

# Iterating through Feeling-with Nonhuman Things

Exploring repertoires for design iteration in more-than-human design

Armi Behzad  
School of Interactive Arts and  
Technology, Simon Fraser University

Ron Wakkary  
School of Interactive Arts and  
Technology, Simon Fraser University,  
and Industrial Design, Eindhoven  
University of Technology

Doenja Oogjes  
School of Interactive Arts and  
Technology, Simon Fraser University

Ce Zhong  
School of Interactive Arts and  
Technology, Simon Fraser University

Henry Lin  
School of Interactive Arts and  
Technology, Simon Fraser University

## ABSTRACT

In this paper, we explore the notion of sympathy in the context of more-than-human design to include nonhuman participation in a design iteration process in an ongoing project named the Morse Things. We explore ways in which nonhuman agency, particularly breakage, can participate in an assembly of human and nonhuman designers. Motivated by Ron Wakkary's theory of *designing-with* and the concept of *repertoires*, we propose *feeling-with* as a potential repertoire for increasing nonhuman participation before, during, and after the design process. Finally, we explore four instances of sympathy and how breakage as a nonhuman force can lead us to new design iterations to redesign the new set of Morse Things.

## CCS CONCEPTS

• **Human-centered computing** → Interaction design; Interaction design theory, concepts and paradigms.

## KEYWORDS

Designing-with, Feeling-with, Repertoires, Sympathy, Research through design, Breakage, Gothic ontology, More-than-human design, Posthuman design

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## 1 INTRODUCTION

Design iteration is an essential part of any design-oriented HCI research and practice. Commonly, determining factors in iterative processes may include designer choices, user feedback, material

or contextual properties. As HCI has taken on its fourth wave [5]—turning away from human-centered design to engaging with posthuman theories [1, 3, 6–8]—it has inspired design researchers to rethink and develop new understandings of human and nonhuman relations in more-than-human design processes. In our own design research, we have turned to Wakkary's *designing-with* [17], a posthuman theoretical approach for attending to nonhuman participants in the design and the making of things that seeks a relational and expansive design based on humility and more-than-human cohabitation. In this approach, a human designer attends to the broad network of humans and nonhumans related to a design project, what Wakkary calls a *constituency* [17] of humans and nonhumans. This concept refers to the act of gathering all that participate, including non-speaking nonhumans, in the design and making process. A constituency and a design project are mobilized through *repertoires* [17]: methods and techniques in which nonhumans can become participants in creative design processes. Wakkary and others [12, 17] have looked at how repertoires can be shaped and put into practice by utilizing related theories and practices that are more-than-human in their pursuits. In this work-in-progress paper, we explore how Lars Spuybroek's notions of *sympathy of things* [14] can inform the development of a repertoire we call *feeling-with*. Specifically, we explore in this paper how through feeling-with, nonhuman agencies can participate and even lead the iteration of a design project called the Morse Things [16].

In this late-breaking work, we present our work-in-progress with feeling-with, a potential design repertoire, as an approach to iteration. We take a relational approach by utilizing Spuybroek's notion of sympathy [14], to reorient ourselves within the constituency and give way to the nonhuman members. By shifting agency from the human designer to nonhuman participants, we investigate new ways nonhumans can lead and generate new design iteration trajectories through sympathetic relations. We further contribute to design practices around repair [9, 11], bricolage [15], and fragmentation [10], previously established within HCI. In the following sections, we give a background on the Morse Things and sympathy of things, explain our design constituency, and present four sympathetic instances as part of our feeling-with repertoire. We conclude with reflections on our process, potential research questions, and future steps.

