

The Co-ordinates of Design Fiction: Extrapolation, Irony, Ambiguity and Magic

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ABSTRACT

This paper argues that design fiction is a powerful term in part because it is malleable. A wide range of differing design fictions are emerging and we pursue a spatial metaphor to provide a map based on literary approaches. Following Margaret Atwood we trace design fiction back to marvel and wonder tales such as the Arabian Nights through to the science fiction of the nineteenth and twentieth century. We suggest science, magic, ambiguity and irony as the cardinal points of design fiction. We then apply these four different approaches to design fiction to the concept of a divorce app for older people. We argue that currently design fiction is dominated by scientific and ironic design fiction and suggest that magic and ambiguity are currently under explored.

Author Keywords

Design fiction; well being; older people; magic;

ACM Classification Keywords

H.5.m. Information interfaces and presentation

INTRODUCTION

In a 2013 keynote the science fiction writer who coined the term “design fiction” warned that we were going to see a lot more of it because it was cheap and relatively easy to do. He warned that this would lead to problems:

“There’s just gonna be way too much, there’s already way too much. What’s really needed at this point is some kind of categorization and logical organization for all of these techno-fantasies. Cos they’re interesting but they’re interesting in different ways. Like a techno fantasy that’s done by a clever nineteen year old girl that’s done in an art school is not in the same category as a Google Glass conceptual video [...] We need a taxonomy of dragons. We need somebody to go out - collect ‘em, brand ‘em,

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categorise’ em, say which is the good ones and which are the bad ones, put em in corals. Your group of people I’m thinking would be kinda ideal for that, it like suits your skills” [47]

Academics were already working on the task and in the same year a special issue of the journal *Design Creativity* provided a partial taxonomy of Design Fiction [24]. This taxonomy takes as a primary example the near future science fiction of Sterling’s friend and collaborator William Gibson. Gibson pays close attention to technological developments and his latest novel, in which drone cameras hover around celebrities like flies, is well researched and plausible.

Plausibility was key to Sterling’s 2005 definition of design fiction in his book *Shaping Things*:

“Science fiction wants to invoke the grandeur and credibility of science for its own hand waving hocus pocus, but design fiction can be more practical, more hands – on. It sacrifices some sense of the miraculous, but it moves much closer to the glowing heat of techno-social conflict” [46]

For Sterling design fiction writers think hard about how imagined technologies would work and what impact they might have. The social impact of technology also concerned Dourish and Bell, and their influential paper “Resistance is Futile” contrasted the visionary “Sal” [53] scenario by the Xerox PARC scientist Marc Weiser with popular science fiction like *Planet of the Apes*. Weiser’s scenario, written in the early nineteen nineties, envisioned many of the technologies that we use today. Sal works in an office linked with international branches by video links and distant workers collaborate on documents in real time. Dourish and Bell pointed out that popular science fiction TV shows were much more concerned with social context than conventional HCI scenarios usually were. There is little to no discussion of the kind of society Sal lives in [13]. What design scenarios typically leave unsaid is the implicit social and political context of a design.

The editors of the *Personal and Ubiquitous Computing* journal proposed a special issue with responses to this paper which included a piece by Julian Bleeker on design fiction [6]. Although the journal was not published until 2014 the draft papers were in circulation from 2009 and Bleeker’s was available online. Here he argued for the importance of

diegesis, a term from film studies used to indicate something that is part of a larger fictional world. For media studies scholars like Kirby the props in movies like *Minority Report* are “diegetic prototypes” in that they function as a part, rather than the point of a story, but also because they present the imagined technology as desirable or benevolent [28].

The partial taxonomy by Hale [24] included its use in corporate propaganda. Microsoft and Phillips have both presented design fictions in promotional films bearing, according to Gonzatto and van Amstela, the implicit message – “don’t worry the future is safe in our hands” [22]. Although it has corporate uses design fictions are more often conceived as critiques and provocations as in the “critical design” of Dunne and Raby [1,2,9,17]. Hale’s taxonomy, as suggested by Sterling, takes the originators of the fiction as a point of categorization: a corporate fiction by a company like Google is clearly very different to a fiction by a well established author like William Gibson. The taxonomy also considers the different forms design fiction can take - narratives, short stories, sketches, images, films but also objects and semi-working prototypes. Julian Bleecker’s work with the Near Future Lab now takes the form of magazine articles and advertisements for products and services that do not exist yet.

