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Snow Crash: Concept and Prop Design for the Entertainment Industry

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SNOW CRASH
concept & prop design
for the entertainment industry

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Fine Arts in Industrial Design

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TABLE OF CONTENTS

ABSTRACT

PROBLEM STATEMENT

INTRODUCTION

RESEARCH
   - Entertainment Industry
   - Science Fiction in Pop Culture
   - Science Fiction and Modern Technology
   - Snow Crash as an inspiration for design

PRODUCTION
   - Goals
   - Concept Selection
   - Methods and Techniques
   - Production Pipeline

   Cosa Nostra Delivery Vehicle
   Cosa Nostra Pick-Up Docks
   Gargoyle Goggles
   Cosa Nostra “Pizza Cutter”
   Electromagnetic Harpoon

FICTIONAL CORPORATE BRANDING

ESTABLISHING ENVIRONMENT SHOT

CONCLUSION
   - Moving Forward
   - Further Concept Development
ABSTRACT

Snow Crash was written by Neal Stephenson and published in 1992. The novel touches upon the topics of technology, information, computer science, and philosophy. The main character, appropriately named Hiro Protagonist delivers pizza for Uncle Enzo's Cosa Nostra Pizza Inc., but in the Metaverse (Virtual Reality Network) he's a katana wielding warrior. Hiro gets involved with the enigma of a new computer virus that's infecting hackers everywhere. He navigates the neon-lit streets with a mission of locating and neutralizing a new villain who is trying to bring forth the Infocalypse.

Neal Stephenson paints a vivid world filled with astonishing multifaceted characters, diverse city states and uncanny descriptions of future technology and global networking. For instance a Google Earth-like system was described in great detail with remarkably similar functionality to that common piece of software we use to find directions, discover new places and enjoy high resolution aerial images. Snow Crash also addresses the issues of linguistics, history, religion as well as politics, which are tremendously interesting and compelling, however not as suited to my direction in this particular project.

For the purposes of my industrial design thesis I had focused on the development of the technology that was described in the novel. Neal Stephenson provides rather detailed function and use scenarios of these systems in the book. I chose to focus on certain items described in greater detail since they would hold a great amount of viewer interest in either a feature film or a video game, while maintaining a style and visual aspects a modern consumer of entertainment expects.
When the Deliverator puts the hammer down, shit happens. You want to talk contact patches? Your car's tires have tiny contact patches, talk to the asphalt in four places the size of your tongue. The Deliverator’s car has big sticky tires with contact patches the size of a fat lady's thigh” Neal Stephenson. “Snow Crash.” 1992. This excerpt talks about a pizza delivery vehicle operated by the main character. Vivid descriptions like this one made my job as a designer relatively easy since not only did I get the general aesthetic direction but also some indication of the emotion that the product evokes.
PROBLEM STATEMENT

Interpretation, design, and modeling of *Snow Crash* equipment, machinery and environments with the purpose of visualization intended for the entertainment industry while utilizing iterative process as well as design theories and practices.

This goal kept me invested in applying the industrial design process to fictional equipment. Within the context of modern entertainment where the consumer expects high quality production as well as some degree of believability, the designer must treat fictional technology, environments and characters as if they had some chance of existing in our reality.

Providing common point of reference, or in other words some hints of tangible that we find in our everyday lives creates immersion and relation to what is happening on the screen.

“Keeping the player invested and finding those keys to keeping him or her immersed is our goal. “ - Kenneth Scott, Senior Art Director at 343 Industries, a studio that brought us HALO.
INTRODUCTION

“Science fiction is the most important literature in the history of the world, because it's the history of ideas, the history of our civilization birthing itself.” - Ray Bradbury

When discussing science fiction and our current technological state this quote perhaps says it best. Neal Stephenson’s *Snow Crash* stands on the cusp of science fiction and science fact. Technologies and the world described in the book are templates by which modern systems are sometimes inspired. Although at times gloomy and apocalyptic these ideas are ripe full of interpretation and development in both entertainment and real world applications. Products like Oculus Rift, Google Glass and Earth as well as the internet have striking similarities with the tech described in the book. This is why this science fiction work is well suited for conceptual development for a game or a film, since we already established technological points of reference.

