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## Repairing the fictional fractures between art and science

"When are you going to stop playing around painting pictures and do some real work, Joey?" asks Luke, a friend of 15 years. There is no point replying with reason though, Luke is a steely civil engineer and his tittle-tattle is part of an old school-friend bonding ritual. The painted pictures to which he refers do not truly exist; but I did study for a degree at an art college and I guess that's what he is referring to. Ironically though, I'm incredibly amateurish at practicing visual arts. I cannot paint or draw, at all. Despite Luke's disparaging tone, I wish I could have been painting pictures. That's a skill that really would come in useful for the research I'm currently doing at the HighWire Centre for Doctoral Training at Lancaster University.

At the HighWire Centre I'm completing a PhD researching a type of speculative design called design fiction. Speculative design approaches are not concerned with an end product to sell or put into production. Instead design is practiced in the spirit of inquiry, in order to generate insights. These practices look to shed light on what is coming next, specifically to understand how can we use design to direct us toward a 'preferable' future? Design fiction does this by constructing worlds, by telling tales: It's about stories. From inside these fictional realms yet-to-be-realised technologies can be prototyped and seen working in a 'real' environment (real to the story-world, that is).

At parties and alike when the inevitable get-to-know-you question of "What are you studying for your PhD?" is asked of me, I reply by saying "I make up stories about the future". Which, to some audiences sounds quite absurd. After all PhDs are the highest level of University degree, they are scientific and impart the almost ethereal 'contribution to knowledge'. This lofty objective, to be achieved with scientific rigour, seems incongruent with 'making up stories about the future'. Curiously though, if you unpack the reasons why my approach to researching design fiction manages to be PhD-level science, whilst also being based on stories of the future, then an interesting perspective on the relationship between art and science emerges.

The crux of the matter is that I have had to learn to think in a new way that unifies art and science. The differences between art and science cannot feature in my thinking any more, nor do the similarities between the two. Instead I have had to develop a conceptual frame where art and science are two parts of the same phenomenon. You could call this phenomenon a continuum or a spectrum. However in order to allow all of the layers of complexity required to represent all of art, and all of science to be encoded within a single concept, I prefer to see it in terms of a 'gamut'.

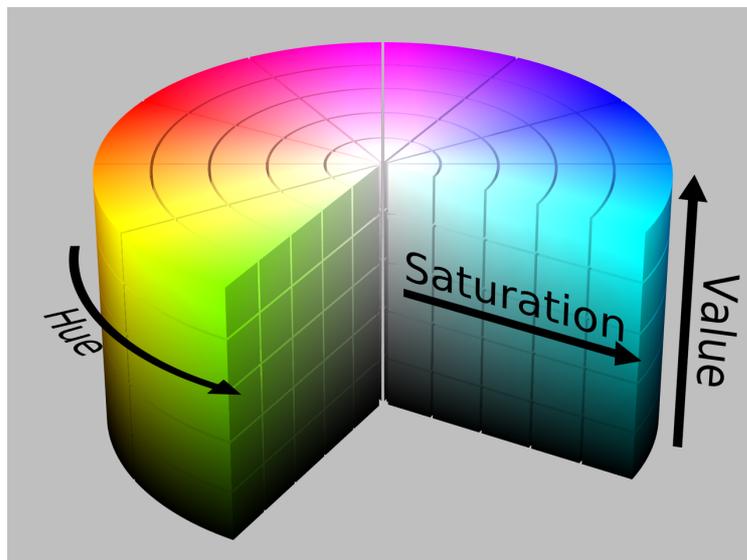


Fig. 1 An example of the hue-saturation-lightness gamut. Image credit: SharkD (Licenced as CC BY-SA 3.0, [http://en.wikipedia.org/wiki/HSL\\_and\\_HSV](http://en.wikipedia.org/wiki/HSL_and_HSV))

This gamut (Fig. 1) describes a range of colours, in this case in terms of the hue, saturation and lightness. In this way a single object can describe the extremes

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(black, white, yellow, magenta, etc), as well as the infinite possibilities between the extremes.