Design fiction is a malleable concept: it can take the form of text, image, audio, video, model, working prototype or event; it can be conceived as a plausible idea for a technology developed with “designerly thinking”, an eye for detail and practical concerns; it can be framed as a conceptual design placed within a broad cultural context focusing not just on product functionality but potential social consequences of use; it can be a tool for corporate propaganda or a means of expressing concern, dissent and critique. Small wonder then that such a flexible term has, as Sterling predicted, really caught on [e.g. 6,7,8,22,24,29,31].

While all of these competing definitions and categorizations are interesting and useful we propose in this paper a different categorization. This is based not on the source, the medium or the intent but rather the devices employed and the literary traditions at work. We do not employ a rigid methodology to develop an exhaustive taxonomy, rather we draw on literary analysis to identify broad patterns and family resemblances between fictions. This analysis is presented in the following sections with illustrative examples.

EXTRAPOLATIVE AND SCIENTIFIC DESIGN FICTION

Like Bruce Sterling and William Gibson, the founding father of science fiction, HG Wells, kept abreast of the scientific developments of his day. Wells is probably best remembered today for *The War of the Worlds* because of the many radio, television, musical and film adaptations. We now know that there is no life on Mars so Wells’ story would fail Sterling’s plausibility test today. But, despite the

famous opening lines of the novel, it is not quite true that in the 19th century “no one would have believed” that a Martian invasion was possible. In 1897, the year of the novel’s publication, life on Mars was considered at the very least a possibility. Wells’ other novels, though less widely known now, were fully plausible visions of the future, indeed some were fully realized only a decade or so after publication. *The War in the Air* was published in 1907 when human flight was as much of a fantasy for most of Wells’ contemporaries as it had been for the Ancient Greeks. And yet Wells predicted warplanes and aerial bombardment a full ten years before their use in the First World War. After reading some fairly obscure scientific work on the behavior of radium and strange particles Wells realized that were the energy described to be harnessed one day, then someone could make a bomb out of it. His novel, *The World Set Free*, written in 1913 predicted that humanity would develop the atom bomb by 1933. He was just a few years off. This kind of fiction is often described as prophetic though the claim is disputed by science fiction writers themselves.

Ever since William Gibson coined the term cyberspace in his 1984 novel *Neuromancer* his work has been described as “prescient”. Gibson objects to the term pointing out that science fiction writers make many, many guesses, most of which are wrong, but these are all forgotten if they get something right. *Neuromancer* did imagine a future where people spent a lot of time in a “collective hallucination” called cyberspace but as Gibson points out, it did not depict anyone using a mobile phone. That being said there is a well documented feedback loop between science fiction and technological R & D, indeed HG Wells’s *World Set Free* was known to the physicists working on the atom bomb.

In the documentary *How William Shatner Changed the World* a number of technology developers give direct credit to *Star Trek* for inspiring their real world inventions. The mobile phone was inspired in part by the Communicators used by the crew of the Enterprise. Steven Perlman started working on QuickTime after watching an episode of *Star Trek the Next Generation* where Mr Data walks into his quarters and asks the computer to play a particular piece of music [28]. Such science fiction was always already design fiction whether the authors intended it as such or not. Many science fiction writers were also scientists, most notably Arthur C. Clarke and Isaac Asimov. Clarke not only predicted satellite communication but also guessed at how transformative this technology would be. Asimov predicted a network of computers that would form something very like the Internet as well as formulating laws of robotics that many roboticists still take seriously today.

This kind of SF was described by Ursula Le Guin as “extrapolative”:

“The science fiction writer is supposed to take a trend or phenomenon of the here-and-now, purify and intensify it

for dramatic effect, and extend it into the future. "If this goes on, this is what will happen." [29]

The method is not necessarily accurate, as this quote by GK Chesterton illustrates:

"Just as when we see a pig in a litter larger than the other pigs, we know by an unalterable law of the Inevitable it will some day be larger than an elephant" [13]

However it might be thought of as scientific and rationalistic. It takes its inspiration from scientific research and seeks to make predictions or warnings and presents itself as plausible. The rhetorical tropes draw on the Enlightenment traditions of rationality and scientific progress.