The world described in *Snow Crash* is vast, however the technology described held my interest. I was constantly referencing modern inventions as well as systems and tried to visualize them in use. This presented an interesting challenge, since I was interpreting technology presented in the book and trying to add modern science fiction aesthetic that the consumer expects.

I was looking towards modern science fiction in games and films, due to their striking visuals and conceptual development. Films Like *District 9, Elysium* and game titles like *Unreal Tournament* and *Halo* inspired my the most, since they showcase systems and environments that are not entirely implausible.
RESEARCH

SCIENCE FICTION IN POP CULTURE

In addition to the descriptions in the book, I was looking to the entertainment industry in general as well as current technologies and systems to inform my design process. Books, films, concept art, and games were a big part of the research process; as they tend to reflect the current science fiction trends and provide a benchmarks for the design and aesthetic.

Science fiction entertainment, like feature films and games, bring a huge amount of revenue. For instance, according to Gamespot (Gaming news site), Halo since its first launch in 2001 has sold 50 million copies. The latest title from Bungie Studios, Halo 4, generated $220 million in the first 24 hours on the consumer market.

The success of the title can be attributed to great gameplay, online multiplayer matches, but most importantly the design of the whole experience. The latest addition to the franchise, Halo 4, has stunning visuals including environments, vehicles, characters and of course a massive arsenal of weapons.

Such visual richness and variety has to be attributed to great designers such as Nicholas “Sparth” Bouvier, Kenneth Scott, John Wallin Liberto and others. In my research I tried to emulate the style of the design process, which I will address in greater detail further in the paper.
Snow Crash itself contains a mass of information about fictional tools and devices which are described in great detail. What struck me the most is the author’s understanding of technology and physics that let him extrapolate fantastic scenarios and environments to which the reader can relate and visualize.

Neal Stephenson managed to research, understand and collect all applicable technologies and concepts of the time and build an educated guess about the state of future of the web, transportation and wearable computing.

If executed properly science fiction has a way to tap into one’s dreams, hopes and nightmares. The famous radio broadcast of H.G. Wells’ novel War of The Worlds on October 30, 1938 proved how much people are willing to believe in beautifully constructed science fiction.

Although this broadcast resulted in widespread panic, it illustrates a greater truth, where a consumer of entertainment is willing to suspend disbelief in order to be transported into alternate worlds.

At this point in time escapism takes on a form of films, games or any other form of high fidelity distraction. In these avenues of entertainment high quality, believable design is a key to success. Movies like Blade Runner and 2001 A Space Odyssey exemplify that a combination of a great novel combined with exceptional reality based design can lead to a wonderful entertainment experience.
SCIENCE FICTION AND MODERN TECHNOLOGY

Science fiction is a great barometer of the culture and civilization of a given time. Although concepts and ideas maybe far fetched, there are always elements that have to reflect or satirize the state of technology or society at a given time. Although our heroes may be traveling to a distant star they still communicate through wired communication terminals. Such is the paradox of sci-fi entertainment in the retrospect. As a designer, the best I can do is to collect all applicable information and make the best educated guess possible.

Current technological landscape is filled with technology that only recently was considered an impossibility. Reading and designing artifacts from “Snow Crash” makes one realize how far we have come technologically and how far we still have to go.

The “Gargoyle” is one of these outstanding glimpses into the future of computing that we are witnessing today.

“Instead of using laptops, they wear their computers on their bodies, broken up into separate modules that hang on the waist, on the back, on the headset.” (“Snow Crash” p.212)

“…you can be in the Metaverse all the time, and gather intelligence all the time.” (“Snow Crash” p. 213)

Neal Stephenson describes in great accuracy and detail the technology that is coming into the market today, namely Oculus Rift and Google Glass.
Oculus Rift, a virtual reality low latency video headset.

