The Report Committee for Deepak Joshua Chetty
Certifies that this is the approved version of the following Report:

Soft Reboot: The Making of Hard Reset

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor: Donald Howard

Benjamin Bays

Caroline Fricke

Soft Reboot: The Making of *Hard Reset*

by

Deepak Joshua Chetty, BFA

Report

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Dedication

To AC, GS, ES, PC and HBGC.

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Abstract

Soft Reboot: The Making of *Hard Reset*

Deepak Joshua Chetty, MFA
The University of Texas at Austin, 2015

Supervisor: Don Howard

Director, Writer and MFA Candidate Deepak Joshua Chetty will discuss his history as a filmmaker from an early age up until present day as well as the entire process of conceptualizing, creating, producing and finishing *Hard Reset. Hard Reset,* a science fiction thriller is the first short film out of UT3D and the first graduate thesis film shot natively in stereoscopic 3D in North America.

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Chapter 1: Evolution

Challenge yourself. Two words. Those exact two words were spoken (separately) to me by my parents when I told them I would be quitting my quasi successful run as a freelancer in New York City to make the move to Austin, Texas for an MFA in Film and Video Production at UT. While my mother's tone was with her usual melodic lilt that is sincere and reassuring, my fathers was direct and clear. I could tell he was concerned which in turn concerned me. Never once in my life did either of my parents or anyone in my immediate family question my decision to enter into the arts as opposed to the more practical fields (traditionally speaking) of science and medicine that fill out most of the occupations in my family tree. They have always been supportive of my creative aspirations, never once trying to dissuade me from my chosen path.

I think they'd been that way because I had been sort of lucky since receiving my BFA in Film and Video production from Pratt Institute in Brooklyn. I was living in New York quite comfortably and pulling in work without worry. To them, I was on a path to success- they would try to quantify it as such. So to hear that I was deciding to take three years (which has turned into five) away from steady career work to focus on my Masters, they were a bit perplexed. The only way I could explain it to them was to say that I was tired of working for other people and I needed a change of creative pace.

I understand their confusion and perhaps their concern. What I want to do is so different from what they have spent most of their lives doing. There is absolutely no point of comparison. Career wise I exist in a world that is utterly alien to them. When describing a typical day on set or what it's like to work as a cinematographer or how I spent that one week rotoscoping boom mic reflections off cars I can sense the lack of understanding. My father in his own blunt way of speaking has told me me to put things into perspective when I would complain about being stressed out over a film or any other creative pursuit. "You're not saving lives." Says the emergency room anesthesiologist. "You're living a dream, doing what you love." Most of all I believe that they do not like

to think that they can never really offer any sort of insight into what I do. If I had taken a career path similar to theirs they would at least be able to relate and understand. To hear the concern in my fathers voice, for the first time ever was a shock. It was also the best motivator.

My parents divorced when I was about two years old which left my mother and I in Tulsa, Oklahoma while my dad moved exactly(!) one hundred miles away to Oklahoma City. Both of my parents worked non-stop so I found myself drawn to escapist fiction in a way that helped pass the time and keep me occupied. I loved living vicariously through film and television and airport paperbacks. The more fantastical and heart-pounding the better, I craved the sense of adventure and excitement only a perfectly produced studio film or white knuckle page turner could deliver. When I was in middle school my heroes were Ellen Ripley[v], Alan Grant[vi] and Marty McFly[vii]. Sure I had Air Jordans like the rest of my friends, but I also had an orange vest like Marty. I was way more fond of the latter.

By the time I was ten I had taken a serious interest into actual film-making as opposed to film watching. I swapped super-soakers for an S-VHS camera. I swapped comics for books on Spielberg and Scorsese, Verhoeven and Kurosawa. Seeing as I couldn't find an actual bio at the time- I would track down any sort of article or interview I could read about James Cameron. Film directors and special effects wizards like Stan Winston, Dennis Muren and Douglas Trumbull were my superheroes.

When I started making films at that age I never used any friends as actors. I used toys and was fond of creating stop motion action extravaganzas filled with cotton puffs for smoke and play-doh strings for gore. A Lego Man has an unfortunate encounter with *Jurassic Park's* T-Rex? Did it. Ninja Turtles Versus and Xenomorph from *Aliens*- did that one too. It was only by the time I was in sixth grade that I started to put, you know,

v*Alien, Dir. Scott, Aliens, Dir. Cameron*
vi*Jurassic Park, Dir. Spielberg,*
Crichton, Michael.. *Jurassic Park*
vii*Back to The Future Parts I,II & III, Dir. Zemeckis*

actual people in front of the camera. My love affair with the idea of my actors as literal props was came to an end when my friends all started asking why I didn't ever film them doing *"cool stuff"*.

I continued to make short films throughout high school always leaning towards more action oriented fare. Around the time I was in eleventh grade I grew obsessed with the blood, brotherhood and bullet ballets of John Woo which was most of his output from the mid-eighties to early nineties. At the time besides Kurosawa, Woo was the only other Asian filmmaker I was really well versed in. I had not yet dipped into Korean cinema, or Bollywood Film. I embraced the notion of melodrama found in Woo's films and was often making crazy shorts with my friends that always started with some ridiculous action concept and would end with a laughably heartfelt conversation between two foes. I was lucky to grow up with a bunch of like minded kids in Tulsa, by the time we were seniors in high school works of ours had screened across the city and we had traveled to Festivals across North America with a few of our crazy films. If it had not been for my friends who also shared the same interest in film (and have gone on to work in the industry as well) I might not have felt as confident going into undergraduate film school in regards to my capability as a filmmaker.

That initial confidence gained from years of amateur film-making while in Tulsa were pretty quickly squashed during my first year at Pratt Institute. I was initially disappointed that "film school" wasn't all I thought it would be. The first two semesters were slow, projects felt too basic and I kept wondering if I was just wasting my time. I wasn't "making" anything. I was following bullet points on a syllabus without any sort of challenge. I'm not sure why I never considered that an art school like Pratt might not have been the best choice for a more narratively concerned filmmaker like myself. I yearned to express myself through the type of film-making I had grown up with and emulated over prior years.

In the meanwhile I ended up more interested if my non-film classes. What Pratt

calls the “Foundation”: Drawing One, Light, Color and Design and Art History were my favorites. I especially enjoyed Light, Color and Design as it was a thrillingly technical and scientific approach to color theory across all art mediums. Lessons I learned in that class are applied to almost every facet of my work as a visual artist to this day.

I appreciated Drawing One because it taught me more about the artist as an individual than any other class prior to or after. I learned and mused on the notion of how each stroke of the pencil or charcoal was an individual imprint, and through practice and well developed skill those simple lines could turn one’s own cultivated style into an *identity*. Art History was important because it introduced me to the two most influential figures outside of film-making on my artistic growth. What I learned from studying the paintings of Caravaggio and Turner have directly influenced the type of visual filmmaker I am today.

By the time I was a junior at Pratt I felt like I had finally established my artistic method and style. Looking back to those great creators that had initially inspired me, I began studying visual effects on my own. I learned After Effects through a series of video tutorials on painfully slow dial up internet. I began to start making more ambitious and varied content. I was no longer limited to the streets of New York City (although, I can’t say being able to film in the greatest city in the world is exactly “limiting”). Somehow I wanted to go bigger and bolder. I decided for my pre-thesis film at Pratt that I would create a throwback to the black and white adventure serials of the 30’s and 40’s. I would shoot the film entirely against a green screen, absolutely no sets. I would composite the actors into a long lost jungle paradise on…. *The Curse of Dracula Island*. Think *King Kong* meets Bram Stoker meets some guy wearing a fedora whose barrel chest is showing through his ripped khaki shirt, holding a Thompson machine gun you saw on the cover of a pulp novel on the spinnable dollar rack of your nearest book store.