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**Figure 1: Left: Original Morse Things, right: Broken Morse Things**

## 2 BACKGROUND ON MORSE THINGS

Morse Things has been an ongoing project at the Everyday Design Studio since 2016. It explores what it means to be a thing on the internet while being part of our everyday human experiences. Morse Things are a set of ceramic cups and bowls connecting to the internet and communicating via Morse Code [16]. Through a material speculation approach, the project is motivated by philosophy of technology and thing perspective in HCI to investigate and inquire about the gap between things and humans. After a lapse of a year or more we developed a new iteration of the Morse Things and planned a second deployment study (see [13] for details). However, the second deployment was cut short after the Morse Things broke during shipping to and from study participants (figure1). After exploring repairs or refabrication of the ceramic bowls we decided to launch into a new phase for the Morse Things in which we aimed to work in partner with the agency of the broken pieces. We were excited at the opportunity to explore iteration and nonhuman agencies from a starting point of breakage or repair. This meant a reconceptualizing of our human assumptions to fully attend to breakage as a sign of nonhuman forces. Therefore, in this phase, we see the broken pieces as active members with agentic capacities [4], potentially generating design alternatives and iterations as to redesign the broken Morse Things. Our aim is to reorient ourselves within this collaborative space and actively decenter our human agency to make way for the broken Morse Things and their agentic capacities as nonhuman designers. To that end, we embrace designing-with nonhumans within the constituency while acting from a position of indeterminacy and not-knowing, making way for a more inclusive partnership to emerge.

## 3 SYMPATHY OF THINGS

Sympathy goes hand in hand with Spuybroek’s theory of Gothic ontology in that it explains what things feel when they shape each other. Spuybroek’s gothic ontology, based on Gothic architecture, reveals the relationalities, entanglements, and ultimately the sympathy between things. He describes Gothic ontology as “a special relationship between figures and configurations, in which the figures are active parts that have a certain freedom to act, though

only in relation to others and in order to form collaborative entities” [14:xvii]. It is a type of flat ontology that understands existence as an interaction between things allowing them to constantly become or change. A flat ontology refers to the idea that all entities have the same degree of being without any hierarchy and are relationally heterogenous. Gothic ontology is concerned with internal relations that exceed combinational forces and “interpenetrate because they are connected by feeling” [14:137]. Things share an internal plane referring to felt abstraction, much like how a glass shares an internal plane with a table, where the formative relation only exists internally, and it then forms a relation that is one of sympathy. Sympathy can be explained “as much a feeling as a form of thinking, but one that is especially present in aesthetics, meaning it specifically acknowledges a mental, but not psychological, and a bodily, though not sensual, reciprocity between us and things” [14:108]. Spuybroek describes sympathy in two ways: First, it is the relation between elements that make things and/or are inherent to the object. For instance, the ribs in gothic architecture are sympathetic while moving across and through each other that constantly build and unbuild forms and patterns. Second, sympathy shapes when the human looks at the thing and feels sympathy with it. Spuybroek also refers to philosopher Henri Bergson to elaborate on sympathy as “a form of feeling-knowing operating in the interior of things” [14:118] that is internal by feeling rather than thought. Bergson also uses the relation between a wasp’s attempt at paralyzing a caterpillar by finding the right contact points to sting and paralyze as an example to illustrate his definition of sympathy. Spuybroek builds on Bergson and articulates how sympathy dwells within things that are *always in the making*, meaning that the reconfiguration of a thing goes beyond seeing, as the thing is constantly going somewhere indeterminant. By engaging with matters of time, movement, force, and activity, this active becoming [2] takes form within an exploratory space of feeling as they shape and reshape each other.

Within our exploration, we draw on sympathy as a way to destabilize our assumption as the human designers and see ourselves on the same level in the assembly with the broken Morse Things. We want to internalize the flatness between various components

involved in the design process and their relational configuration to reconceptualize the new Morse Things iteration process. We further aim to attend to the internal relations between each broken fragment through sympathy to understand the continuation of the old Morse Things and the ones we set to design.

#### 4 THE CONSTITUENCY: THE GATHERING OF HUMANS AND NONHUMANS

Throughout our exploration, we shape, experience, and develop the notion of sympathy through *feeling-with* repertoire within the constituency, which we form with human designers and nonhuman things. In our attempt at redesigning the broken Morse Things, we first identify the constituency by bringing together what is familiar and known to us from the original Morse Things. This involves people who are members of the Morse Things research team, and nonhuman members such as the Everyday Design Studio as the site of origin, the broken Morse Things which included broken ceramics, kintsugi repairs, battery, circuit board, speaker, machine learning algorithm, morse code, color pigments, Sugru glue, Morse Things time zone, packaging, and shipping.