Stereo 3D image shown over each eye to create an illusion of depth on the Oculus Rift.
I tested this product at CES 2014, and was stunned by its ability to transport the user into a different environment with a great deal of realism and accurate motion tracking. Oculus Rift has an uncanny similarity to the Virtual Reality goggles in described “Snow Crash”

“By drawing a slightly different image in front of each eye, the image can be made three-dimensional. By changing the image seventy-two times a second, it can be made to move. By drawing the moving three-dimensional image at a resolution of 2K pixels on a side, it can be as sharp as the eye can perceive, and by pumping stereo digital sound through the little earphones, the moving 3-D pictures can have a perfectly realistic soundtrack.” (“Snow Crash.” p.44)

Technology like this was a big inspiration for my interpretation of Gargoyle goggles, since it is the blending what was considered science fiction with modern product development. Another interesting application for the augmentation of reality is navigation, which is starting to appear in augmented reality headwear, like Google Glass. Once again, Stephenson managed to visualize such application prior to 1992.

“…on a heads-up display, a glowing colored map traced out against the windshield so that the Deliverator does not even have to glance down.” (“Snow Crash” p. 14)
These examples present a solid case for science fiction creating appealing ideas that later on become a reality by capturing the imaginations of scientists and designers.

During my design process I was attempting to draw from the novel itself as well as the latest breakthroughs in modern technologies, to make the best educated guess about how my interpretations would work and look.
SNOW CRASH AS AN INSPIRATION FOR DESIGN

Neal Stephenson paints a dark dystopian world, where the United States has broken up into a myriad of franchised city states. Between the multitude of clashing factions and corporations the protagonists Hiro and YT navigate their dangerous surroundings with the latest gear in their possession. Many of the action scenes describe dark neon illuminated streets and avenues, dilapidated suburbs, and makeshift housing within a storage unit. This quote describes the mood of the environment quite well, as the Protagonist makes a delivery:

*His car is an invisible black lozenge, just a dark place that reflects the tunnel of franchise signs—the loglo. A row of orange lights burbles and churns across the front, where the grille would be if this were an air-breathing car. The orange light looks like a gasoline fire. It comes in through people's rear windows, bounces off their rearview mirrors, projects a fiery mask across their eyes, reaches into their subconscious, and unearths terrible fears of being pinned, fully conscious, under a detonating gas tank, makes them want to pull over and let the Deliverator overtake them in his black chariot of pepperoni fire.* (Snow Crash p. 18)

*“The room has a concrete slab floor, corrugated steel walls separating it from the neighboring units, and—this is a mark of distinction and luxury—a roll-up steel door that faces northwest, giving them a few red rays at times like this, when the sun is setting over LAX.”* (Snow Crash p. 38)

*“Downtown is a dozen Manhattans, embroidered with neon and stacked on top of each other.”* (Snow Crash p. 49)
Such vivid descriptions helped me conceptualize the general mood of the designs that are required to make a believable world such as this. Weapons, vehicles and environments had to behave like they were designed to survive and protect, as well as preform, in this post apocalyptic city. This was one the challenges of the design process.

Early Cosa Nostra Delivery vehicle concept.
GOALS

**Conceptualization and Development** of select products and system in *Snow Crash* with emphasis on believability while maintaining connection with the descriptions provided in the novel. Certain elements were slightly altered to increase entertainment value of the products.

CONCEPT SELECTION

*Snow Crash* is full of spectacular concepts and systems. I have chosen a group of concepts that have a degree of novelty as well as the potential for the design process based on the description provided in the novel. I chose to focus on wearable technologies as well as transportation and environment design.

- **Cosa Nostra Delivery vehicle**
- **Gargoyle Goggles**
- **Electromagnetic Harpoon**
- **Cosa Nostra “Pizza Cutter”**
- **Establishing Environment Shot**
METHODS AND TECHNIQUES

The visual development of the concepts above was achieved through utilization of sketching, both 2D and 3D, software packages like Adobe Photoshop and Illustrator, Autodesk Maya, Rhinoceros and Keyshot. The combination of these various software packages allowed me to streamline my process by helping me in the establishment of basic lighting and perspective.