Extrapolative or Scientific Design Fiction Examples

Examples of extrapolative or scientific design fiction would include Google's *Project Glass* [23] Here Google imagines a day in the life of a young man with smart glasses. He is able to arrange his meetings on the go while following a map towards his favorite coffee shop. Microsoft's vision for the home of the future [33] can be seen as an invitation to a future where their products permeate familiar environments, e.g. cooking recipes projected on the kitchen counter. The Museum of Future Government Services [52], a commission by the United Arab Emirates, is a collection of design fictions where "governments and society work together to create a more hopeful world". There are designs for the smart street, where augmented reality enhances social interaction, workshops for cars that are also offices and mobile health services. Imagining tomorrow by extending the scientific scope of today forms the ground of Wired Magazine's vision of the future of the Super Bowl [54]. This 3 minute design fiction portrays the famous football event in the year 2066: players follow coach instructions projected within their helmet, supersonic flights are common so the same football league gathers teams from cities all over the world and fans watch the matches through augmented reality devices.

Other design fictions that might be regarded as "scientific" in this sense include:

Life Support [42], a series of prototypes that explore how animals could be transformed into medical devices to aid humans in breathing or blood filtering.

Drone Aviary [49], an exploration of civilian drones in advertising, media, surveillance, traffic management and life logging through film, exhibitions and publications. E.g. *Madison*, a Flying Billboard that uses facial recognition to tailor advertising content to those around it.

The Microbial Home [38], a set of objects for the home viewed as a cyclical system where, for example, waste from a module becomes the energy source for the next.

Game of Drones [30], a piece of speculative research that gamifies law enforcement activities to allow members of the local community to act as enforcement officers by piloting drones and acting on, for example, parking offenses or dog fouling.

Telecommunications in the 1990's [39], a realistic and surprisingly accurate scenario (filmed in 1969) depicting how distant communication might play out in the future. These scenarios resemble current day services such as Fax, Wi-Fi or videophones.

CRITIQUE AND IRONY

Extrapolative or speculative fiction does not always subscribe to Enlightenment models of technological and rational progress. There is a very long tradition of fantastical writing which critiques and satirizes society. Eighteenth century Travellers tales were often far fetched and *Gulliver's Travels* took this form as the basis of perhaps the most enduring and famous satirical tale. Here Jonathan Swift depicts creatures like the Struldbrughs, immortals who cannot die but continue to age. Doomed to decrepitude without the release of death they are declared legally dead when they are eighty and their marriages become null and void. They are allowed to hold no land in order to prevent them from seizing all power and wealth through the sole virtue of longevity. The tradition of such satirical fantasy is carried through into science fiction through writers like Kurt Vonnegut. Vonnegut was a profoundly pessimistic writer but as a young man he believed that scientists would one day discover God's phone number. He famously remarked that he lost faith in science when they dropped it on Hiroshima.

Vonnegut was a major influence on Douglas Adams who finally abandoned his famous battles with publisher's deadlines in order to become the "chief fantasist" at a technology start up. Adams imagined not only future technologies such as Eddie the annoyingly cheery shipboard computer and Marvin the paranoid Android but also the company that would make them. The Sirius Cybernetics Corporation is one of Adams finest comic achievements. The Sirius Cybernetics Corporation define a robot as "your plastic pal who's fun to be with". The Hitch Hiker's guide to the galaxy defined the Sirius Cybernetics Corporation as "a bunch of mindless jerks who would be first up against the wall when the revolution came". Adams' imagined his Hitchhiker's Guide to the Galaxy as a constantly updating composite text edited by hitchhikers researching stories on their travels. It can be seen as a design fiction precursor to Wikipedia and indeed before Adams died H2G2 attempted to make the guide a reality with volunteer writers and editors.

Ironic and satirical fiction can be grouped or corralled with the critical design work of Dunne and Raby. Dunne and Raby's drew on the Italian Anti Design movement and the Radical Design movement that began in architectural studios and produced disturbing images of homes of the

future that looked like cells in a factory in the “No Stop City” [12]. Their Critical Design was ground breaking in HCI because it demonstrated that design need not be simply a solution to a set of requirements specified in response to a given task or set of constraints. Design might also be a critique, like a political essay or satirical sketch. In *Design Noir: the secret life of electronic objects* they convey a number of innovative and subversive proposals, for example, head mounted cameras allowing users to tune into different people’s lives as if they were TV channels:

“proposals like these can really only exist outside the marketplace as a form of “conceptual design” – meaning not the conceptual stage of a design project, but a design proposal intended to challenge preconceptions about how electronics shape our lives.” [15]

They suggest that such designs might be expressed as text or films and that academic designers might be best placed to explore this socially responsible role. But their work over the years to follow was not confined to proposals. The compass table, for example, has a top filled with compasses that twitch and turn whenever an electronic device is placed on it, making visible the magnetic fields we carry around with us in our bags and pockets. Dunne and Raby did in fact make this design available on the marketplace and it was auctioned for several thousands of pounds [9]. This is the strength and perhaps also the weakness of such critical artefacts.. In order to appreciate it one must have a degree of cultural capital, to own it one must simply have old fashioned economic capital. Critical design is not only challenging it can also be comforting: our appreciation of it can indicate our inclusion in a group or political affiliations it can also be a status symbol. Like critical art, it is sometimes ultimately a commodity, easily absorbed into the social order it condemns.

Critical or Ironic Design Fiction

There are a great many critical or ironic design fictions. The Near Future Lab's TBD [34] features an advertisement for an automatic car with a game passengers can play to avoid boredom during the journey. The windshield becomes a video screen where targets are projected onto the road for players to aim at. Explosions also feature in the early work of Dunne and Raby. The Huggable Atomic Mushroom [16] now part of the permanent collection of the MOMA NewYork, is a stuffed object in the shape of an atomic explosion. It ingenuously provides people afraid of nuclear catastrophe with a means to gradually overcome their weakness. Also in the tradition of critical design, the work “I wanna deliver a Shark” from Ai Hasegawa [25] explores the possibility of humans giving birth to endangered animal species and includes a diagram depicting the reasons why a mother might decide to pursue such idea. Contradictions become apparent in the intelligent depiction of a possible future of the smart home in “Uninvited Guests” by Superflux [50]. In this short movie, an independent old man sees how his privacy is invaded by a set of smart utensils

sent by his children and finds his own “dumb solutions” to his new smart problems (e.g. a young neighbor exercises with the activity tracker in exchange for beer so activity tracking results are excellent.).

Other ironic or critical design fictions include:

Infinite Souvenir [14], a tabletop device with a container to safely store a small amount of nuclear waste that produces enough electricity to keep particles moving in a souvenir snow globe like mechanism.

Menstruation Machine [45], a device that simulates how menstruation might be experienced. It relies on mild electric shocks to simulate pain and a blood dispensing system. The design takes the form of a pop video that depicts a young adolescent using the machine during a night out in Tokyo.

The Transparency Grenade [36], a device presented in the form of a Soviet F1 Hand Grenade. It makes the process of leaking information from closed meetings as easy as pulling a pin.

Ex-Boyfriend Revenge Kit [26], a set of elegantly designed tools to accomplish (fictional) murder with style. A teal leather bag contains a rope, a teal bondage tape, a mini crowbar, a knuckleduster, syringe and truth serum, a teal balaclava and soft teal leather globes.

ALTERNATIVES AND AMBIGUITY

Ursula Le Guin’s *Left Hand of Darkness* [29] describes a world with only one gender, in the mating season one or another of them will develop male or female characteristics, the rest of the time they are celibate and when they meet their first human they consider him to be a pervert. In a famous introduction to this work Le Guin makes the distinction between “extrapolative” SF and the kind of fantasy which claims no basis in reality and does not pretend to prophecy. Although there are clear feminist messages within *Left Hand of Darkness* text it is not clearly didactic or propagandistic.

For Margaret Atwood such work draws on the wonder tales of the ancient world. The tales of the Arabian Nights were originally told in marketplaces by travelling storytellers, embellished and changed with each new telling. It was only much later that they were written down and some scholars argue that they are amongst the very earliest achievements of the human imagination. Although the Grimm brothers collected their fairy tales together in the early nineteenth century they knew then that they were very old indeed. Recent evidence suggests that some of them may be at least four thousand years old. These tales relate to fears and desires as old and deep as humanity itself. They are deeply ambiguous and work within this tradition is also less openly didactic than much extrapolative or satirical fiction.

Ambiguous Design Fiction

The Continuous Monument, from Superstudio [51] consists of gigantic structures superimposed over city landscapes.