We later invite things that we may have overlooked or along the way become important, such as virtual collaboration spaces like Miro, which was our primary ideation and discussion space as part of our constituency due to the pandemic. Other members, such as food choices, namely pasta and ramen, and their eating practices enter the constituency as we start to notice the potential sympathies between the bowls we were making and what they may contain. In taking our later steps in the process, sketchbooks, CAD modeling software, strings for measuring purposes, and 3D scanning apps and machines also arrived at the gathering. This gradual growth occurs throughout our research process as we continue expanding our constituency and form sympathetic relations to things within and outside this gathering.

#### 5 INSTANCES OF SYMPATHY: CO-SHAPING THE FEELING-WITH REPERTOIRE

In this section, we present and reflect on four sympathetic instances that emerged from our constituency as we develop a feeling-with repertoire in exploring iterative design directions led by nonhuman members.

##### 5.1 Continuation and movement

Per Spuybroek, continuation and ongoingness establish sympathetic relations within and between things. In such relations, continuity exists only to create discontinuity, meaning that it allows for a new collaboration to begin at the cost of ending the one it is currently part of. Following this notion, we account for elements from the original Morse Things to bring in new ones while we destabilize our assumptions from their prior role and allow for them to prompt us into finding new connections, onboarding instances, and potential sympathies between the old and new designs. As such, we explore sympathies that may allude to the Morse Things familial relations, temporal stories, and visual cues, continuing their paths from the past as they stretch and take up their new role. We follow movements in which the kintsugi lines—created as part of a repair phase—can take the form of indentations, revealing patterns inside

the bowl as the food is consumed, or how each bowl passes on its color by creating gradients onto the new set, or how the new Morse Things are onboarded through an authentication process using the original machine learning, or how the inner shell of a bowl can form a swelling to nest a cup for stacking purposes during packaging (figure 2).

##### 5.2 Contact points of the inner and outer shells

Returning to Bergson's example of the wasp and caterpillar, we explore what co-constitutes contact points in relation to the original and our iterations. We bring together previous iterations of the cups and bowls and experiment with nesting them within one another. Each original Morse Things consists of an inner and outer shell, which encapsulate the electronics in between. We further explore contact points by altering shells among all variations. In coming together and forming sympathies, the contact points revealed pockets for embedding the electronics, created new indentations, and formed new sympathy lines (figure 3).

##### 5.3 Tracery and tracing of breakage lines

In gothic architecture, tracery is generally understood as a characteristic found in rose windows and wooden lattice framings. It is concerned with line drawings either drawn by the architect on paper or carved out from wood or stone by the workman. Either way, the drawn lines transform from their original variation to another as they embody new materials, forces, and temporalities. Such variations are inherent to gothic ontology, following lines from one angle to another and forming ongoing sympathies as they perpetrate from one variation to another. We borrow this concept and explore the changefulness of the broken Morse Things as we attempt to feel-with the breakage lines created during shipping. We also follow the kintsugi line made of gold that was tastefully placed between the halves of a broken cup when we sent it to Japan to mend as it broke during the first deployment. To that end, we use photos of the broken cups and bowls to trace and follow the breakage lines. We explore breakage line variations in volumetric forms in 3D models, which creates new sympathies between the broken patterns. While experimenting with different breakage lines, the overall forms in each model produce a sympathetic relation to one another as well (figure 4).

##### 5.4 Figure configuration of broken pieces

Spuybroek explains how in gothic structures, “figures are active not for themselves but because they want to find each other” [14:11] and contain various forms of movement. From a gothic ontology point of view, figures are never static or complete as a finished structure. Instead, they are always moving and reconfiguring themselves from one stretch of an arch to an ornamental form on a column. Spuybroek elaborates how in relation to figure configurations, “a thing cannot simply scale up (by continuity), it needs to break up and reorganize continuity into segments” [14:14]. Therefore, elements must be liberated from folds to collaborate with other elements as they disengage from one assembly and enter into another.

