

Science Fiction Prototypes

Or: How I Learned to Stop Worrying about the Future and Love Science Fiction

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Abstract. This paper is meant to be an introduction both to the short story *Nebulous Mechanisms* as well as the concept of science fiction prototypes. In the tradition of the legendary Isaac Asimov, we jump into the long and symbiotic history of science fact and science fiction. Briskly we move through current work in the field and delve into the particulars of the craft of combining current scientific research, theory and practice with the fictional construct of the science fiction story. Finally we look into the specifics of the story *Nebulous Mechanisms* and conclude with the challenge to employ the science fiction prototype to foster innovation and explore the boundaries of modern science.

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Introduction

Nebulous Mechanisms, the story that follows this introduction, is an unmistakable work of science fiction. Firmly rooted in the rich history of the genre, the story is filled with what you might expect; space stations, asteroid mines, space travel, robots and a good healthy dose of pulse-quickenning drama -- all the right ingredients for a good old fashioned sf tale. But *Nebulous Mechanisms* is a bit more than just a good story; it is also a fictional prototype. The foundational idea in the story is based on a theory outlined in the paper *Using Multiple Personas in Service Robots to Improve Exploration Strategies when Mapping new Environments* (Egerton, Callaghan, Clarke). We used the story as an intellectual experiment to explore the theory in the paper and examine its implications in an imagined future. Think of it as a virtual reality on paper, specifically designed to test the possible ramifications of the theory. *Nebulous Mechanisms* was the first in a successful series of science fiction stories based on emerging theory and research from the fields of robotics, computer science, artificial intelligent and neuroscience.

In this introduction I wanted to give a little history and background for the science fiction prototype but before you read on you may want to jump ahead and read the story. I don't want to give anything away but you might want to go find out why the robots on the dwarf planet 1 Ceres are going to church...

1. *Science Fiction is the only true literature of the twentieth century*¹

The blending of science fiction and science fact is not revolutionary; their symbiotic relationship goes back hundreds of years. It's been well documented that science fiction has inspired generations of scientists, researchers and even astronauts. British science fiction author, inventor, and futurist Arthur C. Clark summed it up this way in his essay *Aspects of Science Fiction*. "All of the pioneers of astronautics were inspired by Jules Verne, and several (e.g. Goddard, Oberth, von Braun) actually wrote fiction to popularize their ideas. And I know from personal experience that many American astronauts and Soviet cosmonauts were inspired to take up their careers by the space travel stories they read as children. (One of my proudest possessions is a little monograph, *Wingless on Luna*, bearing the inscription, 'To Arthur, who visualized the nuances of lunar flying long before I experienced them! – Neil Armstrong.')

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As Clark points out science fact and fiction have been explicitly intermingled for most of the twentieth century. Physicists and rocketry pioneers Robert Goddard, Hermann Oberth and Wernher von Braun used stories as a way to popularize their thinking while astronaut Neil Armstrong was inspired and driven by Clark's writing. In the 1970's an entire sub-genre of science fiction sprang up around writers that aligned themselves closely with the "hard sciences" (e.g. computer science, astronomy, physics, chemistry, etc.). American science fiction author Alan Steele defines the sub-genre like this: "Hard SF is the form of imaginative literature that uses either established or carefully extrapolated science as its backbone."³ Many critics see hard sf as the only true science fiction because it is based on real science as opposed to the "soft sciences", pseudoscience or even science fantasy which concerns itself with notions of time travel, extrasensory powers and super heroes. Regardless of where you stand in this debate, it's clear that scientific research, theory and practice have a considerable and sometimes polarizing affect on science fiction.

The twenty-first century has brought us some fascinating explorations into the specific relationship between science fiction and actual technologies that are being built. Genevieve Bell and Paul Dourish in their paper "*Resistance is Futile*": *Reading Science Fiction and Ubiquitous Computing* argue that understanding science fiction, in their case popular British and American television shows like *Dr. Who* and *Star Trek*, is essential when designing these new technologies. They assert that science fiction can be employed as a tool for design. The futuristic visions expressed in sci-fi television shows can be used to understand the people's collective imagining of what future technologies might look like; thus allowing scientists to develop technologies and products that are easily understood but used by people. "Arguably, a range of contemporary technologies – from PDAs to cell phones – have adopted their forms and functions from science fiction. As in the famous case of British science fiction author Arthur C. Clark's speculative "invention" of the communications satellite, science fiction does not merely anticipate but actively shapes technological futures through its effect on the collective imagination. At the same time, science fiction in popular culture provides a context in which new technological developments are understood. Science fiction visions appear as prototypes for technological environments."⁴