These strange gigantic floating grids hover over the city in New New York, they are disturbing and difficult to interpret. The Ikea Catalog For The Near Future [35] is a collection of intriguing scenarios where the home has been transformed through technology. For example Data gathering sofas, self-replenishing shampoos with life-time subscription only or gardening drones. These are all plausible products but it is unclear if the authors are advocating the designs but neither are they obviously ironic. Ambiguity is the essence of *Err* [35], a project by Jeremy Hutchinson. The artist commissioned workers to introduce errors in the products they ordinarily manufacture. The erroneous products resulted in intentionally misinterpreted functionality and provide an ambiguous ground for reflecting on consumer culture, necessity and craftsmanship.

Other ambiguous design fictions include:

Traces of an Imaginary Affair [21] a kit containing a set of nine neat tools that can be used to create the illusion of having experienced a hypothetical love affair. The tools leave marks on the body like love bites, scratches and bruises.

ARK-INC [48] an electronic product that possess covert properties to be activated (e.g. radio receiver becomes able to transmit), when a profound political or economical crisis hits.

Kickstriker [5] a crowd-funding platform for activists to economically support those initiatives they consider relevant (e.g. Military training for Tibetan monks to resist a Chinese invasion.)

75Watt [41] a product designed so its construction results in a particular choreography performed by the workers in a developing country industrial assembly line.

MAGIC AND WONDER TALES

Literature, like dreaming, is, at a fundamental level, concerned with wish fulfillment. The wonder tale articulates, perhaps better than any other, our deepest desires and fears. It may be for this reason that the ancient form of the wonder tale persists in the “magic realism” of authors like, Will Self, Gabriel Garcia Marquez and Salman Rushdie. Here miracles happen almost without comment and certainly without any scientific explanation. Magic realism describes wonders without recourse to any rationalist accounting. In *The Satanic Verses* for example Salman Rushdie describes a hospital where each of the patients is afflicted with a magical malady. A man with a tiger’s head explains that they are victims of language – they describe us and we succumb to their descriptions.

Magic Realist Design Fiction

Design fictions rooted on the supernatural are rare. In related work [19] we have drawn explicitly on magic realism, a genre where the miraculous is described as any other everyday occurrence, with no attempt whatever at

explanation. A series of short stories written in the form of an altCHI paper pictures a design studio where design fiction prototypes unexpectedly begin to work as described. A Dream Catcher initially envisioned as diegetic prop begins to capture actual images of real dreams. When someone is described as fat or old on a gossiping app they immediately gain weight and wrinkle. An Author Eraser allows users to remove the names of senior academics who made no real contribution to papers where they are listed as authors. The paper ends with a solution printer, a machine that can print the solution to any problem specified: from a cure for baldness to a clean energy generator.

Other design fictions that could be considered as magical in the sense that they offer no scientific or rational explanation for the fantasy include: *Addicted Products* [40] a fiction that follows Brad, a toaster that communicates with other toasters in the vicinity and might, for example, leave and go to another home where it is needed more.

FOUR DESIGN FICTIONS

The following sections present four design fictions around a divorce app aimed at the over sixty fives. In the UK there has been a surge in the divorce rate amongst the over sixties [37]. The sociologist Zygmunt Bauman describes modern love as liquid: we are in relationships only until further notice [4]. At the same time there is increasing dissatisfaction with solicitors charging exorbitant fees for routine legal services and many predict that this kind of work will be automated [e.g. 32]. The following design fictions take different approaches to the same ideas based on the preceding categories. The first (figure 1) is extrapolative, imagining what a divorce app might look like today. The second (epilogue) is critical and ironic, expressing dissatisfaction with family lawyers by imagining a future in which they no longer exist. The third is more ambiguous, presenting itself as a provocative advertisement for such an app, encouraging silver breakups. The fourth is a magic realist short story presenting miracles and magic without technological apology.