I have come to think of an art-science gamut that contains the 'artiest' art and the most 'sciency' science, as well as everything in between. This gamut can describe any one of the practices that exist on the tapestry of human endeavour. Returning to the colour metaphor, much as green and red are different from one another, have contrasting semiotic affordances, and can be used to mean very different things - they are undeniably both colours. Art and science behave in a very similar way. They are different from each other and they have contrasting uses, properties and attributes. But fundamentally they are both part of the same venture: that is one of human inquiry.

In spite of my friend Luke teasing me about my art degree, and the fact that I am often stereotyped as 'the artist', I am actually a very logical person. I like things that can be tested, triangulated, and reduced. I like science. Science begins with observation, observations lead to the formation of theories, and theories make predictions. Experiments test these predictions. That is the scientific method in a nutshell.

Early in my PhD work I was puzzled as to how to apply this method to researching design fiction. How could I reductively research the act of making up stories about the future? (Let alone understanding the impact of these stories). Thankfully I came across a research paper that helped me to resolve this conceptual disconnection [1]. The paper immediately piqued my interest when I saw the legendary anthropomorphic egg-come-philosopher Humpty Dumpty quoted early on in the paper.

“

**When I use a word, it means just what I choose it to mean - neither more nor less**

Humpty Dumpty

”

This same quote has been used for over a century to highlight the challenge of defining the true meaning of words and how they are used (including in numerous legal cases). Depending on context, words can mean drastically different things. The words 'art' and 'science' are no exception, and by looking at historical definitions may add some weight to the contention that they are in fact part of the phenomenon. For example one version of the Oxford English Dictionary from 1950 offers 'science' as a definition of 'craft'. Meanwhile 'one who pursues practical science' is offered as a definition of the word 'artist' [2].

However dictionary definitions are not the be all and end all. Perhaps more crucial is how these words are used and what they represent.

Frayling introduces a few obvious yet revealing stereotypes. For example it is clear that artists do not operate scientifically. The artist tends to embrace that long-standing enemy of science; ambiguity. Designers and inventors are the doers and makers of the world. Practical tinkersers domiciled to their garden sheds, mysteriously working towards a solution (Barnes Wallis - inventor of the 'bouncing bomb' - is used as an exemplar by Frayling). Scientists are cast as rational adopters of structure, hypothesising, predicting, and experimenting (as per the method described previously). Finally, these stereotypes can be unified under a fourth. That is of the practitioner. Everything and anything that a scientist, artist, or designer may do, can be described as 'practice' one way or another (and hence 'practice' has the same definitional challenges as the other terms).

Contrasting these stereotypes with what designers, artists and scientists actually do, we begin to see how the terms are but placeholders. The fact of the matter is that 'doing science' is incredibly rarely an exercise of pure logic or rationality. It cannot be described solely by a discrete series of steps to follow. Scientific investigations are actually much closer to design activities. Meanwhile design is not reducible to the product of experimental doing and making. Rather, it is an incredibly elusive amalgam of intangible creative sparks combined with a working comprehension of engineering principles, aesthetics, and most importantly an appreciation of the problem or opportunity that is being designed for. As for art, one way to describe art's utility is by saying it is the formal study and practice of those 'intangible creative sparks' that designers depend upon. That may be true. But in reality art brings much more to the table than creativity alone. Art is the abstract philosopher; it is questioning, moralistic, inspirational and exploratory. So these terms (art, science, design, practice, research) are not only ambiguous when compared to their dictionary definitions, but our stereotyped perception of them is wide of the mark too.

Frayling's exploration has a particular goal, to explain how art relates to research. One of his conclusions is that it is possible to do research through art and design. An example of this may be discovering knowledge about the properties of materials, through building artworks with them. In the case of my research, I am producing knowledge about design fiction through practicing it. It is that practice that necessitated a shift in my thinking away from seeing art and science as distinct, to seeing them as part of the same conceptual object (that I refer to as the art-science gamut).

You see, to make a good design fiction, creative juices need to flow. The myriad of intangible creativity characterised by art practice plays a big part in imagining these fictions. However, getting the engineering and science right is crucial too. Facts must be incorporated into the story sensitively. The traditions of design tie these raw materials together, as well as informing how the story may look and sound (it isn't called design fiction for nothing). Much as scientific discoveries do not happen by following a step-by-step procedure, design fictions cannot be made on a production line according to a method or formula. Hence differentiating between what role art, science and design plays in the process becomes a hindrance. Instead, the labels of

more must be forgotten. That is not to say the knowledge and skills represented by the terms artist, designer, and scientist are not important, however the implicit affordances of the terms become unhelpful. Design fiction does not operate across the art/science boundary and it does not require collaboration across disciplines. At least I do not think so. Instead, design fiction works within an art-science gamut (e.g. Fig. 2).

