

Speculative Design: Creative Possibilities and Critical Reflection

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Abstract

Speculative design is an emerging practice-based research methodology that promotes designed objects as tools for critical reflection. It serves as an alternative to existing strategies by channeling research findings through symbolic material objects. Rather than being represented as situated consumer products intended for mass production, these forms live in exhibition and publication environments. As a result they express knowledge as symbolic information through form and interaction as opposed to a more sequence dependent linear reporting. The interaction and experience one has with speculative objects are used to initiate further design—generating an iterative design practice that reflects upon cultural realities by elevating the significance of formal and interactive elements.

INTRODUCTION

A presentation of form as research has the advantage of implementing all the resources afforded to material objects such as imagery, sound, tactility, presence, feedback, interaction, duration, and behavior. Utilizing this wealth of information embedded in the vocabulary of our physical world as ways to represent ideas and cultural understanding can contribute significantly to the different ways research can be translated. If the power of this versatility can be harnessed in research objects, they can fulfill potential that is otherwise limited by using only words and numbers

The speculative design process doesn't necessarily define a specific problem to solve, but establishes a provocative starting point from which a design process emerges. The result is an evolution of fluctuating iteration and reflection using designed objects to provoke questions and stimulate discussion in academic and research settings. The interpretation of these objects results in a practice of critical design that can be receptive to a diverse audience, an open-minded approach to what constitutes knowledge and the symbolic forms it can take.

Evidence of the possibilities within speculative design is articulated in a body of work comprised of three projects. Each project approaches the methodology from a particular perspective and investigates various conceptual strategies. Together they communicate a range of possible outcomes and are realizations of the diversity inspired by practice-based research.

SPECULATION 1: CONSTRUCTION AS RESEARCH

The goals of this initial project were to create form situated in the context of a critical studio environment to investigate broad areas of interest. It served as a particular example within the speculative design process, providing an alternate direction to later more defined context-dependent models. In this project the act of construction and reflecting became a means of exploration and investigation, implementing an iterative process of making and writing simultaneously. It used form building as a means of analysis and discovery by thinking and acquiring knowledge through one's method of construction.

The process involved making abstract structures as conceptual visualizations that lead to new insights and questions—what constituted the research outcomes. Furthermore it served as an avenue to experiment purely formally to see how structural elements may influence the aesthetic decisions in future design projects. Building became a strategy, an entry point, and a material exploration that attempted to establish a

vocabulary and the ability to start to articulate ideas. By exposing questions and thoughts that were raised during the process of making sculptural forms, curiosity became a foundation to build upon.



Each model was accompanied by written reflections articulated both during and after the construction process.

SPECULATION 2: AUTONOMOUS LIGHT AIR VESSELS (ALAVs) 1.0

The ALAVs 1.0 project was a collaborative initiative that brought the speculative design process out of isolation and into a public realm. Evaluating the project from a research perspective, it was a public performance model that resulted in creating objects that behave and respond in specific ways. The objects were designed to expose the creative potential of working with emerging network technology. The system provided an open-ended experiential environment that a diverse audience could develop an emotional engagement with. It became an avenue for people to respond to unfamiliar material by using familiar vocabulary.

The ALAVs are flying objects that integrate technology into working objects in an airborne space. They exist in a networked system and communicate through assigned scenario-specific behaviors that emphasize autonomous and flocking behavior. Rather than proposing a purely conceptual incentive to anticipate near future prototypes, the ALAVs are functioning objects. They are aware of their surroundings and respond to each other and to people. The ALAVs are autonomous with respect to their decision-making process, but also reference collective flocking behavior to visualize and communicate the concept of unpredictability in object-based network environments. These parameters arose as a result of the possibilities of the provided technology. The technical constraints were not perceived as a disadvantage, but were periodically addressed and translated into novel conceptual reinterpretations.