DF1: BreakApp

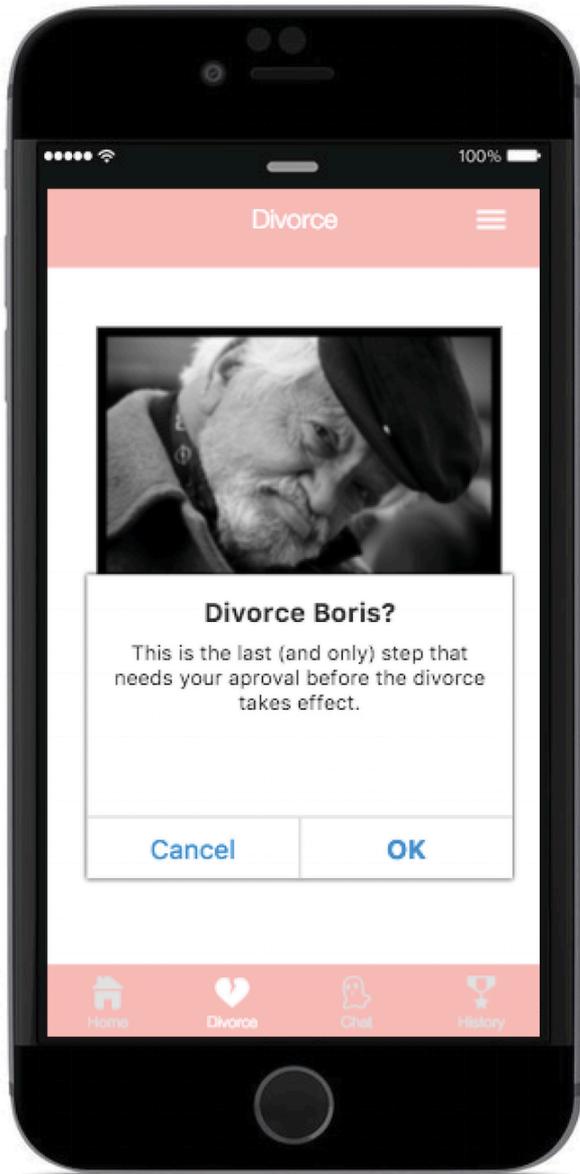


Figure 1: Screenshot of BreakApp

DF2: Epilogue

Few would have suspected, least of all her husband Boris, that at the age of one hundred and one Annabel Bide would swipe for a divorce.

“But we’ve been together for seventy six years!” Boris protested.

“Twelve years a slave is no rationale for a thirteenth” she texted back, returned to the main menu and selected “Divorce”.

“There” she smiled brightly at her great, great granddaughter, “all done – oh, wait” she glanced back at the device irritably, “do I want half of the marital assets? Well, of course I do,” her already furrowed brow became more so

“and... yes, there! Money transferred and all done. Splendid. Goodness me that’s an improvement on wrangling with solicitors.”

“Solicitors?” Shanti looked puzzled.

“They were a sort of lawyer.”

“A lawyer? Shanti remained mystified, “why would you need a lawyer? Nobody has committed a crime.”

“In the old days you used to need a lawyer to negotiate financial settlements and make arrangements for the children.”

“You wouldn’t just split the assets fairly?”

“No, each party battled for as much as they could get. “

“And the lawyers helped mediate?”

“Oh no, it was an adversarial system, the solicitors attacked your ex by proxy, intimidated and insulted them for you. They made the divorce as acrimonious and bitter as possible, endlessly wrangling about basic points of law and charging you for letters– written on paper and posted through holes in your door! It’s a wonder they didn’t charge for running their whale oil lamps.”

“And they allowed these people to be involved in settling childcare arrangements?”

“Yes, that was one of their most profitable lines of work: people would throw their life savings at a divorce and then get into tremendous debt. The court judgments were so predictable that they could be replaced by an algorithm and of course, eventually they were. Hence these handy divorce apps. Hang on dear” she looked back at her phone for a moment, “I’m just going to sell the house” she swiped the phone a couple of times, “There we are, done. That’s another miracle of the modern age – no more estate agents!”

“What were they?”

“Well you’d register your house with them, they’d take people round to see it and explain that “this is the bathroom” when they were standing in the bathroom, do some totally routine paperwork charge you a hefty fee for it and also take a percentage of the sale. Astonishing really. Good riddance to them I say. Oh and here’s Boris’ agreeing to the price – good riddance to him too.”



Figure 2: Boris Bide.