PRODUCTION PIPELINE

The key benefit of combining 2D and 3D software is rapid visualization of forms and design variations. In the beginning of the design process a basic Maya model is created. This rough model usually follows some vague design spec or a basic sketch. At this point a designer can start experimenting with the form and potential function. For instance, if the vehicle is the target concept, a designer would create a simple chassis as well as the general form. Subsequently, basic lighting and shadows are added so the form reads a bit better. One of the biggest benefits of utilizing Maya for this model is its interactive lighting and perspective visualization. Optimal lighting and perspective will aid the designer. A background shader is added to the ground plane in order to preserve the object shadow without the background in the image. The rendering is generally done with production quality setting and is exported as a PNG. The image is then imported into Adobe Photoshop and is duplicated a number of times. At this
point Adobe Photoshop can be used to create quick form variations as well as a variety of aesthetic directions. Image below shows how a 3D model is painted over in Photoshop to quickly generate ideas.

Adobe Photoshop Paint-over.

Video Demonstration @ http://bit.ly/1dkVWk7
COSA NOSTRA DELIVERY VEHICLE

Cosa Nostra delivery vehicles have to navigate a variety of terrains and environments through the politically and socially fragmented world while delivering pizza in 30 minutes or less. The precious cargo is automatically loaded in the back of the vehicle by an automated loading dock. Vehicle’s 6 electric motors drive each wheel independently through an unforgiving terrain while providing environmentally friendly 600hp and great traction. Heavy armor plating protects the deliberator (Pizza delivery specialist) from a variety of ammunitions types. Camera and sensor array insures that the driver is hyperaware of the surroundings even without windows. All of the road info as well as maps and the destination is shown on a curved panoramic OLED display inside the cockpit.

DESIGN PROCESS
With the design direction figured out, I proceeded to create a model page displaying various views of the vehicle. This way a potential client will have an extensive understanding of a model before further rendering and refinement.
I envisioned this delivery car as a heavily armored tactical vehicle, since the environments it navigates are somewhat dangerous and chaotic. The retractible roof is bulletproof and has a rugged appearance. The vehicle is driven by 6 electric motors in the wheels. This system is inspired by the Michelin Active Wheel, a mechanism that houses electric motors, suspension and steering directly in the wheel.
This vehicle is designed to back in into a designated space where an automatic chute loads the pizza in the rear. I envisioned these docks as designated parking spots with an automated chute designed to link up perfectly with the delivery vehicle.
No other Deliverators are waiting in the chute. That is good, that means high turnover for him, fast action, keep moving that 'za. As he scrunches to a stop, the electromechanical hatch on the flank of his car is already opening” (Snow Crash p. 20-21).
“GARGOYLE” VIRTUAL REALITY GOGGLES

“Gargoyle” is an individual who is working for the Central Intelligence Corporation. Gargoyles are very easy to spot since they are outfitted with a wearable computer that is constantly collecting and processing information. This device has the capability to tap into the metaverse (a virtual reality network) as well as seamlessly switch into augmented reality to provide the operator with a variety of information.

As I was designing the aesthetic of this system I was envisioning a ruggedized Oculus rift, with optics and cameras that actually allow the wearer to see the environment with a variety of augmentation options.

“...seeing everything in visual light, infrared, millimeter-wave radar, and ultrasound all at once.” (“Snow Crash” p. 200)

Initial Sketches
Modeling Stage

The Gargoyle goggles were an project in terms of production. My goal from the beginning was to design, model and 3D print this object. Modeling provides a relatively accurate visual approximation, however realizing the object via 3D printing allows the designer to test the form, ergonomics and conduct user testing and get feedback.

3D Print

Light, power supply and strap addition
3D Approximation of how the device might appear in a film or a game along with the part and function description.
3D Approximation of how the device might appear in a film or a game.
COSA NOSTRA “PIZZA CUTTER”

This device was my own attempt to increase the arsenal of the pizza delivery crew.