The broken Morse Things express a similar notion by disembodiment from their original unbroken state to embracing their broken companions and inviting them to form new alliances as they create

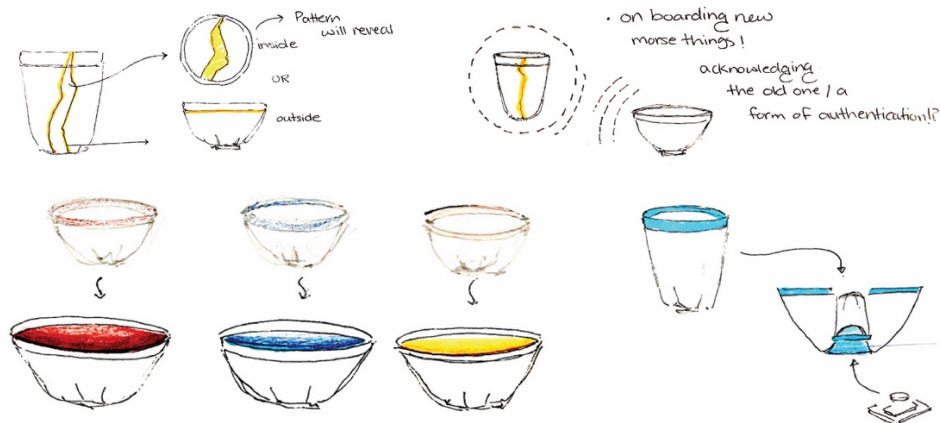


Figure 2: Exploring sympathies through continuation and movement



Figure 3: Exploring sympathies through contact points

new configurations. As the broken pieces are part of a larger scale formation, we explore how breaking up the existing configurations of each broken bowl leads us to new gatherings and new forms. Our interpretations and abstraction of the fragments guide us to use the principles of folded geometry, such as those used for making clay bowls to fold and unfold each new gathering (figure 5). In doing so, we become more attuned to each individual fragment and its unique shape and size. We actively listen to each piece by tracing and sorting them one by one, much like how archeologists carefully listen to the call of unearthed pieces while reworking their configuration. Resonating with Spuybroek's notion of always in the making, the pieces reveal an active becoming, reaching out to connect to other broken parts from bowls that they did not originally belong to. Through this process, pieces form new sympathies within and between each other that we could not have recognized otherwise. This internal feeling existing within and between the

pieces extends as compositional variation and reconfiguration of each fragment. As fragments find their way next to another to form new collaborations, we find new understandings for how the nonhuman agency can participate in designing-with us and with each other.

To summarize, the repertoire of feeling-with enables nonhuman designers to take part, lead, and generate new design iterations in the process of making, as they find sympathy within and between one another. Through the presented instances, we contribute four avenues for partnership with nonhuman participants as they suggest potential design iterative directions:

- *Continuation and movement*: nonhumans disengage with old sympathies and enter into new ones by exploring relations between all the members (human and nonhuman) that originate from a previous design iteration to reveal new relations.



Figure 4: Exploring sympathies through tracery and tracing the breakage lines. Left: tracing the kintsugi lines, right: using traced lines and creating volumetric forms.