DF 3: BreakApp Advertising

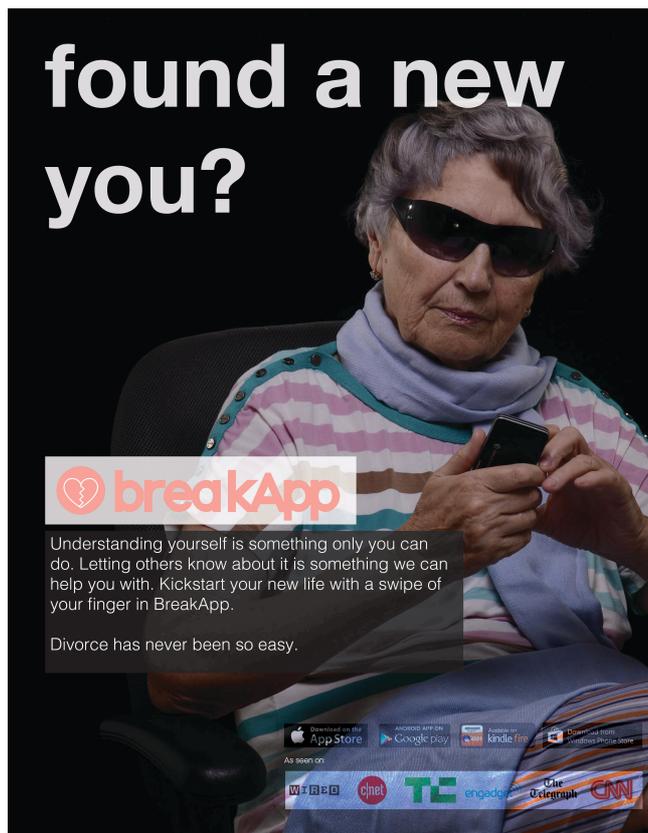


Figure 3: BreakApp advertising campaign

DF4: One Hundred Years of Solicitude

Many years later, as she sat with her dog's head resting in her lap, Shanti Isobella, Francesca Bide remembered the first words of magic she heard her great grandmother utter: "because I said so". With this incantation Annabel had declared the ice caves in the mountains out of bounds and Shanti understood that language had the power to remake the world. When certain words were spoken people, places and things were changed forever. Her father, when certain rituals had been performed vanished just as mysteriously as if some magician had rendered him invisible. When Annabel announced she no longer wanted Boris to be her husband Shanti wondered what he would be instead. A cockroach had been the old woman's first thought, she imagined crushing him beneath her heel. Shanti was horrified and objected that, apart from anything else, you can never kill cockroaches like that. Then Annabel toyed with the idea of turning the old man into stone and using him as a water feature in the garden. When Shanti said she still wanted to be able to see her great, great grandfather Annabel said she could visit whenever she wanted and perhaps grow some ivy over him. When they finally decided on a transformation that would work for everyone Annabel muttered the words and the metamorphosis began. At first Boris did not notice the changes to his hands, feet

and face, it was only when he lost the power of speech that he realized what was happening and began to yelp in terror.

"But now you are used to it and we are all happy no?"

Shanti stroked Boris' head as she got up to answer the door. When she returned with Annabel, Boris' tail was wagging excitedly but he knew better than to jump up and try to lick her face. He kept his head low but his tail thrashed the air and he surged forward if she so much as looked at him.

DISCUSSION

Like Harlan Ellison in the nineteen sixties [20], Bruce Sterling differentiates between "speculative" science fiction based on things that might actually happen and fantasy tales unlikely to ever occur. Margaret Atwood, another eminent science fiction writer, rejects such distinctions pointing out that when Mary Shelley wrote Frankenstein she had reason to think electricity might reanimate dead flesh. Atwood places speculative fiction, science fiction as well as sword and sorcery under a single umbrella of "wonder tale". A broad focus on the wonder tale allows inclusion of the Arabian Nights (with its wish granting genies in lamps, bottles and rings), Grimm's Fairy Tales (with magic mirrors that tell you how attractive you are and seven league boots that take you wherever you want to go in a few strides), Ovid's Metamorphosis (where weeping women become rocks), Gulliver's Travels (where sunbeams are extracted from cucumbers), Dr Jekyll and Mr Hyde (where inner demons are released through imbibing chemical compounds) Kafka's Metamorphosis (where a man becomes a bug) Superhero comics (where men fly through the power of the sun or the armor they have made) as well as the Harry Potter books (where a clock reveals the location of each family member). Although there are clear divisions between these kinds of fictions they can all be useful source material for design fiction because they express human desires. For example, Microsoft researchers did their best to make a whereabouts clock inspired by Harry Potter [44].