I wrote the script, cast my friends (no barrel chested, lantern jawed men were available), created the costumes and props and started planning out the shoot. I created

tiny miniature models that would be used as the jungle sets which would then be composited into the live action. We filmed over the period of a week, shooting in one of the tiny Pratt studios in between classes whenever I could gather the group of us. The green screen was a set of lime green sheets purchased from the Target on Atlantic Avenue held up by a PVC frame put together from the local home depot. It was truly scrappy film-making, and at the time was the most fun I had ever had. Earlier that semester in my Film History course we had watched quite a few short adventure serials and I studied how they were constructed on a technical level regarding the camera placement and editing style. We filmed completely locked off on a tripod to emulate a strict proscenium. As little as there was, all the camera movement was done in post in an effort to recreate optical screen movements done long ago. It took me four months of post to finish what was a seventeen minute short. Along the way I fortified my knowledge of compositing and keyframe animation as well as basic sound design.

After the project was completed I was exhilarated, I had taken a somewhat calculated risk and it had paid off. That year I was Pratt's nomination for the Princess Grace Award and won the departments only scholarship[viii] based off a body of work due to *The Curse of Dracula Island*.

It was encouraging to have completed the film and to have gotten a good response. I told myself after that that I was never going to play it safe, I'm going to take chances. Succeed or fail, I'd always be happy that I took the plunge. You trip up and you learn from it and move on to the next thing. What I love about being a filmmaker is that the game is always changing. We live in a world where fifteen years ago if you said you were a filmmaker most people might not have ever met someone who would describe themselves as such. These days anyone with an iPhone can call themselves a filmmaker. There's nothing wrong with that, but the fact that this artistic identity is becoming super saturated is what drives me into creating things that are unique and not entirely universal in their possibility. I love that I am always kept on my toes by developments in new

viiiThe Steve and Linda Horn Media Arts Scholarship

technology or evolutionary cycles of the way in which narrative media is presented. Just in the last decade we've seen the rise of long form narrative storytelling on television and online venues such as Netflix and Hulu. A whole new avenue of possible narrative content has been opened up by the increasing quality of interactive narrative experiences seen in video games and interactive art.

While the market is become more saturated with content and content producers there has never been a time in which there were so many varied ways to call one's self a filmmaker or for that matter a storyteller. What drives me is the idea that we live in a time where through film telling any type of story through moving pictures is a possibility. Will it succeed? That is another question. But the sky is no longer the limit.

Now we come back to those two words. "Challenge yourself". My wife (then girlfriend) and I packed all of our belongings into our car and left our cozy railroad apartment in Greenpoint, Brooklyn. Headed south by southwest towards Texas those words kept echoing within my head.

Hard Reset, my thesis film, is a culmination of all the creative energy that has been building since I started making films as a child. Except now I've traded out the S-VHS and Hi-8 cameras for two RED Epics and a Pulsar stereoscopic beam-splitter rig. Talk about evolution. It so far has been the most difficult yet rewarding creative experience of my life, a journey that from start to finish has lasted almost exactly two years. It is the ultimate response to those simple words spoken by my mother and father.

Chapter 2: An Idea Conceived In a Daydream

August 2012, Austin. Texas

I'm drifting off to sleep on the couch, I've been up the past few nights working on a freelance motion graphic gig for a local tech startup and it has me seeing visions of the future. The last four days have been flashy holographic looking user interfaces, matrices of data and photoshopped pictures of attractive businessmen and women decked in bizarrely retro wearable technology. Working many overnights in a row has my head spinning and I'm starting to get delirious. I'm dozing in and out of sleepy visions of polygonal metropolises with mile high tenements. The sun is always so bright in this world, blinding everyone with a golden sideways glare – permanent magic hour. While I'm lost in my own head the TV is droning across the room. I begin switching channels without prejudice when I land upon a weird news report of a robot that has been developed in Japan. Her locomotion is only one step beyond what you'd see at one of those coin-op strewn pizza places that has the anthropomorphic animals playing the banjo and singing through tinny speakers. *Her* locomotion. What catches me off guard, in the middle of this delirious siesta is that it is not an *it*, it is a *her*.

While the chassis is what we'd consider to be a "robot", the face is different. It is flesh colored, youthful and seems to glow. The way the light hits the skin and scatters is eerily similar to a real human being. It's unnatural, immediately I am almost offended that her creators have deigned to present such an appealing face unto their creation- to what end?

Suddenly I have a thought, a very irrational and nonsensical thought. What if my future child falls in love with a robot? The doorbell rings and I answer, my imaginary daughter is smiling wide as the door opens. Next to her is a being. Human…looking. He nods courteously and offers a metal hand that is slightly warm to the touch. This is unnerving. "Dad," she says – "this is my boyfriend". Guess who's coming to dinner? A robot.

The genesis of the idea for Hard Reset came to me that afternoon. I spent the day on the couch imagining a society where human and non-human humanoid relations were common, not unexpected. It was interesting but I struggled with finding a universal conflict in that setting which could manifest in a way not too commonly seen in science fiction. Many initial ideas seemed too much like a teenage boys fantasy ripped out of the pages of some French comic book. Beyond the juvenile sort of thoughts and fantasies that could fill a truckload of vintage sci-fi paperbacks I wanted to find a conflict that spoke to something potentially larger, more universal. What sort of problems would exist in a world where non-human humanoids were a part of our lives? A world in which they are involved in every part of our society, but not allowed to experience it. For a short film I decided that I would focus on one single synthetic humanoid. I would tell her story. This being decided, I would spend the next couple of months ruminating over the concept before finding a collaborator to write the screenplay.

Chapter 3: Developing The Script

The first draft of the script for Hard Reset was written between December 2012 and January 2013. Around October 2012 I met with an undergrad named David Bukstein who had seen my previous work and was wanting to collaborate on a project, my thesis perhaps. He introduced himself as a "creative producer" who likes to be involved in the writing stage of a films development. Over a beer at Hole in the Wall, I pitched him and very abbreviated version of what was to become Hard Reset. He started laughing halfway through my pitch, I was worried that I'd made some sort of unintentional joke. David, *this isn't a comedy*- I almost said.

As it turns out he was laughing because he had been developing a very similar idea to mine in regards to synthetic humanoid freedom or emancipation as you will. Our ideas were different in that his was played out with a much more exploitative tone. The film called *Sexbot Apocalypse* was the story about a revolution among non-humanoid sex workers as they rose up against mankind for all the unspeakable acts committed against beings who were believed to know no shame. While our ideas were somewhat similar, the tone of what I wanted to achieve was akin to science fiction films from the 80's. Daring, dark and adventurous with a dash of social commentary. I told him I would work on an outline and that we could regroup after Christmas.

Before I was going to commit to writing the full script, I wanted to test out the story in an outline form. I was going to have to pitch the project in my thesis class and I was wanting to get feedback before I moved forward. I spent the better part of a weekend and a dozen cups of coffee writing a free form plotline freehand in an old notebook. I would then draw arrows between paragraphs that I thought could be strung together into a cohesive narrative. I like to do this sometimes as a writing exercise- basically it's non-linear free form storytelling that is then turned linear. For instance, with Hard Reset I always knew the ending because that was the first scene I ever thought of. Jane (our female lead), having sacrifices herself for the sake of her kinds preservation. In doing so

she has also turned the tide of the revolution in their favor by convincing Archer (our male lead) that Synthetic emancipation is the only answer to the conflict in the world they inhabit.

So I basically started working backwards, developing act three around the major themes and ideas I wanted to present, then moving into act two to fully flesh out the conflict. Act one was the hardest as I had to find a way to setup this world and allow the audience to hopefully immediately connect with our characters. This seemed a bit daunting as the term "world building" definitely applies to a film of this type. It's an important storytelling tool that many science fiction and fantasy films do to flesh out the environment and climate of their characters existence, bringing context to all the pieces about to be in motion.

Before anything was fleshed out in great detail, I knew I had what I wanted to be the ending, the statement. I also knew that I wanted to swap the heroic sacrifice responsibilities in regards to gender. While in the finished film Archer does indeed have a seemingly heroic sacrifice, it is Jane in the end who has given her new found "life" for what she believes in.