Julian Bleeker expands this notion in his recent work *Design Fiction: A short essay on design, science, fact and fiction*. Bleeker sees the interplay between science

fiction and science fact as fertile ground for the inspiration and creations of physical prototypes. These design tools are both real and fake, operational and symbolic, serious and ironic. Bleecker describes them as a “conflation of design, science fact and science fiction...an amalgamation of practices that together bends the expectations as to what each does on its own and ties them together into something new.”⁵

Like Bleecker’s *Design Fictions*, science fiction prototypes like *Nebulous Mechanisms*, seek a productive middle ground between fact and fiction. They are a new lens through which emerging theories can be viewed differently, explored freely and ultimately developed further. Bleecker’s makes an excellent observation: “Productively confusing science fact and science fiction may be the only way for the science of fact to reach beyond itself and achieve more than incremental forms of innovation.”⁶ It is precisely this productive confusion and fusion of fact and fiction that can unlock, broaden and expand the boundaries of current scientific thinking.

2. A good SF story features, above all, a strong idea⁷

The approach to *Nebulous Mechanisms* and science fiction prototype stories is both as simple as a story well told and as complex as the scientific theory they are based on. When understanding the workings of the science fiction prototype it’s helpful to tease apart the workings of the short story itself to better understand how the experiment is conducted.

Alan Moore, author of *Watchmen* and *V for Vendetta*, does an efficient job of dissecting the story telling structure in his essay *Writing for Comics*. He describes the essential components of a story as plot, environment, characters and pacing, but central to every story there must be an idea. For Moore the idea is what the story is about, it is the reason for the story’s being, it is what drives all the other components. All the other components of the story serve to facilitate the central idea of the story.

Applying Moore’s example the idea of *Nebulous Mechanisms* is the theory laid out in the paper *Using Multiple Personas in Service Robots to Improve Exploration Strategies when Mapping new Environments*. But for the prototype to be successful we can’t stop at an engaging idea. The audience reading the story must accept the imagined future as real, plausible and acceptable. They must be drawn into the drama the story must hold the reader’s attention; maintaining an adequate level of suspension of disbelief. This level of disbelief can be used as a test of the validity of the prototype. Does the reader believe the world? Is the science invisible to the action and hidden in the cloak of the fiction?

Moore describes the necessary suspension of disbelief this way: “As I see it, a successful story of any kind should be almost like hypnosis: You fascinate the reader with your first sentence, draw them in further with your second sentence and have them in a mild trance by the third. Then, being careful not to wake them up, you carry them away up the back alleys of your narrative and when they are hopelessly lost within the story, having surrendered themselves to it, you do them terrible violence with a softball bat and then lead them whimpering to the exit on the last page. Believe me, they’ll

thank you for it. The important thing is that the reader should not wake up until you want them to...”⁸

The success of the experiment lies in the tenuous balance between the believability of the story and the exploration of the scientific theory. It is within these checks and balances that we can explore the beauty of the scientific theory wrapped in the drama of its real world realization.

3. Sometimes a Robot is just a Robot

Over the last fifty years most introductions to robot story anthologies will tell you that the age of robots is upon us. We are surrounded by robots that build our cars, pilot our planes, run our factories, run our elevators and even bomb our enemies. Actual robots have evolved beyond the “metal man” staple of science fiction and have become cyborgs, AI’s and any number of intelligent agents. Thomas M. Disch in the introduction to his essential examination of science fiction *The Dreams our Stuff is Made of* says that “the robot has been employed for a wide variety of dramatic purposes.”⁹ Ever since Karel Capek’s coining of the term robot in 1920 in his play *R.U.R* (Rossum’s Universal Robots) robots have been employed in a wide variety of dramatic purposes by science fiction authors. They have expressed our most terrible fears about the inequality of the class, race and gender. From this one would think that when you see a robot in any story then it must be a representation of something else. Who the robot is and what the robot does must mean something.