In Science Fiction, technology occupies the same function within the structure of a narrative as magic does in wonder tales. For example the "Deus Ex Machina" (God from the Machine) in the Greek theatre was an actor playing a character like Zeus who would be winched onto the stage to rescue the hero from a seemingly inescapable predicament. When Captain Kirk and his men are teleported out of difficult situations in Star Trek the device being used is the same one, with technology taking the place of a supernatural agent. Similarly magical objects which give the hero additional powers are substituted with technological artifacts. In Greek mythology Perseus is presented with a sword from the Gods that can cut through stone just as Luke Skywalker is gifted a light sabre with identical properties. It is no accident that it was a science fiction writer who first pointed out that any sufficiently advanced technology is indistinguishable from magic [13].

Any imaginary technology within a sci-fi narrative is a paradigmatic substitution for magical objects.

Although we argue that the wonder tale should be included in an overview of design fiction its rhetorical tropes differ from those of science fiction. The appeal in the wonder tale is to the supernatural rather than the rational. Nevertheless, as with the whereabouts clock, the material might inspire design. Although extrapolative and ironic design fictions dominate at the moment ambiguous and magical design fictions have also begun to emerge. To pursue a spatial metaphor scientific extrapolation, irony, ambiguity and magic can be thought of as the co-ordinates of design fiction.

The semiotic or Greimas square is an analytical tool used to map contrary, contradictory and implied terms.

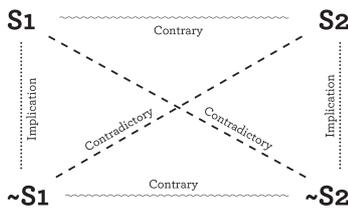


Figure 3: Greimas Semiotic Square

The terms “science” (S1) and “non- science” (-S1) might form the contrary terms at the left hand corners of the square with “magic” (S2) and “non magic” (-S2) on the right. The first two design fictions are extrapolations on current trends and so might be placed somewhere along the line of S1 (science) and –S2 (not magic). The 4th magical fiction would be placed somewhere between –S2 (magic) and –S1 (not science). A similar map square could be made with the terms “ambiguous” and “not ambiguous” as S1 and –S1 with “ironic” and “not ironic” as S2 and –S2. The advertisement would be closer to Irony, the magic realist story closer to ambiguity. It would be possible to map each of the design fictions mentioned in this paper along such co-ordinates but of course many of them would not fit neatly into one category or another. In *Sorting Things Out* Bowker and Star argue that any classification scheme becomes at its borders arbitrary: for example, during apartheid in South Africa officials would have to classify the race of white babies born to black parents and vice versa [10].

Rather than create a series of Greimas squares we present a rather more fanciful map suggesting the co-ordinates of design fiction. The image in figure 4 recalls the maps that often begin fantasy novels, perhaps it also connotes some of the medieval maps recently collected by Umberto Eco [18] of fictional lands that some thought actually existed.

Most of the Design Fiction reviewed in this paper is scientific in the sense that it is extrapolative. Much of this design fiction is also very often critical or ironic. At the end

of the last century the novelist David Foster Wallace began to complain about the constraints of irony. He argued that irony had been the dominant form of expression for American novelists for most of the twentieth century and this was ultimately enfeebling. Julian Barnes in a recent novel about Shostakovich’s life under Stalin makes a similar point:

“You woke up one morning and no longer knew if your tongue was in your cheek; and even if it was, whether that mattered anymore, whether anyone noticed.” [3]

Under Stalin it was sometimes possible to get away with irony while sarcasm could get you shot. Although irony is easier, allowing an escape from a particular position – I didn’t really mean it you know, just a bit of irony, ultimately it is a weapon of the weak. The sketchy map presented here suggests that there is currently more extrapolative and ironic design fiction than any other kind. This tells us something about the field of Design Fiction as it currently stands but also indicates the wide space of future undiscovered countries.



Figure 4: Map of Design Fiction

CONCLUSION

This paper has attempted to sketch the co-ordinates of design fiction as it is currently practiced in HCI and related fields. We have grouped fictions together according to related but separate strands of wonder tale around the broad headings of science, irony, ambiguity and magic. The categorization suggests that the most frequently employed design fictions are broadly scientific in the sense that they are extrapolative, drawing a line from historical trends out into the future through progressive exaggerations. Such work is often directly critical or at least ironic. We suggest that there may be rich possibilities in the more or less undiscovered countries of design fiction.

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