After it was finally finished, I presented the outline to class and was met with a less than favorable response by all, including the instructor. The feedback had been that while Acts Two and Three were alright, Act One made no sense. The characters were alright some said, but the main character – Archer lacks motivation. He's just thrust into one situation from another without any sort of concrete reasoning. He was too passive. In a short film like this, a character who does not fit an identifiable archetype might be a hard one to follow. He is the audience surrogate, being thrust into the middle of a conflict he may or may not have any proactive nature towards.

I agreed with them, Archer was a bit too passive. He was the least interesting character in his own story. Not a good sign. So I went back to the drawing board regarding the characters and their place in the story. One thing that has never changed

was the title. *Hard Reset*. Just saying made me smile. I wanted a title that would represent a technical function in the film that serves as a major plot point, but also just sounded like a movie I would want to watch. I could imagine seeing some long forgotten 80's flick with a similar name while browsing the shelves at a local video store or my Netflix queue. With that solidified, I turned my attention to more important things…

Chapter 4: Dramatis Personae

Miles Archer, *31, Tec Crimes Detective and Synth Specialist*

Jane PS-626, *9 Months:3 Weeks: 2 Days, Pleasure Model Synth*

Sebastian Wright, 50, Tec Crimes Detective and Synth Specialist

While there is a much larger conflict going on behind the scenes in *Hard Reset,* at it's core the film is primarily centered around two relationships. Jane and Archer and Archer and Sebastian. The nature of these relationships evolved in many different ways over the course of the writing process.

In the first couple of drafts of the script the relationship between Archer and Jane was completely different. They were not lovers nor had they ever met. Archer is responding to a seemingly routine call to check out a malfunctioning synth when their paths cross. As with the finished film, Jane it seems has committed murder. With her new found sentience, she reasons with Archer to trust her and help her figure out why she lost control. Together they uncover a conspiracy by an all powerful Multinational corporation that intended to cause fear towards the Synths to keep them enslaved. The romantic angle was not included in these drafts as Archer was in fact much older, in his early 60's. This was contrasted (and is inverted in the final film) by the primary antagonist – Sebastian being a younger hot-headed loose cannon of a cop.

The older Archer was more of a paternal figure, not interested in Jane by virtue of her occupation. His interest lay in the moral predicament of the story. If any beings are capable of free thought or sentience, is it morally acceptable to withhold that sense of identity or free will from them? If they were never capable of understanding the situation they are in then is it so bad at all? This Archer was a man who has been worn down by time, he lives in a world without privacy, and very little freedoms. Jane's mission to spread synthetic freedom strikes a chord in him, perhaps reminding him of the past which

could be considered in that iteration of the story to be better times where such moral questions had obvious answers.

The problem with this version of the character was that it was hard to sell his motivation to help Jane out without needing more time to develop his eventual decision onscreen. He's never met her before and is doing a job he's done a thousand times[ix]. There simply was not enough time in a short narrative to make his compliance believable. It felt rushed and fake, in service of the forwarding plot by any means. I let this version of the character go as I would not be able to do this version justice. This iteration of Archer deserves to exist in a film that is 80% conversation and 20% action. For a short film we wanted more of an archetypal character for Archer. A character that if cast correctly would be immediately identifiable by the viewer. We wanted to be able to jump into the middle of our story and have that viewer feel like they know what this guy is about by minute five.

While I was amused by David's pitch for *Sexbot Apocalypse,* I had never really considered that Jane's character would be of that occupation. In fact I was very resistant to the idea of "Pleasure Synths" at first. But as the narrative started to grow and the endgame of Jane's character arc was becoming more apparent, I decided that in opening the film I wanted to give an immediate setup and payoff that would resonate throughout the rest of the narrative.

We open on two figures in a bed. It's a spartan looking abode, a holographic image of a far off place hums in a recessed panel on the wall. The two figures are whispering sweet nothings to one another when suddenly one of their voices glitches out. A small alarm goes off and the figure rises. A *Synth*. The appointment has come to an end it says, before leaving the dejected human questioning why he ever allowed himself to fall for a being that isn't even allowed to think for itself.

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ixTec Crimes Detective and Synth Specialists repair, reprogram or eradicate malfunctioning or "rogue" Synths.

This was Archer. The young version of Archer who made it into the final film. He's in love with a robot. A Pleasure Synth. He's dejected as it leaves, telling him that he cannot see it anymore as state sanctions have ruled that emotional attachments are invalid. "*This is purely economical. Have a nice day."*

One off the biggest missteps we took during the initial drafts was to have this Pleasure Synth be someone other than Jane. Originally the scene was meant to show the Archer basically going through a breakup with an automaton. I wanted people to ask, what exactly is going on in this guy's life to where he's falling in love with a robot? *Something not human.* It wasn't until a script polish by a writer friend named Mark Smoot, that the film-changing idea of having Jane be the Pleasure Synth that breaks up with Archer at the beginning of the film was conceived. Hindsight is 20/20 but I've told myself I must have been insane to have never come up with that plot point.

Originally I wanted the relationship between Archer and Jane to be platonic, which could have been interesting given what her constructed purpose was. It would've been interesting to me if the breakup had occurred between Archer and another Pleasure Synth, and his introduction to Jane was after the fact, which would mean that their relationship would evolve onscreen. Yet I can't ignore that that creative decision was ultimately the one thing that helped solidify our first act. It was our goal to leave a lot of the heavy lifting between the two off screen and jump right into the story at a most critical point, where the Synth tells the Human "We can't see each other anymore. It's not allowed".

This change sets Archer's character development into motion, it gives him purpose when coincidence throws them together again a midst the raging conflict that is bubbling over around them. It gives him motivation. Newly emancipated with a id, Jane is her own person. Archer asks if she remembers him. She does. He smiles. Narratively that's all we need to motivate his decision to help her. He's love struck and even though it doesn't happen to be with a human, hopefully it rings true to the choices he makes.

Even in the face of the odds that she might have committed murder, he wants to believe her. He needs to believe her. Maybe if she's a real live person now, his feelings are justified. Earlier in the film, he shrugs off Sebastian's question about his interest in "plastic". Now that Jane is "alive", maybe he has nothing to be ashamed of.

In stark contrast to Archer's affection towards a Synthetic Humanoid, is his colleague Sebastian. An older, grizzled and weary man he longs for a time before the Synths. He's not doing his job as a Tec Crimes Detective and Synth Specialist to help people, he's in it for a license to deactivate. He voices his fear towards the concept of artificial intelligence that is given free reign over itself. Much like the soothsayers in many a modern science fiction tale[x], he predicts a violent revolution. He believes in the idea that total control is the only option. If you were to give a drone an identity, a concept of itself – then allow that drone to realize that it's whole existence has been a form of forced enslavement – they will retaliate. Archer on the other hand has some sort of optimism if you will. That these beings, once freed are better than that. We wanted to structure this moral difference as a contest of logic versus faith.

Once the character arcs and relationships were solidified, the script fell into place much easier. While not perfect, it was workable enough to start thinking about how in fact we were going to get this movie made.

x*The Terminator. The Matrix. I, Robot. Battlestar Galactica et al.*

Chapter 5: Fund-raising and Pre-Production

Having a draft of the script we were comfortable with, David and I began to talk about entering pre-production on the film. At this point it was around February 2013 and we had not been approached to film in stereoscopic 3D. The idea was that with my visual effects knowledge, we should shoot this film on an ultra-low budget by doing what I had done years ago with *The Curse of Dracula Island.* All green screen, heavily stylized in a way that was more like a graphic novel come to life.