“Pizza Cutter” is a nickname for a wearable electric chainsaw commonly used by Cosa Nostra delivery crew for defense as well as clearing obstacles such as debris and fences along the delivery route. Due to the weight of the device it can also be operated by two hands with the help of an external ergonomic handle. Anti vibration suspension reduces user fatigue and improves comfort while built in hand guards reduce the risk of injury. The Omnilube lubrication system improves the efficiency of cutting, though any lubricant available works, including garlic butter.

“PIZZA CUTTER” Early Sketch

“PIZZA CUTTER” Photoshop Sketch
SNOW CRASH concept and prop design for the entertainment industry
RadiKS ELECTROMAGNETIC HARPOON

“She is holding her “poon” in her right hand, the electromagnet reeled up against the handle so it looks like some kind of a strange wide-angle intergalactic death ray.” (“Snow Crash” p. 34)

“It is a big round padded electromagnet on the end of an arachnofiber cable. It has just thunked onto the back of the Deliverator’s car, and stuck. Ten feet behind him, the owner of this cursed device is surfing, taking him for a ride, skateboarding along like a water skier behind a boat.” (“Snow Crash” p. 29)

This particular device as described in the book truly fascinated me. Here is, for a lack of a better word, a weapon. A device which allows the user to hitch a ride behind a vehicle with the help of powerful superconducting magnets. The two quotes above provide a good description about the weapon’s use and general appearance, however it was not enough for me to produce a cohesive design. I had interpreted the devise as a pistol-handled, magnetic plate launcher. Early sketches below show how the device would be held.
When developing the aesthetic, I started to conceptualize a harpoon that latches onto a moving vehicle and would provide a user with additional information about the environment and the moving targets. A built-in radar and display provides the user with all the information collected.

A large cylinder in the rear of the device is a spool that contains the *arachnofiber* cable. The emergency release button behind the spool unit allows that wearer to disable the magnetic plates, in order to separate from the vehicle in the front.

Ideation, and exploration of forms and uses.
In order to better understand the form and functionality of the device I proceeded to build a 3D model of the object based on the design direction established in the 2D renderings.

In the modeling process I discovered that my original 2D rendering did not address the ergonomics of the handle and the trigger mechanism. In other words the user would not have enough knuckle room.
Build of the handle and the frame in Rhino

Body design in Maya
The 3D modeling of the electromagnetic harpoon allowed me to explore the device in greater detail and understand the functionality nuances and general mechanics.

Keyshot Rendering
FICTIONAL BRANDING

The world of the novel is filled with corporations, products and advertising. I was tempted to explore a few of those corporate identities to give my designs more context and a sense of realism. One of the first brands I undertook was the COSA NOSTRA pizza.

This mafia operated corporation specializes in speedy pizza delivery in 30 minutes or less. I wanted the logo to be recognizable and legible, reflecting the company’s no nonsense way of conducting business. I used a bold sans serif type face to reflect the organization’s stern nature. A three color option of the logo reflects the Italian origins of COSA NOSTRA pizza. The logo mark is located in the right and depicts a stylized pepperoni pizza.
Another instance of Cosa Nostra advertising is a billboard showing Uncle Enzo (Cosa Nostra boss) in his fine suit.
U STOR STORAGE UNIT BRANDING

The storage company makes a number of appearances in the novel, namely in the descriptions of Protagonist’s living arrangement. These storage units are usually adapted into makeshift apartments.

Utilitarian and minimalistic nature of the company is reflected in hazard striping and blocky type.

Neon sign in front of the U.STOR storage units.
RadiKS KOURIER SERVICES

Without a doubt this organization comes off as an underground punk-like delivery service that employs skateboarders that harpoon the traffic and hitch a ride. Author describes that the logo has a “cybernetic radish” (*Snow Crash p. 300*).