ALAVs are three flying objects that exist in a networked environment and communicate through assigned behaviors forming three scenarios: ALAVs alone: autonomous, ALAV with other ALAVs: flocking, and ALAVs with people: feeding. They are autonomous with respect to their decision making process and have an algorithm that defines how they roam in search of people or food (left). Within close proximity the ALAVs recognize another's presence and commence a flocking behavior. The behavior consists of ALAVs spinning together and calling back and fourth between each other (middle). The ALAVs interact with people by metaphorically feeding from a food device. If they are hungry they will respond when approached and begin a feeding behavior (right).

The creative process behind the project was a unique approach to research that involved the designing of technologies into working objects. Using unpredictably as an advantage, it served as a guide and learning tool. The ALAV system raises questions and issues regarding the integration of networked technology into various aspects of our everyday lives—for example a toy that can respond to, adapt, and evolve with

our daily routines. The ALAVs bring the capabilities of this emerging technology to life in a form that is accessible to a public audience. Since everyone draws different associations from their own interactions, it becomes valuable to further a discussion of possible applications by designing a system that a diverse audience—from engineers to children—could respond to. The ALAVs project provided a platform and vocabulary to encourage continuing research into how future interpretations can represent the creative potential of object-based network technology.

SPECULATION 3: MATERIAL INTERFACES FOR PLAYFUL DISCOVERY

The third project engages a speculative design process in two objects that combine interactive symbolic form with articulated content creation. The objects are content driven designs that investigate the increasing complexity and democratization of information sources. Questioning how we can interact with and experience information networks by sorting relevance but preserving a sense of discovery. They are research objects by being modes of discovery, non-linear interfaces for play and delight that navigate a parallel world—making virtual spaces physical. The objects become exploratory interfaces that expose how different affordances to discover arise with emerging technology.

A Speculative Listening Experience

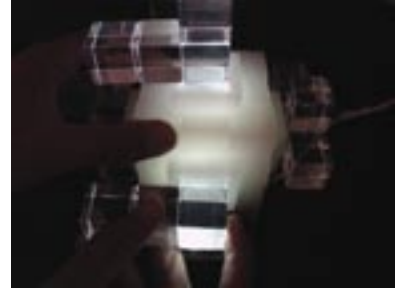
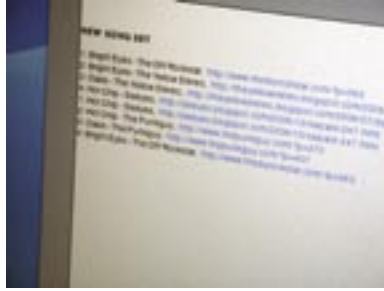
The first example is a music player that questions what a listening experience can be by translating information from mp3 music blogs. It is a formal response to new music infrastructures—a model that uses hand manipulation (object-based browsing) to symbolize associative links between songs from music blogs. An emergent aggregation of blogs and music is determined by physical construction and interactive play with an object. The designed form strived to provide an innovative alternative into how we can experience music. It questioned what that interaction can feel like by rejecting accepted conventions and promoting tactile interactive alternatives.



The Interactive object constructs associative music sequences by finding and playing songs from online blogs. The object consists of external pieces that fit into a central shape (left). Each external piece symbolically represents a song from a music blog. This is determined by its orientation when constructing the model (middle). They are programmed in real time to find and play the next song based on the previous song following these associative combinations: when positioned up: same artist same blog, when positioned left: same artist d□



When the top piece is fit into the model, it turns on and begins to play by finding and announcing a random song from a blog (left). Removing the top piece turns the music off. The music sequence then cycles through songs based on how the model is constructed, following associative properties of the external pieces (middle, right).