We also decided that we would forego crowd-sourcing in regards to funding and reach out directly to investors with whom we had contacts and relationships. This included family and close friends. Before we reached out to anyone though, we needed decided to get a pitch package together. I had gotten to know an undergrad named Kevin Harger (now graduated and working as a visual effects artist in Hollywood) and was immediately impressed with his skills as a fine artist. I had not seen anyone at his level during my time at UT and his skill was up there among the better fine artists I knew at Pratt. What impressed me the most was his speed. This guy could whip up ten incredibly detailed storyboards in ten minutes. Not thumbnails, but full sized, detailed storyboards with perspective and lighting values. We presented Kevin with a draft of our script and asked him to draw out the first five pages. Along with a few pieces of full color concept art paintings depicting a few key moments in the film, Kevin delivered the images to us and we got to work on creating a prospectus and pitch package for potential investors.

Without Kevin's art, I'm not sure our initial push would've been as successful. Upon showing his illustrations and storyboards, samples of David's work as a producer as well as examples of my work as a director, visual effects artist and cinematographer we were able to secure an initial amount of funding. Still under the notion that our budget would be kept quite low due to the all green screen nature of the shoot (3D had still not entered the picture), I was feeling cautiously optimistic that we were going to be able to shoot during the fall semester of 2013.

Then I got a call from at the time RTF Production Area Head Don Howard, who also ran UT's new stereoscopic 3D program, appropriately named UT3D. He asked if I would be interested in filming in native[xi] stereoscopic 3D. I was floored. Ben Bays, one of the visual effects and motion graphics instructors that I had been a TA[xii] for a couple of semesters had mentioned it as a possibility a couple of times, but I never really thought it would happen. As a director 3D has always fascinated me. Not only as a branch on the evolutionary tree of film-making, but as an incredible tool for filmmakers who are so inclined to add an extra layer of immersion into their storytelling or literally depth into their compositions.

In the year prior I had taught myself how to create 3D[xiii] animations using Adobe After Effects and had given up on moving forward with that line of self education as I never thought I would be in the position to actually shoot non-animated content in 3D. I was a fanatic for 3D in theaters. My first actual 3D non theme park experience was with *Beowulf*[xiv]. I was absolutely floored after seeing it. This was years before Cameron's *Avatar* would be released and I really had never seen anything like it. I was mesmerized by the use of positive[xv] and negative parallax. After that film came out, I made it a point to seek out and watch as many 3D films as I could. Animated or live action, it didn't matter. I even attended a special screening of the BCS Championship College Football game that was simulcast live in 3D across the nation in select theaters, while it had a few unintentionally misaligned moments that caused your eyes to cross quite painfully it was fun and quite engaging.

What really got me though in regards to stereoscopic 3D as a whole was the addition of a tangible Z axis into cinematographic composition. To me that was a revelation. I would find myself daydreaming of frames from these movies, these portals

xiNative stereoscopic 3D is shot with two cameras and the depth is built by combining the two separate images, one for each eye.
xiiTeaching Assistant
xiiiStereoscopic 3D, not 3D as in CGI
xiv*Beowulf, Dir. Zemeckis*
xvWhen stereoscopic images seem to recede into the screen, creating a "window" effect

into another world. Then *Avatar* was released and my head exploded. Cameron has always been one of my favorite filmmakers, I believe that Piranha *II: The Spawning (*which he was let go from) aside, he has not made a bad film and always seems to be on the forefront of using new technology to tell universally appealing (some would say to a fault, but I disagree) stories.

Avatar while being a fairly straightforward film narratively, was a jolt to the chest in regards to the film-making craft and talent on display. Watching it, I hoped one day I'd be able to explore a cinematic universe in 3D. Just thinking of all the ways in which I could enhance emotion, action and spectacle made me incredibly anxious for consumer level technology to appear. Of course, that never happened, I had no true understanding of how stereoscopic imaging worked beyond magazine articles and interviews. It would be over four years before I shot *Hard Reset* and understood how incredibly, amazingly complicated stereoscopic 3D film-making can be.

Chapter 6: Pre-Production and Revising The Budget

After an agreement was made that *Hard Reset* would be filmed in native stereoscopic 3D. David and I had to reevaluate how we were going to make the film. Even with a decent amount of visual effects experience, I did not feel comfortable green screening the film if we were shooting native 3D. I felt that if we were going to shoot native, we needed tangible elements within the frame. We needed sets. Since before we had not budgeted for anything but digital sets we had to try to figure out by breaking down the script how many we would need to build and what would be required to build them. We gave it a go, but found ourselves vastly under prepared to tackle this aspect of production with either of us having no real experience in production design or set construction management. Also, we had to contend with the fact that now if the sets were to be real, we really needed a production designer.

We needed someone we could trust to bring concepts into reality. No longer could everything be made in the computer, it had to be made to exist in space. Our first hire on the film was Javier Bonafont, a former RTF MFA Graduate working as a production designer in Austin. While the summer of 2013 was spent raising extra money and creating more production art and script revisions, Javier came on board in the fall to start planning out the constructed design of the film.

Around November 2013, we reached a draft of the script that we considered finalized until casting. We locked down scenes and their intended locations and Javier finished concepting and preparing for the build. RTF allowed us studio space on the 6th floor of the CMB studios. And we set a tentative shoot date of mid-January 2014. Our build was to commence Dec 1st of 2013 and we would occupy the studios for about 2 and a half months.

While all of this was going on, we brought on board another producer who was a good friend and frequent collaborator of mine. Taylor Thompson had produced my pre-thesis film *The Ascendant* as well as Andy Irvine's short *Hearts of Napalm* and his and

Mark Smoot's feature *The Love Inside,* both of which I had been Director of Photography on. It was good to have a familiar face on board as up until this point many of the crew during pre-production and I had never worked together.

Taylor began the long and arduous process of coordination and scheduling as David and went to work trying to find prop fabricators and a costume designer for the film. Seeing as it takes places at some ambiguous point in the distant future, not too much of what is seen on screen can be bought. Sheets of course will be sheets, and a cup may very well look like a cup. But what about a communication device like the equivalent of a cell phone? The form factor of that device has changed drastically over only the last eight years, hard to even imagine what it would look like hundreds of years from now. With that realization in mind and working with Javier we set out to create a handful of unique featured props that were completely original to our film. These include various "forearm displays", touch-pads, consoles and weaponry.

During Mid-December we realized there was no way we could make our shoot dates in January. Seeing as we hadn't even trained with the equipment and our D.P[xvi] (RTF MFA Graduate, Patrick Smith) was coming in from Los Angeles the pressure begin to mount.

That fall semester I had audited UT3D's new Introduction To 3D class taught by Buzz Hayes a 3D industry veteran who had worked on everything from *The Amazing Spider-Man*[xvii] *to Beowulf(*!). It was an incredibly entertaining and thoroughly informative course that on one hand had me so very excited about filming in stereoscopic 3D but on the other hand had me scared absolutely to death about the potential difficulties that lay ahead. Challenge yourself, kept repeating in my head. So I tried to not make it seem like I was scared out of my mind as 2013 turned to 2014 and we began to get closer to the shoot.

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xviDirectory of Photography, also referred to as Cinematographer
xvii*The Amazing Spider-Man, Dir. Webb*

Part of what was so frightening to me is that on a 2D film, I consider myself very organized in regards to pre-production, planning and conceptualization. For this 3D film, for the first time I was simply overwhelmed. Storyboards and concept art didn't seem like enough. The normal types of overhead diagrams I would draw as a DP seemed to be too simple. None of these things referenced our depth, or our plans for depth in the frame.

Buzz had mentioned many times the concept of a “depth script”. Much like you would break down or create a “line script”, the depth script was a way of tracking and creatively judging how you felt the depth should be throughout your film. After Patrick Smith was brought on as D.P, I asked Patrick Hoy, a local camera crewman who I knew had a vested interest in stereoscopy to join the film and help plan out the depth script. During the shoot he served as assistant stereographer and first A.C, but one of Patrick Hoy's most important contributions was helping to create the depth script before filming began. With this document complete, I was able to fully see the film in my head as it would be for the first time.