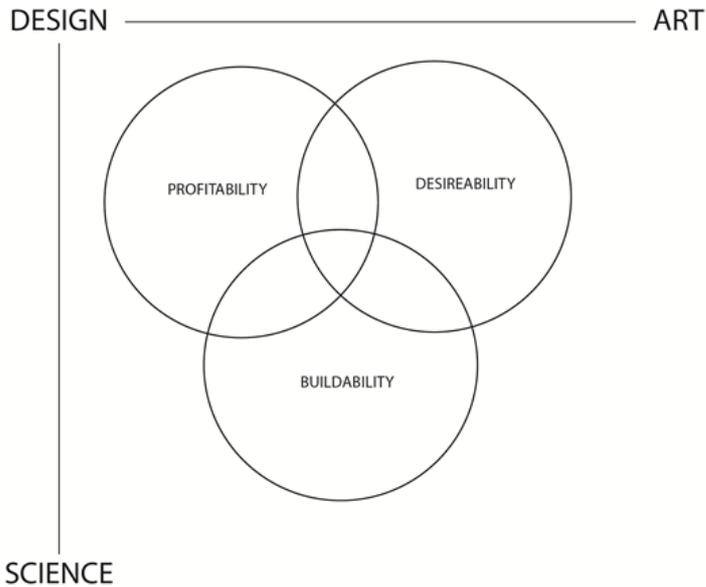


Fig. 2 One interpretation of the art-science gamut as it may apply to speculative product design and design fiction.

There are wider implications of this that go beyond my particular brand of future-orientated storytelling. During the industrial revolution underpinned the separation of the arts and sciences, specialisations were absolutely necessary in order to allow modernity to blossom. In our post-industrial networked age though, in order to do specialised tasks a myriad of skills are often required. An architect may need to be as proficient in Python programming as a computer scientist, a designer may need to be an ethnographer and mathematician, while our management gurus need to understand design processes. And so on, and so on: you get the idea.

In contemporary academia and in industry, interdisciplinarianism is a must, either to deliver a complex requirement or simply to leverage the value of working across disciplinary boundaries [3]. If for a moment though we suppose that art and science are part of the same phenomenon, which can ultimately be described as the product of humanity's aspirations, then perhaps – in our current time – we are making life harder for ourselves by even considering these as distinct concepts. Let me finish with a design fiction of sorts, a story of a University system where our current paradigm persists alongside another that adopts the art-science builds from the concept of the art-science gamut.

Imagine a two-pronged approach to University education and research. One prong operates very much as Universities do today, students and researchers will usually have a home discipline, and may specialise within that area. The second prong's education and research however, will not differentiate between disciplines, or between art and science. This art-science gamut-embracing prong will produce generalists, individuals unconstrained by the preconceptions and stereotypes associated with our traditional labels. Between these two educational and research prongs, the next generation of scholars and researchers would emerge, and maybe the contrasting approaches would actually allow us to leverage the best of both worlds. Powered by computation, technology and networks, our civilisation is moving faster than ever and faces increasing intractable problems. Maybe the reunification of art and science, in terms of a gamut, could be part of a long-term strategy to help solve them.

“  
**..may not landscape be considered as a branch of natural philosophy, of which pictures are but experiments?**

John Constable, cited in [1].

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 In response to my friend Luke: we always have and always will need trained engineers, and you are an exceptional one. Also, I know for a fact that I am not one of them! However I'm not entirely useless. One trait I'm proud of is my ability synthesise understanding from disparate sources. Your comment over dinner, Luke, I think is a product of the existing paradigm. It assumes art and science have nothing to do with each other, and indeed should not have anything to do with each other. It is not for me to say that is right or wrong, or whether my conceptualisation of an art-science gamut is useful in general terms, but, it is certainly good fun thinking about it.

## References

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