I stylized the radish top and placed it sideways in front of the word mark. The chunky italicized typeface used in the logo reflects the organization’s dynamic nature.
ESTABLISHING ENVIRONMENT SHOT

The vast world described by Stephenson is highly diverse and is fragmented by a number of franchised city states with multiple socio-economic classes. The environment I attempted to design shows that vast valley between classes. U.STOR makeshift apartments frame the shot and in the distance we can see the glimmering lights of the big city.

When designing the makeshift slum housing, it was important to consider the alterations that residents would make, since existing structures were not intended for residential purposes. Large power relays were installed after the fact to satisfy power hungry residences. The units are linked together by gathered wiring.
The U.STOR units have patio add-ons made from gathered corrugated steel and aluminum panels. The disenfranchised residents have tagged their surroundings with graffiti and street art. These elements combined with cold neon lighting creates a cold, unwelcoming dystopian environment that Neal Stephenson describes in *Snow Crash*.

The reason I decided to include this image was to indicate the potential environment for the products, vehicles and advertisements I designed. This image is meant to be a starting point for the development of the larger world with a variety of locations.
CONCLUSION

MOVING FORWARD

The novel of such depth provides opportunities for further design and concept creation. The technology along with the detailed descriptions given along side of it, warrants more products, more user scenarios and more cohesive designs.

I proceeded to work with the technologies that present a degree of novelty and complexity. The tactical pizza delivery machine is a great example of that novelty. Stephenson took aspects of the existing social trends and technology and postulated how they all might evolve.

Interpreting these ideas and systems twenty two years after the novel was published gave me an interesting vantage point on the designs, since many technologies described in the book are already reality or are close to becoming mainstream. Augmented reality platforms like Google Glass and Oculus Rift are on the fast track to the mass market.

Trends in the entertainment industry demand a degree of plausible functionality since the consumer is familiar or already uses certain advanced systems. Making something look “sci-fi” is not enough in current entertainment context. Films and games have shown that designers have to develop products that appear to have a realistic functionality and appearance. Film Elysium 2013 shows how futuristic design can be intelligently informed by experimental technology of today. The exoskeleton worn by the protagonist of the film is reminiscent of HULC (Human Universal Load Carrier) exoskeleton that is being developed by Berkley Bionics.
As the entertainment industry plainly shows, the design of a fictional piece of tech has to have a root in reality and the designer has to have a degree of understanding of the system that is inspiring that design. As I continue the work of this project, I will attempt to inform my design by researching the applicable technologies and products to produce well-rounded concepts.

**FURTHER CONCEPT DEVELOPMENT**

I consider the designs produced thus far as templates for further development and refinement. The nature of this project will allow me to explore a number of avenues within design, from product development to data visualization.

RadiKS Smartwheel MK II, is one product that I wish to interpret and visually demonstrate. “*Each spoke telescopes in five sections. On the end is a squat foot, rubber tread on the bottom, swiveling on a ball joint. As the wheels roll, the feet plant themselves one at a time, almost glomming into one continuous tire. If you surf over a bump, the spokes retract to pass over it.*” *(Snow Crash p. 53).*

The quote above describes the functionality of this skateboard wheel. It would be interesting to explore how a technology like this might actually work and look. Resilient Technologies and Wisconsin- Madison’s Polymer Center are in the process of developing a non-pneumatic tire, which utilizes a mesh of hexagonal cells to absorb shocks.

The physical world of *Snow Crash* has a certain aesthetic and gloomy undertones, while the Metaverse (Virtual Reality Network) opens up possibilities not limited by laws of physics, therefore I will be able to explore space and form in a new unconstrained way with a whole new design language.
From the standpoint of a designer, *Snow Crash* is a great tool for inspiration, exploration and concept development. During this process I developed new methods of production, design aesthetic and gained control over new tools. This novel, as an inspiration of my thesis, allowed me to practice the iterative design process and problem solving that is applicable in production of real products as well as science fiction technologies and environments.
WORKS CITED


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SNOW CRASH concept and prop design for the entertainment industry