Chapter 7: Painting and Casting

Well into January we had lost a few of our Art Department crew to other productions and were severely understaffed. David and I had made it a point to pay everyone on this production since it was such a huge undertaking with a long commitment period but we never expected that by losing people we would have fallen so far behind. Thankfully two of our crew, Art Director Emily Hauseien and Lead Set Constructor/2nd Assistant Cameraman Tyler Draker were there to help set a new pace. One of the hardest aspects of creating all these sets (6 in total) was that each one had to be intricately detailed in regards to its texture and implied material. Wood had to be made to look like concrete, foam to granite. The poured concrete floor in the studio was painting to look like marble for one of our larger sets. All of these things add up to many man hours and restless nights. Luckily for us the crew pulled through and even though they were still applying finishing touches right into the shoot, everything was looking fantastic.

Simultaneous to the construction of sets, creation of costumes and props as well as the scheduling and crew hiring that goes along with a somewhat large (at this level) production, we still had to cast the film. In my head I always knew what I wanted Jane and Archer to look like. In the three years of living and making short films for graduate school and otherwise in Austin I had never encountered an actor at an audition who would fit either role. So Taylor, David and I decided to hire a Casting Director. Taylor had worked with a local Casting Director named Sarah Dowling before so she came highly recommended. Our casting process lasted a couple of rainy days in January and at first was quite depressing.

No one. Not one person no matter how talented felt like Jane. Far too often a line would be read monotone and disjointed like Siri[xviii] or a voiced GPS program. It felt like a lot of people saw the line direction of Jane not being a human, but synthetic and really

[xviii] Apple's voice activated software companion

ran with it in the opposite direction of subtle. We were looking for someone whose face alone was enough to tell a story, whose reaction shots opposed to dialogue coverage could convey what I wanted.

We found Josephine McAdam and Oryan Landa who would go on to be Jane and Archer in the same casting session. After reads with two other different actors we paired them together and I felt it click. Josephine, with her smaller stature and wonderful eyes had the right look. Her features seem to be an interestingly ambiguous mix of different ethnicity, even though she is apparently 100% Scottish. Oryan had the look of a rough spun yet surprisingly gentle leading man, wiry and lean with that determined look in his eyes the same way Kyle Reese[xix] was in Cameron's *The Terminator.*

Oddly enough, casting the role of Sebastian was the easiest. The moment Holt Boggs, walked in I knew we had Sebastian. What I liked about his eventual performance was that on the page Sebastian could be read as an irredeemable prick without any sort of understandable reactions. On screen, he while still salty and perhaps a bit too paranoid, he does seem to have some sort of heart or affection for Archer. As written earlier Sebastian and Archer didn't seem to care for each other at all. After casting Holt we gave them a more defined, and partner like relationship. This made the eventual "betrayal" and payoff more rewarding in the third act.

One of the key moments in Act Three of the film is a fight scene that takes place between Archer and three of what we would eventually call "Decons". These white armor clad security forces were meant to represent (if anyone wanted to ask) what happens to you in the universe of Hard Reset when you commit a grievous crime. There is no capital punishment in this society, instead you are lobotomized and mind controlled to don the armor and protect the very society you once sought to harm. The ultimate recompense for individuals that care little for others.

This fight scene was to be choreographed by Hector Gonzales, and performed by

xixPerf, Biehn, Michael. *The Terminator*

local stunt workers Aaron Alexander[xx], Lacey Robinson, Josh Vinyard and fellow UT MFA Candidate Erica Pallo. Four weeks before filming began Hector began training Oryan with the stunt crew. This meant that on the day of filming in the factory, the fight would be akin to a choreographed dance, with each other performers knowing their marks focusing only on their performance and allowing us to have a stress free day on set. Having directed and been cinematographer on quite a few complex fight scenes there is nothing more true than the fact that preparation is key.

xxStar of MFA Graduate Jordan Kerfeld's Thesis Film *Tears At Dawn*

Chapter 8: Production

I met Matthew Blute and Gregg Atwell within five minutes of one another. To be honest I'm not sure if I've ever been more nervous about meeting two people in my entire life. Here were two guys who hadn't been involved in any stage of our planning or prep, but were coming from LA to help out and help keep things on track. As excited as I was I was also terrified. What if they hated us? Or didn't like the project. I found myself grabbing a broom and sweeping up before they came in to see the sets. I wanted them to know that we were a legitimate production, all major crew might have been undergrads or recently graduated but we had it together. Gregg, a talented Stereographer, DP and Stereo Rig Tech was flown in from Los Angeles to provide support every day on set regarding the Pulsar rig and the the intricacies of dealing with a 3D shoot. Matthew Blute had just finished up as Stereographer on Michael Bay's *Transformers: Age of Extinction.* He would be offering guidance while shooting and visited the set whenever he was in town as he was going back and forth from Los Angeles.

My fears of meeting the two men were unfounded as they turned out to be two of the most genuinely amazing people I have ever met in this industry. Immensely knowledgeable, supportive and kind they were a pleasure to work with and within the first half day of their arrival we all realized that if Gregg was not around, there would not have been a movie. If Matt was not around, we would've got a lot of things wrong.

Before we went into the shoot I was told in advance by many people that stereoscopic sets were harder and slower, with less of an ability to shoot on the fly. I was worried a bit that our camerawork might be stilted or a bit bland. This wasn't due to a lack in faith of Patrick Smith, or any of our preparations, it was mainly due to the fact that the first time I saw the camera rig assembled, with the dual Red Epics and the crazy Pulsar frame I was truly taken aback at it's size. This thing was HUGE. It was almost as tall as me (5'8"- dolly arm not extended), weighing at least 3 times as much on the Vector Dolly, which was the only thing besides a very heavy duty tripod that could support the

weight.

The first time I saw it, I had a pit in my stomach. How were were going to shoot close ups with this thing? I thought. Part of stereoscopy is that you do not want to use longer focal lengths since they will compress the parallax in the frame and effectively reduce any feeling of depth. Gone were the days I could shoot my closeups on a long lens, a decent amount of space between me and the actors. No for this, shooting at 24mm or 27mm this giant contraption would literally be right in their face. There really was no way around that fact, and the fact that our dolly grip would be getting a workout every day.

In regards to the visual element of the film, I took heaving inspiration from genre films of the late 70's, 80's and early 90's. Films that existed before the ADD style of editing and camerawork took place. Films that allowed shots to hold and compositions to be organic yet striking. In a way, having the cameras attached to this huge, unwieldy rig helped serve that purpose. Every single shot in the film is on the Vector Dolly or the tripod, there is no hand-held. The film feels different because of that I think. It feels a bit more classic and planned out. If the rig had not been such a constricting element in regards to the way we could shot, I'm sure the overall look of the film would not be as cohesive.

Principle Photography lasted a little over ten days. The actors performed well against the towering technological behemoth inches away from their face, the crew eventually warmed up to the differences in a stereo shoot. By the time we were towards the end of the shoot, confidence built and experience had, we were getting almost as many shots off as we would've during a 2d shoot. Some of the problems we encountered were simple, fixable things. A couple of props did not work out as intended so we decided to cut or shoot around them. Some of the extras decided not to show up so we dressed up members of the crew as our background extras. Every now and then the camera would crash or go out of sync so we'd take 10 and deal with it. All of those things

paled in comparison to what calamity lay in waiting after we finished our first stint in the studios. Our one non-studio location dropped us with 16 hours notice before we were to shoot. This was the original location of the factory in act 2 and 3 of the film. It was a long vacated structure called “The River Mill” our of New Braunfels. The owner, even having signed a contract with us refused to let us enter. This was especially disconcerting considering we had been in negotiations with him for over four months prior to the shoot. Thankfully as any good producer does, David had a backup location which at the end of the day turned out to be ten times better in regards to It’s look, location and accessibility. The new location was the TIP’S Steel Warehouse off Baylor and W. 6Th street in downtown Austin. The rest of the shoot was without incident. After we finished a four day stint there we headed back to the studio to (as it usually goes with film schedules) shoot the very first scene of the movie as part of our last two days.