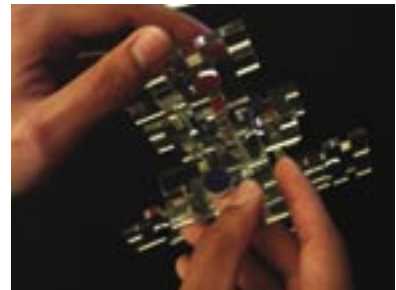
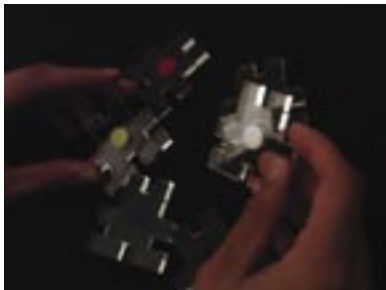


The model is linked to the web and launches the blog for the current song in new browser tabs (left). A dynamic play list with links is also created that logs the music sequence (middle). The model can function passively but also responds to direct manipulation. When playing a song, an external piece can be removed and the music is paused. If it is put back in a different orientation, the music resumes by finding a different song based on the new position's song blog combination (right).

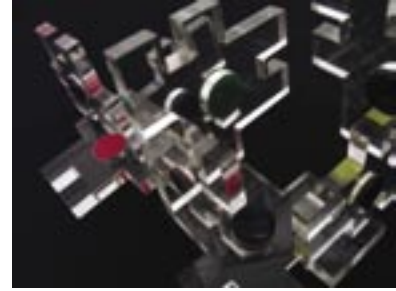
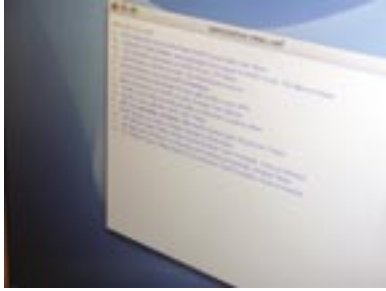
The prevalence of blogging culture serves as an example of the abundance of penetrating information networks and the democracy in their proliferation. Blogs give authority to the individual and they can establish themselves as sources of knowledge. In this particular case, the design object used sound as a means of expression to translate information from music blogs and question how a speculative radio could behave in response to this virtual content. With the ubiquity of dynamic digital music and the speed at which it can be created, broadcast, and assimilated, speculative design can illuminate how emerging technology may promote alternate ways to experience and discover music.

A Speculative News Browsing

The second example uses construction with physical shapes to symbolically represent relationships between online news articles. It shows how we can navigate online content with playful mechanical connections and re-arranging modular forms. A curated journey through virtual material can be initiated and represented aesthetically by a constructed object.



In this project a collection of physical pieces fit together to visualize browsing online news articles. The pieces are modular building blocks that can be used to construct a physical form. When connected to each other, every individual shape symbolically searches and finds articles. This works through links based on the connection to a previous piece. These associations are determined by color: white initiates sequence with a selected topic, red finds the next article from a different country, blue finds the next article with a different language, yellow finds an article with the topic appearing in the headline, green finds an article with an earlier date, black ends the sequence (left). RFID technology is used to realize this associative browsing. Each piece had a unique RFID tag that is scanned (middle) as the model is being constructed (right).



There is also a real time generation of links to articles (left). This log is driven by how the model is being constructed. After the last piece is added, a series of articles are launched in a browser (middle). This is determined by the order and connections between the pieces in the model (right).

In our current global information environment we have the ability to access culturally sensitive news from all around the world and move to distance ourselves from provincial biases. Again emerging object-based technology can inspire innovative entry points and means for discovery within this overwhelming virtual space. By using a formal vocabulary of modular construction that correlates with parallel virtual connections, information browsing is visualized from a different perspective—represented aesthetically by a constructed form. We can navigate a curated journey through online material and discover places that we may otherwise have not known to exist by building physical objects.

Providing Content

The content is an essential component in these forms since it gives an audience a comparative point of reference that enhances the comprehension of the overall conceptual framework. In this case, there is a correlation between the symbolic characteristics of the objects and the content driven context they investigate. The speculative objects adopted existing online culture and web based content to demonstrate alternate ways to interact with dynamic virtual information—commenting on innovation and new ideas. The goals of this project lay in the communication of new modes of interaction by combining familiar content with specific applicable real world environments.