But there are some cases, as with *Nebulous Mechanisms*, that a robot is just meant to be a robot. In the beginning there were basically two types of robot stories. The first was based on the basic Faustian plot of Frankenstein. Scientist creates robot. Robot kills scientist. Pretty simple. Science legend Isaac Asimov at the beginning of his career recognized this standard Faustian approach. “...one of the stock plots of science fiction was that of the invention of a robot-usually pictured as a creature of metal, without soul or emotion. Under the influence of the well known deeds and ultimate fate of Frankenstein...there seemed to be only one change to be rung on this plot. Robots were created and destroyed their creator: robots were created and destroyed their creator; robots were created and destroyed their creator---”¹⁰

The second type of robot story emerged in America in the middle of the twentieth century. Sam Moskowitz in his introduction to *The Coming of the Robots* points out that “Psychologically the time was now ripe to launch an assault against the reader’s prejudices concerning robots.”¹¹ He goes on to describe two similar stories published within weeks of each other in 1938. *I, Robot* by Eando Binder which reverses the Frankenstein plot and *Helen O’Loy* by Lester Del Rey that presents a world where robots have progressed so far that they are indistinguishable from humans. In the story two friends, after ordering a mail order robot, find that the robot has fallen in love with one of the owners, Dave. It is both a uniquely prepubescent and poignant story. Helen O’Loy is described as “a dream in spun plastics and metals.”¹² Ultimately the unaging Helen cares for her love until he dies at one point putting lines on her face and graying her hair so her love thinks she’s aging with him.

I explored similar themes in my novel *Fake Plastic Love*, expanding Del Rey's concept of the lovely domestic robot into Ann-Mar, with the looks of the American film star Ann Margaret and the vocabulary of a gossip magazine. "She was a basic issue dream girl...her red synthetic hair looked perfect right out of the plastic. Her lips, too, were a perfect and permanent shade of lipstick red."¹³ Both robots are love interests and both are unabashedly robots, but whereas Helen strives to be human, Ann-Mar remains unmistakably a robot.

It is this point that is carried on in *Nebulous Mechanisms*. The robots in the story are realistic robots or at least realistic depictions of robots that strive to be no more than what they are. They do not aspire to partake in revenge killings of their Frankenstein masters nor do they strive to "pass" or become human. The robots of *Nebulous Mechanisms* are just that, robots.

4. How to Love Science Fiction

If you haven't guessed it already, I'll be honest with you; I do love science fiction. Two of my greatest affections are the intellectual rigor of scientific research and technology development as well as really good and challenging sci-fi story.

Science fiction is the playground of the intellect. Many people are mistaken when they think that the genre's aim is to predict the future. If this were true then the entire cannon of sf writing would have a terrible batting average. No, science fiction creates not just a single future but multiple futures; a wide variety of Earths and countless variations on humanity and technology. If you look back you'll see that science fiction writers have been going strong for nearly one hundred years. They have written about the space age both before and after it happened. They have dreamed about the canals of Mars and the realities of that fascinating red planet. All of this speculation and energy has produced an interesting affect on you and me. Andy Sawyer captures this affect in his essay *Tales of Futures Passed: The Kipling Continuum and other lost World of Science Fiction*. He writes: "We have read so many stories involving first voyages to the moon, lunar colonies and the exploration of space that we have now internalized a set of virtual histories of space travel and as a result, we cannot quite comprehend that in fact this has not happened."¹⁴

These futures that Sawyer describes are lodged in our collective and cultural history. The future and science fiction have mingled together in our education and imaginations to such a point that there is no better medium to use as a platform for fictional prototyping. Science fiction prototypes allow us to create multiple worlds and a wide variety of futures so that we may study and explore the intricacies of modern science. They are a powerful tool meant to enhance the traditional practices of research and design. The discoveries that we make with these prototypes can be used to question and explore current thinking on a level we have not approached in the past; namely using multiple futures and realities to test the implications and intricacies of theory. Additionally the output of the science fiction prototype can inform a technology's consumer experience architecture, investigating and shaping how a user might encounter, explore and ultimately use that technology. Science fiction allows us

to see ourselves in a new light, in the light of a new future; one that is not our own but reflects directly upon who we are and where we might be headed. The science fiction prototype brings this same lens to science fact; allows us to see the multiple futures in the theory we are constructing today.

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