We wrapped with a nice party at a local bar, said goodbye to the cast and crew that had become pretty close over the months of pre-production leading up until the shoot. David spent three days cleaning up the studio on the 6th floor of CMB as much as we could. I then took a week off, as our Producer Taylor who was also one of the two editors on the film began to prepare the raw footage for the edit.

Chapter 9: Post Production

Heading into post I knew we would be facing challenges on this film. There aren't many examples of films that have been made using such high caliber equipment without a dedicated stereoscopic infrastructure or work flow. Within two weeks of logging the footage and syncing the left eye video track to the right eye video track to the audio(!) we were running into errors with sync.

Just like how audio can slip out of sync when recorded via dual system setups so can the left eye and the right eye video clips. Unlike audio sync issues which are not anything more than annoying for someone who doesn't have to deal with it on a daily basis, stereoscopic 3D sync issues between the eyes can be downright painful. Often times if you are watching a clip and you cannot tell why there is some sort of discomfort in your eyes but they seem to be "pulling" that is one of many things.

It could be a "Color Mismatch" – This is when the colors in one eye, do not line up with colors recorded on the other eye. Leading to uncomfortable ghosting of differently colored areas in the frame.

It could be a "Rotation Alignment Issue" – This is when one of the cameras was slightly off on the X, Y or Z axis compared to the other while filming which means that when paired together there will be distortion.

It could be a "Size Mismatch" Which means that if you were using zoom lenses, one lens was at a slightly different focal length than the other.

And of course if could just be plain out of sync and as stated before, it can be painful.

Throughout the course of the following months we had many issues pop up with our improvised stereoscopic work flow. Many times we hit what we thought was a wall, sometimes losing as much as a whole weeks of progress due to the lack of available

information on how to solve our problem. The worst moment was in July of 2014, we had almost locked the edit for visual effects and suddenly one day every single take that was actually used in the film went missing in Avid. Every take. It had taken us almost 11 days to ingest and transcode all the media from our shoot back in April. This time we did not have to re-transfer everything, but seeing as our shooting ratio [xxi] was very low, it still was quite a lot. I believe we lost 6 days of progress due to that error in Avid.

By August we had mostly left Avid and It's myriad of problems concerning stereoscopic non-studio supported work flows behind. We entered the visual effects phase of post. Earlier in the summer we had four local artists work on various assets for the film. These assets included matte paintings of our futuristic skyline, vehicle concepts, user interface ideas as well as computer generated models of buildings and devices. They finished work in July and in August after we had locked the edit I began the long process of compositing[xxii], motion tracking and match-moving[xxiii] all the assets into our film.

xxiThe amount of footage shot versus the final length of the film

xxiiRemoving the green screen by way of "keying" out the green pixels and replacing that with pre rendered or painted backgrounds

xxiiiGenerating positional data from the live action footage so visual effects can be placed in the shot

Chapter 10: Visual Effects and Finishing

I had previously had a large amount of visual effects experience in both the motion graphics and cinematic realm. That being said, absolutely nothing could prepare me for what laid ahead. My pre-thesis, *The Ascendant* was a twenty two minute long film about a colony ship[xxiv] that crash lands on a desert planet. It had around seventy effects shots, most that I would consider pretty simple. By comparison, *Hard Reset* has over three hundred effects shots that had to be done in 3D. So, that good feeling I got when production was wrapped and I thought- man the hardest part is over? Wrong. You know something is equally soul crushing and uplifting at the same time when you spend four days straight trying to fix one shot and you fail over and over again. Finally on the fifth day, in the middle of you wondering why you haven't just looked for an alternate take or a way to cut around the scene- you crack it and it works.

The visual effects of Hard Reset are a combination of many things. Traditional matte paintings, animated vehicles and motion graphics, as well as simple camera tricks and practical effects that were handled on set, but enhanced afterwards. To illustrate an example of a more "complicated" visual effects shot I'll describe in detail a couple scenarios.

Scene three of the film finds Archer and Sebastian meeting before their patrol starts outside of Archer's apartment complex. They are standing a midst a tiny crown on a small elevated sky walk. Our front facing two shot and singles were relatively simple. We had actually created most of the sky walk on set, including the food kiosk. We then surrounded as much of the set as possible with green screen flats to allow more options in post production as to what would be within other areas of the sky walk, or behind our characters. On the reverse, which is over both of the mens shoulders we see the sprawling city, complete with flying cars, advertisements flickering off large skyscrapers and more specifically a gigantic video screen where Archer see's the Synthcorp advert for Jane. On

xxivScience fiction trope of a large vessel traveling in deep space with thousands of passengers to populate a new world

the reverse, all we really had in frame that was not green screen was the backs of both of our characters, and a small strip of railing that they are leaning against. Everything else in this shot is computer generated and designed.

The process for this is somewhat complex, in the reverse wide – showing the city over their shoulders the main task was keying out the green so I could place the background, then cloning various parts of the scene to create a larger image. This is because the original shot was framed a bit tighter than I would have liked, so I had to extend the railing of the sky walk horizontally to be able to shrink the image and make Archer and Sebastian feel smaller in the frame.

After that was done I placed the matte painting (which in the final frame is just a sliver of the screen) in a spot that I felt was aesthetically pleasing. Next came the introduction of the buildings and skyscrapers. I used a plugin for After Effects called Element 3D to take single building models, then sort of randomize their shape and composition. This gave me sort of an unlimited palette of shapes to work with that were all unique and not quite of our time which served the film well. I would position these objects in 3D space (X,Y,Z coordinates) and start testing out the perspective in stereo. The way to do this, since we shot the film parallel and not converged is to simple offset all the visual effects elements in one eye from the other. Usually horizontal offset will approximate what the inter-axial was, but most of the time while that data was valuable it ended up coming down to what looked and felt right.

After the bulk of the scene was set up, then the fun part starts. Adding in all the graphics and flying vehicles. The graphics were all pre-made or pre-animated during the summer of 2014, so adding them into the visual effects composition is a matter of selecting what you want, making sure that it is not too similar to anything else you've already used and then experimenting by placing it in the frame.

The hardest part of that reverse wide was finding a proper place for the gigantic video screen that is across the wide open space of Archer's sky walk and the next

building. It was a challenge to find a place to house that video screen that would match Archer and Sebastian's eye lines on their singles while also looking aesthetically pleasing in the wide. This is the main reason I shrunk Archer and Sebastian down and added the digital set extension of the sky walk. Having them smaller in the frame gave me more room vertically to integrate that video screen and the composition felt way more pleasing. After all the photographic and CG elements are added and refined, virtual light by way of glow effects, fog effects and flare effects are added to the scene. This is the last step before the shot is exported to be colored in Da Vinci Resolve.

On the other end of the spectrum, there are many visual effects shots in the film that aren't as flashy, but serve the film in an equally important manner. Smaller things like the glowing dots that move across Jane's face lines, twinkling ships moving through the city in the background of some of the singles and wide shots or the way some of the motion graphics on the forearm displays that Archer and Sebastian have are subtly animated. All of these things add a tiny bit more to the world building that is taking place in the film. Visual effects like stereo are just another tool in the filmmakers toolbox. The tool can be used delicately and with care as to hide it's very presence. Or it can be wielded like a hammer, which bluntly smashes into everything and causes a ruckus. I don't think it there is an absolute right or wrong way to use visual effects, but I do feel like they allow me to tell stories far larger and more dynamic that I would be able to otherwise.

Finishing a project that is heavily saturated with visual effects is exhausting, depressing and sometime unhealthy. Yet there is nothing in this world as simultaneously gratifying as taking a step back after you've cracked a shot and realizing that you've created some form of magic.

Chapter 11: Final Touches

After the visual effects were complete and there was a version of the movie that existed without much trace of green screen on text blocks indicating a “city shot” or “close up of graphic” (save for a few, complicated and yet to be finalized shots) I started working with Simon Quiroz and Wayne Miller to finish the film. Wayne, who had been a part of UT3D from the start was a large part of why the project existed, his connections to 3ality and Sony among others allowed us to work with industry standard equipment in the making of the film. He was mainly on board at this point to provide valuable insight into the process known as “depth grading”. This is a process, done usually after color correction where the independent video streams for the left and right eye are merged in a program such as Da Vinci Resolve and manipulated as to provide the best 3D image.