For these forms to function as research objects and tools for knowledge, they need be curious and provocative but also give people means to understand how they function. It is significant to emphasize that their role isn't contingent upon finding the most efficient or practical way to access information, but uses emerging technology to question what an entry point for playful discovery can be. Despite the prevalence of searching for information in modern Internet culture, the network intelligence in these two speculative objects was not designed to be goal oriented. They use material play and hand manipulation to channel serendipitous browsing. Instead of more accepted conventions such as clicking, these forms use an object based browsing to navigate a parallel virtual world. They are experimental tools that stimulate thinking by providing a tangible object to respond to.

Creative Process and Points of Inspiration

The designed outcomes were the results of a structured creative methodology that involved defining a context to explore and incorporating ideas that approached that context from a different perspective. This process provided a starting point from which the content and research objects were conceived. The following is an overview of that process-driven methodology.

The first step was to establish a context to investigate and develop a set of situated questions to initiate a design process. These questions were posed to better understand a given context by providing a specific area to design for. The resulting design outcomes would manifest as conceptual responses to these questions. In this particular design research initiative, the context was a response to how we experience dynamic information environments. We are entrenched in such a wealth of information and are constantly being introduced to tools that enable us to access more information. However how can emerging technology expose alternative strategies to penetrate this saturation of expanding virtual space? The next step was to consider how speculative objects could align themselves with these questions, illuminate a range of

potential, generate unusual and provocative outcomes, and provide potential answers. In an effort to fulfill these criteria and inspire creative possibilities, three primary sources of inspiration were used as conceptual building blocks.

The first was incorporating the idea of play and promoting it as a fundamental design characteristic. Introducing a material play and presence with objects that symbolically represent virtual information. Forms that can be touched, held, constructed, and re-arranged in a physical space. By translating the concept of virtual information into simple tangible forms, it is both visualized and understood from a different perspective. The flow of information can be malleable and its path can be an organic process that is determined by formal relationships. There can be clarity and a sense of magic when virtual relationships between data are channeled by mechanical connections and hand manipulation in tangible objects.

The second influential model was the principle of emergence and designing open-ended systems. By establishing a few initial rule sets and then placing them in an unpredictable system, their interaction results in the evolution of an emergent experience. The inherent power in the unexpected can be used to constantly experience and re-author a kit with many possibilities. A constantly changing experience develops a durable engagement with a system (also aligned with the characteristics of cybernetics—limitation, feedback, and reiteration).

The final inspirational point of reference came from the charm and sensibility of childhood toys and learning tools. In particular the aesthetics and logic behind Froebel's invention of the kindergarten model in the 1800s. His sensitivity to materiality as a visualizing tool of symbolic education, where a universal abstract language of geometric form can cultivate children's innate ability to observe, reason, express, and create. A similar framework—play with something tangible to enhance the meaning of something conceptual—can be implemented to generate complex experiences through simple means. Attempting to merge childhood experience with adult expression by intellectually linking one's own material being with a virtual world.

Means of Evaluation

Both the music and news driven experiments were articulated through a collection of object-based interactions. However, it is important to emphasize that the incentives behind the formal realizations, the way they look and feel, were to represent alternate methods of interaction and served to satisfy conceptual goals. Their physical geometric language follows a prototyping methodology and is not intended to fulfill the criteria that are aligned with developing consumer products. In contrast, their material interfaces use formal vocabulary as a platform for critical reflection, as opposed to meeting the expectations of finished products.

This is a pivotal distinction but a fine line to articulate. It is an accepted norm in modern culture to have high expectations when dealing with objects that live in our physical world; therefore even when dealing with speculative design, the objects need to be sensitive to and accommodate these expectations. Formal design decisions have to be made in order to create material objects, and this still holds true in design research contexts. However this does not mean that those decisions (if not as well refined as a finished consumer product) are detrimental factors to the success of a design research object. The materiality and aesthetics of the speculative objects are still prominent characteristics. How they look and feel have to be key components as they are what draw people in and provoke curiosity. But their seductiveness lies in the relationship between that formal representation and the conceptual context in which it is placed. They are transformed into poetic objects, curious playful material symbols when connected to their context driven conceptual goals.