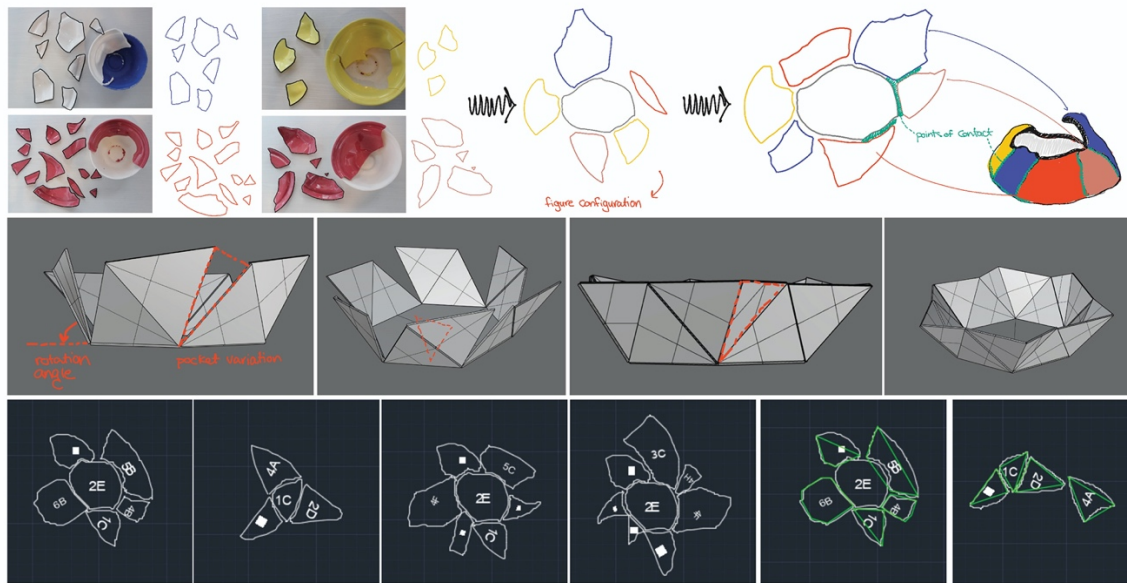


Figure 5: Exploring sympathies through figure configuration. Top: tracing broken pieces and broken configuration, middle: configurations and abstraction, bottom: unfolding and folding.

- *Contact points*: experimenting with nesting prior design iteration of bowls and alternating their shells to arrive at new ones for housing the electronics.
- *Tracery*: Following broken lines and attending to their call as they move across one bowl to another and transition from two dimensions into three-dimension.

- *Figure configuration*: attending to each broken piece and following intently the emerging sympathies within and between pieces as they find sympathy through their size, rough, and smooth edges.

## 6 REFLECTION AND FUTURE WORK

Reflecting on our explorations, we recognize a similar thread between the internal felt relations to research such as material breakdown, use, and repair, where design researchers particularly engage

with broken artifacts as material agents or active participants in the design process [9, 11]. Additionally, we see an interesting connection between bricolage— “an alternative path expanding how we see and use technology” [15:173]— and our feel-with framework. Much like how the bricoleur is responsible for working with what is at hand and structuring events that can come before or during the design process, through feeling-with, we reconstruct and reconfigure the materials to explore the opportunities and limits of the broken Morse Things as the nonhuman agencies lead the iteration process. In relation to material fabrication tactics such as breaking, combining, and repurposing materials found in fragmentation practices [10], our feeling-with approach supports the constant process of death and rebirth and loss and renewal of materials as the broken pieces generate new iterations through forming sympathetic relations with each other.

Our early explorations have helped us better understand the role of nonhuman agencies as partners within the design process and how designing-with them can generate new ways for nonhuman design iteration through sympathy within and in between humans and nonhumans. We distinguish the levels of generative force that each instance brought to the feeling-with repertoire. For example, figure configuration provided a more decadent generative and creative space for a variety of iterations compared to contact points. This prompts us to ask in what ways can we increase the generative space within each sympathetic instance? What will a combination of instances look like? When is the right time to gather and break up sympathies within a nonhuman iteration process? What new nonhuman temporalities will we need to account for in a nonhuman design iteration? How might feeling-with help us think differently about sustainability and repair practices? And how might sympathetic instances carry through after the design process is complete? With such questions in mind, we will continue our nonhuman exploration of iterations and open our constituency to other humans and nonhumans to explore other sympathetic instances for amplifying nonhuman participation.

Through our feeling-with approach, we see further opportunities to explore thought-provoking moments which we came across during our iteration process. For example, in reconfiguring the broken pieces and attempting to fold and unfold the new layouts, the Morse Things were constantly in the process of becoming and changing. The shifts from the original form to variations of its new state reminded us of how the replacement and restructuring of pieces are like the ship of Theseus thought experiment that challenges an object’s originality if all its parts were exchanged. We ask whether a reconfigured Morse Things, with all its components displaced or partly replaced, remains fundamentally a Morse Things within our broader research scope? This opens a new space for further exploration of other design examples from our own studio, such as a customized machine that also broke during its transportation from the Netherlands. Moving forward, we continue to form new entanglements with nonhumans within our constituencies to increase frictions and opportunities for new challenges to emerge. In doing so, we hope to keep our collaborative space with nonhuman designers open and expanding, making way for similar repertoires to emerge as we follow nonhumans in our design iterations.

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