There are two parts to the depth grading process as I know it. The first part which takes the longest is a shot by shot analysis in regards to alignment and sync. Sync is as it sounds and fairly easy to spot when there is an issue, but alignment is another beast entirely. During production, the beam-splitter rig (Pulsar) is carefully calibrated to capture two distinct images that when placed atop one another, or in succession for a stereo pair. This stereo pair has to be aligned accurately in regards to vertical pixels and horizontal pixels to register a perfect 3d image. For example, if the shoulder of a character in the left eye is five pixels higher than the same shoulder in the right eye, there is a discrepancy, and while the average person might not be able to immediately call out “Alignment issue!” they will feel it. They might not know exactly what they are feeling, all they will know is that something is wrong with the image. Besides vertical and horizontal alignment issues there are also rarer issues like scale or rotation alignment.

Scale means that during the shoot one of our zooms focal lengths was slightly nudged so that instead of both captured eyes being 27mm, one eye might actually be at 25.5mm. The solution for that is to blow up the image ever so slightly and shift the verticals and horizontals to line up again. Rotation is similar, you figure out which eye

you want to match to the other, slowly correct the rotation (on the Z axis) then inevitably zoom in a bit to makeup for the lost pixels that are created on the edges of the frame by the rotation. So basically, what was described above is done to every single shot in the film, with the exception of the dozen or so shots that are one hundred perfect computer generated, alignment issues do not exist in that realm.

Afterwards Simon, Wayne and I then go back to every shot and start deciding where the depth feels appropriate. This is a crucial step. We are basically positioning the volume of the shot in regards to space, manually. For instance, in a tense, dramatic situation is it more effective for the characters face in a single to be within the frame (positive), or is it more effective for the character to break the plane of the screen and appear closer to us, the viewer?

Initially, I always assumed my attraction to 3D was that it was a “window” into an alternate world. Reality could be bent through the screen, *into* the screen. Until I started to talk to Wayne more about 3D and it's concepts, I never really understood that so much of what I liked about 3D was yes, the positive or “interior” parallax, but also the “negative” or exterior parallax. The revelation of that was sort of embarrassing, since I had felt so strongly biased towards positive parallax or the “window” view of 3D. The way I thought of it in my head was that before, I had been content to sit at a closed window, the landscape and skies and birds beyond, never getting too close to the glass. Now, with the window open, the birds are in my room, I can feel the wind and everything just seems a little more clear.

Therefore, many decisions were made about using negative parallax to draw the viewer into the characters worlds and situations. As a dialogue scene would go on and the stakes would start to raise, the characters themselves would seem to come forward. Subconsciously I believe this does add an extra layer of immediacy to the proceedings.

In November and December we had a couple sessions with Wayne, but after the VFX were finalized in late March of 2015 we had a couple more just to lock down the

depth in the film and make sure with was working the with color correction Simon was doing parallel to all this other work. Now in a non VFX heavy film, this would've been the last step. But as with anything that happened during the making of Hard Reset, nothing ever really was the last step. After Wayne left at the end of March I was left with a list of about fifty things to fix. These fixes were corrections to the visual effects that could not be solved by just shifting the images or with careful color correction tricks.

These fixes which did include many of the most difficult shots in the film took up the better first half of April. Most of them were mainly related to matte lines on the actors or colors that were too or under saturated. There are so many variables that go into play with stereoscopic visual effects that are just not a problem in 2D. It is a shock to the system to encounter so many unimaginable issues over the course of a production. An effect might be perfect in one eye (totally fine for a 2D movie!) whereas in both eyes, when put together it would look rubbish. Since work has to be done separately on both eyes, this was a sometimes very dispiriting process. Spending days or even a week on a very important shot only to find that when the effects are carried over and put into stereo the shot just doesn't work. Thankfully that only happened a few times, otherwise I'm not sure how my sanity would've lasted. Regardless, the film has to make it. It has to be done and ideally there are no shots that will read as weaker than others. Ideally.

I am proud of the work I did on Hard Reset in regards to visual effects. Are there things I would want to change? Of course. But given the time and resources I have no regrets with what is on screen.

Chapter 12 : Conclusion

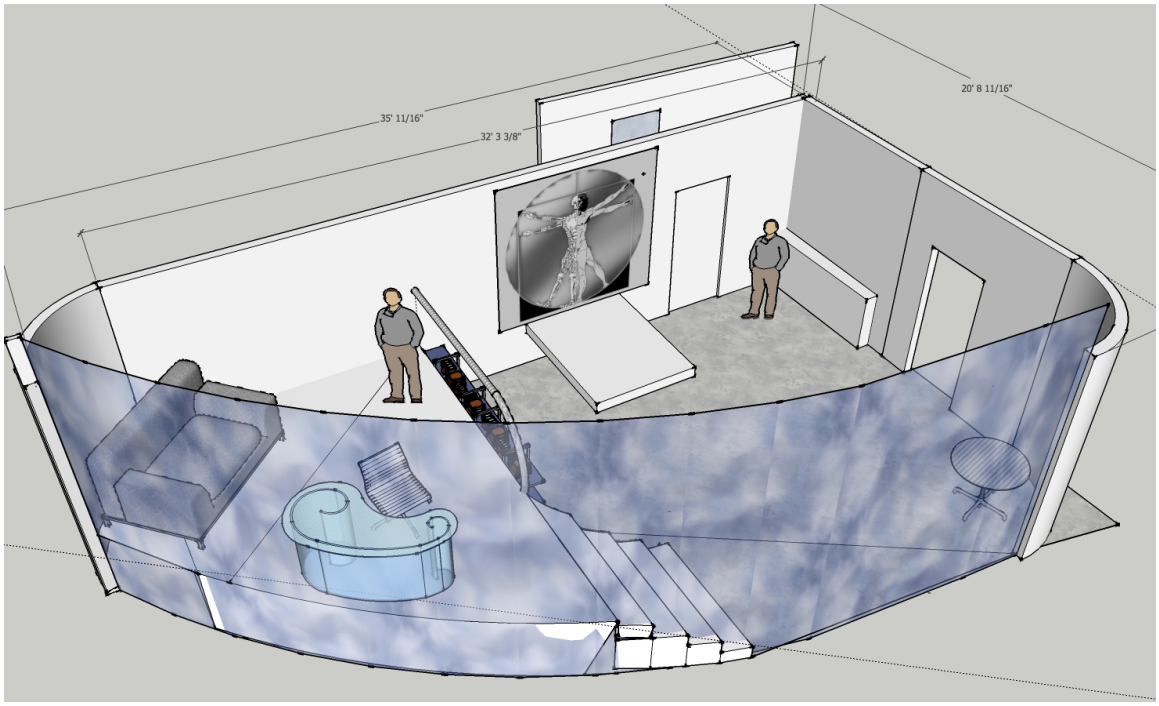
As this journey which started over two years ago comes to an end I still can't believe it actually happened to begin with. I look back on the time spent in pre-production and the whirlwind that was production and I wonder: how did we do this? And when I say that I want to emphasize "we". I may have been the director and co-writer of this film, but absolutely none of this would have been possible without the generous support of UT3D, RTF our entire crew and cast, our families and everyone else who helped us along the way.

I am a firm believer in that while being a wonderful medium of individual expression: film, at least the film I want to create or be a part of is the best laid definition of a collaborative medium. What creating *Hard Reset* has taught me the most is the joy of rearing this frantic child of a movie into adulthood. Shepherding it along the way as it evolves from a keystrokes on a keyboard, to hammer and nail, to light, lens and sensor, back to the keyboard and into the eyes. I feel joy because I was never alone in doing it, and I am so proud that I can say: we made this together.

APPENDIX A: PRODUCTION ARTWORK AND STILL IMAGES FROM FILM

The following images are selected from a portfolio of Pre-Production materials.