New Knowledge and Future Relevance

If a driving force behind these speculative objects is to generate new knowledge, one needs to ask what does new knowledge entail? It is an ambiguous concept and therefore to be constructive needs to be grounded in applicable contexts. One response to this question of relevance lies in responding to how the objects and methodology live on in future pursuits.

In relation to existing design research models, what conceptual space do they live in? As opposed to

models of critical design for political insight or strategies to understand product-marketing demographics, speculative objects generate knowledge for further design practice. They introduce ideas from a perspective that is intended to generate future development by elevating the significance of formal and interactive elements. Bringing them to the forefront and making them a prominent focal point. This focused research can then be re-channeled into future articulation, exploration, collaboration, refinement, and form making with a more coherent understanding of formal and interactive properties.

After realizing the creative process from start to finish and re-visiting initial motivations, it became clear that the process held further iterative relevance for both the designer and a broader community. From a designer's perspective, the speculative objects became models that tested a conceptual translation from ideation to form. They served as research tools that reflected upon an individual's working methodology. On a macro scale, the speculative objects also become ways to disseminate ideas to a diverse audience. The objects are tools that probe what associations and connections others may make based on their particular areas of interest—a platform to respond to that questions if particular new modes of understanding our world are relevant and worth pursuing.

Taking a discussion of an iterative process further, a possible next step would be to refine and integrate speculative objects into people's everyday lives. To be able to gain insight and document people's reactions and behaviors when these objects are situated in daily routines. Speculative design can become a conversation that translates qualities of emerging technology into experimental forms that are sensitive to human emotions and perceptions.

SPECULATIVE DESIGN AND EMERGING TECHNOLOGY

The sensory avenues in our modern society are contingent upon the affordances that current technologies provide. As technology evolves the designer must incorporate those changes into his or her vocabulary. However, a danger of relying on emerging technologies is that designers can become too tool driven. Just because one has the ability to do something doesn't necessarily mean that there is only one method to pursue or it is even a productive solution? Interaction with emerging technology should not be interpreted as developing 'universal remotes' that can predict our every need and desire and adapt accordingly. It needs to work in parallel and evolve with the complexity and diversity of contemporary culture. Innovation must not replace but rather work with and preserve the qualities that make us human. Speculative design integrates emerging technology into symbolic objects by embracing the notion of productive play and the illusion of the infinite; play that invites a reciprocal participation and back and forth tension. Innovation does not always lie only in the subject matter but also in the way that it is represented.

CONCLUDING THOUGHTS

Project-based design research can function as a way of asking questions and attempt to deliver plausible and provoking directions to pursue. The goals of further pursuing this strategy are not to necessarily fill but call attention to a void; pointing out the tenuous stitching in the fabric of ingrained cultural practices and illuminate alternative ways of thinking. There is a duality to design, thinking through creation and responding to observation. By working through a series of these associations, design research can attempt to visualize what isn't readily accessible.

An object-based speculative design methodology can create work that is responsive and engaging to us in a more tangible space by designing symbolic projects that emphasize their materiality—reacting in a tactile way simulating immediate interaction. We constantly strive for individuality but how will design contribute towards this desire for uniqueness in a world saturated with commodities promoting conformity? In a search for both innovative change and order, designed research objects have the ability to break up expectations of accepted social and cultural routines. They can simultaneously integrate media with objects and objects with information. These objects are creative tools that filter out or enhance the constant flow of information that we encounter every day and distill it down into a more productive form. As humans we see our bodies and possessions as symbols, metaphors that connect ourselves to our surrounding environment. Our

entire lives are a series of relationships with objects and people; there is a relationship between meaning and materiality. We learn through observation but constantly strive to decipher what we cannot see, aspire to touch what we cannot feel. A speculative design practice that provides productive entry points can help us pursue these ideals.