installation], that there is even feedback from the plants. I will have to go home and read up about it.”.

Interacting with the agential provotype allowed the visitors to experience a hidden phenomenon and exposed them to a concealed discrepancy in their existing ontology – zoo-centrism, i.e. that only animals have sentience and awareness, and are responsive to their environment.

Evident from repeat visitors, it appeared that this experience, in several instances served to catalyze a development of increased empathy, as one visitor expressed: “It makes me think about how negligibly one moves about in nature and not thinking about what kind of signals a plant sends, I mean that she can signal anything at all. Mowing the lawn, hacking down flowers, without any thought about what a plant perceives or what that flower is capable of doing, after all, it’s just a flower, I’ll just tear it off”.

The aesthetic quality of the exhibit served as an entry-point for the visitors, and facilitated the transfer of challenging academic niche-knowledge gaining a considerable amount of interest and traction. Visitors experienced the interaction and the ensuing conversations sparked by the installation as providing them with an expansion to their life-world, and not as lecturing or moralizing. Numerous visitors remarked that the installation constituted a definite highlight to the event due to its accessibility and revealing second layer of information, beyond its visual display. Their perceptions were that, whereas the other installations were aesthetically appealing, they were predominantly visual spectacles.

### Conclusion

The goal of this paper has been to present evidence that the notion of provotyping, if applied agentially in public, ensures the creation of awareness in a broad and heterogeneous audience of the obscure relationships that exist within our life-world; this being in general, knowledge recognized by a select,

perhaps exclusive group within academia.

The paper presented an agential provotype which facilitates reciprocal encounters between human and vegetal interactants, to expose plants as being sentient. Plants, a vital life-sustaining force on our planet, are historically overlooked and underappreciated. The installation reveals the perceptive and responsive nature of vegetal life and thereby questions the present human-centric ontologies in a tangible and accessible way to a wide- ranging audience. The discussed encounters with the agential provotype installation herein, demonstrated its ability to foster empathy towards plants and it is therefore anticipated, to engender caring and respectful behavior towards vegetal life in the visitors’ futures. In this way the encounter with the agential provotype hints at the potential ability of the layman to accept a reality in accordance with First World Nations’ ontologies, which recognize the animate nature of all beings in addition to the deeply entangled symbiotic relationships between humans and nonhumans.

Due to the brief interaction with the visitors to the installation it is not possible to determine whether the experience, facilitated by the agential provotype, actually resulted in any long-term behavioral changes. It would be beneficial to implement studies of longer duration, utilizing permanently deployed agential provotypes, to acquire information of the long-term impact on the local citizenry encountering the installation; including a devised method of engaging visitors in a follow-up study. However, we could clearly observe that the agential provotype installation facilitated a profound attitude improvement at the installation itself and initiated both curiosity and a willingness to learn in the engaging visitors.

### Acknowledgements

The presented installation Flora Luma was created with Maggie Kitel as the art&design collective lucie, [www.lucie.design](http://www.lucie.design).

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### **Author Biography**

Raune Frankjaer holds a Masters degree in Spatial Interaction Design and is currently a doctoral candidate at the Department of Digital Design and Information Studies at Aarhus University, Denmark. Her research centers around non-anthropocentric applications of information and communication technologies, with a particular focus on interactive artifacts and haptic and wearable interfaces.