They are followed by stills showcasing their evolution into the final film.

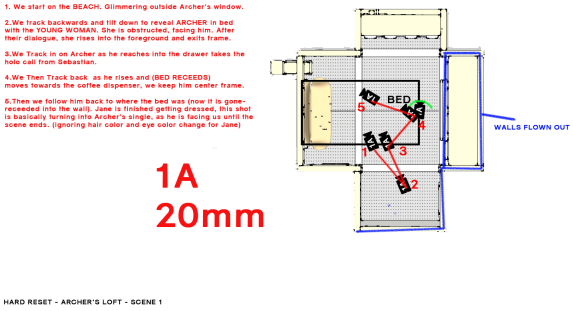


Render of “Simon's Loft” Location. Pre-Construction.

Still from finished film of “Simon's Loft”

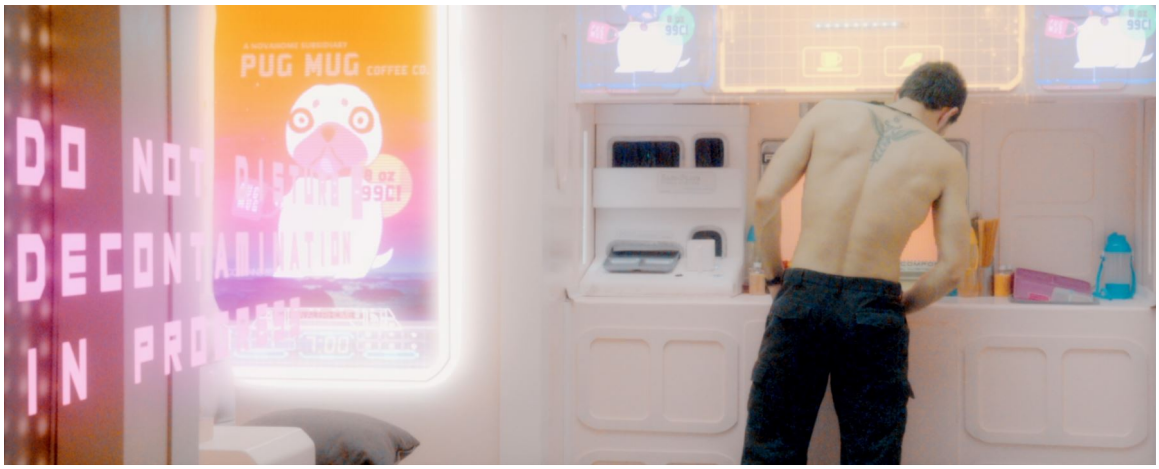
Still from finished film of “Simon's Loft”

Still from finished film of “Simon's Loft”

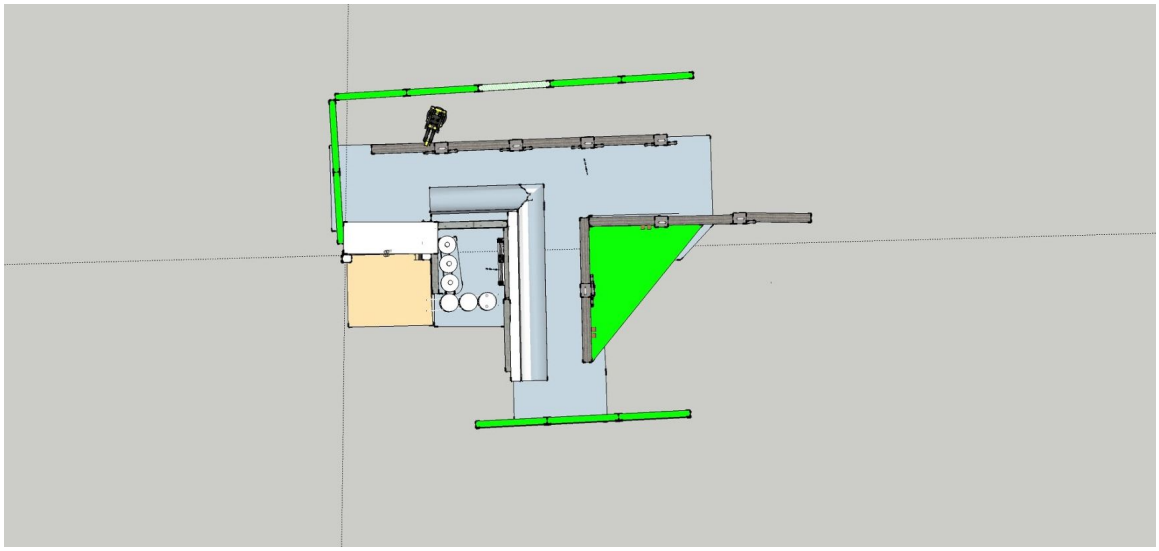


Overhead Diagram of Scene 1, Shot 1A- “Archer's Loft”

Still from finished film of Scene 1, Shot 1A - “Archer's Loft”



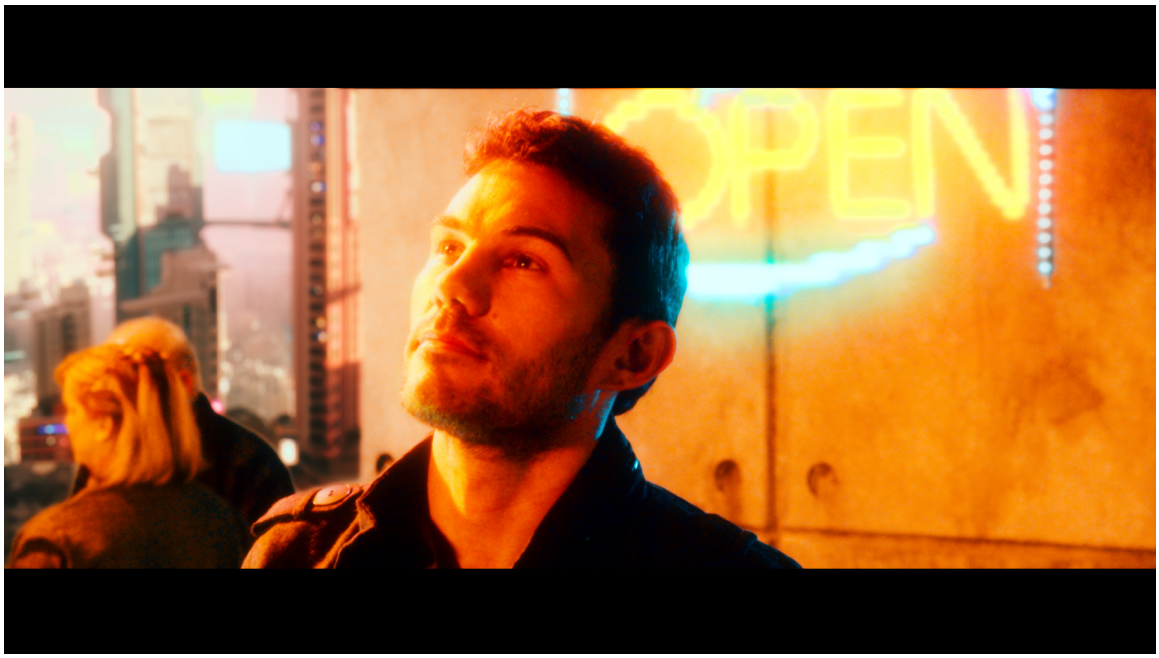
Still from Still from finished film of Scene 1, Shot 1A - “Archer's Loft”



Overhead and Construction Layout of “Lower Level Skywalk”

Still from Still from finished film of “Lower Level Skywalk”

Still from Still from finished film of “Lower Level Skywalk”



Still from Still from finished film of “Lower Level Skywalk”

Still from Scene 18 “Abandoned Factory” Location

Still from Scene 18 “Abandoned Factory” Location

“Decon Rifle” Weapon Prop Conceptualization

“Decon Rifle” Weapon Prop in Final Film