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TECHNOLOGICAL ADVANCEMENT THROUGH CHARACTER DESIGN: DARTH VADER AS CASE STUDY

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ABSTRACT

The importance of character design in films and other media may have an indirect impact on future concept arts, ideas and technological advancement. Based on a story, a conceptual artist would create many, even hundreds of different designs before reaching the final product of characters, environments, vehicles, creatures and more. From these final works we get iconic figures, futuristic weapons and new worlds on the big screen that serve our entertainment purposes and hint at what the future might hold. The purpose of this paper is to bridge the idea on how conceptual art can have an impact on science, our everyday lives and even the entire world. By analysing Darth Vader in Star Wars films as the core subject, one of the most iconic villains in the history of cinema, the research will focus on the pre-production process, and how his final design can be influential to advanced technological research on prosthetic limbs, breathing apparatus and more. The process of concept art as well as the understanding of Character Archetypes will also be presented. Other well-known characters from three different platforms (film, computer games and animation) will be used as comparisons to Darth Vader in terms of similarity regarding his type of injuries and the modifications made to their bodies that could one day become an invention and thus again relate to the importance of character design.

Keywords: Character Design, Concept Arts, Darth Vader, Technology, Character Archetypes

LO SVILUPPO TECNOLOGICO TRAMITE IL DESIGN DEI PERSONAGGI: DARTH VADER COME CASE STUDY

SINTESI

L'importanza della creazione di personaggi in film e altri media potrebbe avere un impatto indiretto sul futuro dell'arte concettuale, le idee e il progresso tecnologico. Basando sulla storia l'artista concettuale crea molti, addirittura centinaia di diversi prototipi, prima che riesca a creare un prodotto finale, vale a dire un personaggio cinematografico, un'ambiente, veicolo, altre creature etc. Essi poi diventano personaggi di culto, armi futuristiche e nuovi mondi, che rappresentano un divertimento sul grande schermo e un accenno di ciò che porterà il futuro. Lo scopo di questo studio è di accennare l'idea che l'arte concettuale può avere un impatto sulla scienza, sulla nostra vita quotidiana e il mondo in generale. Con l'analisi di Darth Vader dalla saga cinematografica Star Wars, uno dei più famosi antagonisti nella storia cinematografica, lo studio si concentra sul processo di pre-produzione e di come il progetto definitivo del prodotto può influenzare sul progresso della ricerca tecnologica nel campo delle membra prostetiche, apparecchi di respirazione etc. Sarà inoltre presentato il processo della nascita dell'arte concettuale e la comprensione degli archetipi dei personaggi. Presenteremo altri personaggi noti provenienti da tre diversi media (film, giochi di computer e animazioni), comparandoli con Darth Vader dal punto di vista della somiglianza delle loro ferite e le modifiche sui loro corpi, che un giorno potrebbero diventare una vera invenzione. Proprio per questo esse si legano direttamente all'importanza della creazione di personaggi cinematografici e altri.

Parole chiave: design dei personaggi, arte concettuale, Darth Vader, tecnologia, archetipi di personaggi

INTRODUCTION

The importance of character design in films and other media may have an indirect impact on future concepts, ideas and technological advancement. Many sci-fi films, games and animations feature characters that stem from ideas and concepts based on technologies that do not exists in that particular time or ever, from Star Trek's beam transporter to the Star Wars cybernetically engineered villain Darth Vader and the cyborg Adam Jansen from the Deus-Ex game. They all inspired a developed camera eye that is fully functional by the user (Spence, 2011). Darth Vader's character design might prove helpful in future research on life supports and other biomechanical prosthetic limbs for injuries that could be just as real and could happen to anyone. How was the iconic Darth Vader conceived? It was by none other than the vision of George Lucas and the creative visuals of Ralph McQuarrie (Kaminski, 2007).

In 1977, in San Francisco, California, an idea was born that would explode into a culture that attracts millions of fans, gains billions of dollars from movie screenings, merchandises and toys; and for some represents a way of life: the epic space opera called Star Wars (Kaminski, 2008). Star Wars is a grand romanticized story, which consists of six films that, throughout the two-part trilogy, preach their ideology on socio-economics and cultural diversity, politics, war, oppression, betrayal, moral values and many more. It has an exquisite storytelling that intertwines characters through events that were heavily influenced by past and present cultures and developments of the world.

Originally, Star Wars was perceived as a swashbuckling fairy tale full of humour, adventure and simple mythology, with good guys on one side and bad guys on the other. It was a romantic story in its idealized and heroic depiction of chivalry and adventure, a perfect fusion of old-fashioned storytelling and modern technology. Nowadays Star Wars became an epic saga filled with melodrama and a scope that spans the forty-year rise and fall of Anakin Skywalker and the plot thickens with the mere mention of an iconic name: Darth Vader (Kaminski, 2008, 6).

George Lucas, the creator of Star Wars, generally summarized it as being about Anakin Skywalker's life, from his fateful meeting with Qui-Gon Jinn in order to be trained as the chosen Jedi and only later to become the manifestation of evil that is Darth Vader. In an article interview for Total Film Magazine, George Lucas again stated that the Star Wars story really is the tragedy of Darth Vader (Agar, 2014).

According to Steve Persall (1999), Anakin is the ultimate hero**,** and his Darth Vader identity is merely the low point he endures on the trail of a finer elixir. Anakin completes his hero cycle throughout the six films. The visual aesthetics play an important part in the films. The concepts and research for the worlds they have created, the civilization throughout the universe help them conceive characters that will live beyond the film and will be idolized by many. Character design is one of the key elements in film making, whether it is live-action or an animation. Sketching is a functional tool in achieving a design. Designer's creativity and imagination blend with the proposed theme results into a good visual representation of a final output. Every design starts with an idea, and the successful utilization and combining a whole range of skills with basic knowledge helps to achieve a high-quality image. Sajjad and others stated that: "Character design is an art that relies heavily on a particular subject with the combination of basic shapes and colours" (Sajjad, 2012, 345).

According to Peter Hodges (2011), the importance of graphically rendered characters has been paramount in this new form of entertainment. Peter Hodges continues to mention that a successful animated character, just as a successful actor, can be used to sell products, concepts, information etc. A simple graphic representation becomes instantly recognizable, appealing, emotionally accessible and engaging. Thus the importance of conceptualizing characters to create who these characters are in accordance to the story and how they adhere to the technologies and the world they live in (Hodges, 2011).

There are many aspects in character designing, one of them being character archetypes. Bryan Tillman (2011, 11) mentioned in his book that certain traits are evident in all characters. The traits called archetypes allow us to categorize each of them into certain groups. An archetype is considered to be the original mould of a person, a trait or behaviour that we as humans wish to copy or emulate.

Tillman continues that the character archetypes that we use today are usually set forth by Carl Gustav Jung. In accordance to Jung, the archetypes are structure-forming elements within the unconscious. These elements give rise to the archetypal images that dominate both the individual fantasy life and the mythologies of an entire culture. Each one of the major structures of personality is also an archetype. These structures include the **ego, the persona, the shadow, the anima** (in men), **the animus** (in women), and **the self** (Sofia University, n.d.).

George Lucas may have written Star Wars based on Jason Campbell's study on thousands of years of mythology (Kaminski, 2008, 2). It was also noted that Carl Jung was a mentor of sorts to Jason Campbell (Persall, 1999). The very villain that Anakin transforms into becomes the main antagonist. He was related to as the shadow and he was none other than Darth Vader himself.

RELATED WORKS

The iconic science fiction character Darth Vader's suit and its technological features can be related to other similar dominant characters of the genre. Although it is likely that the diversity in the designs and functions of

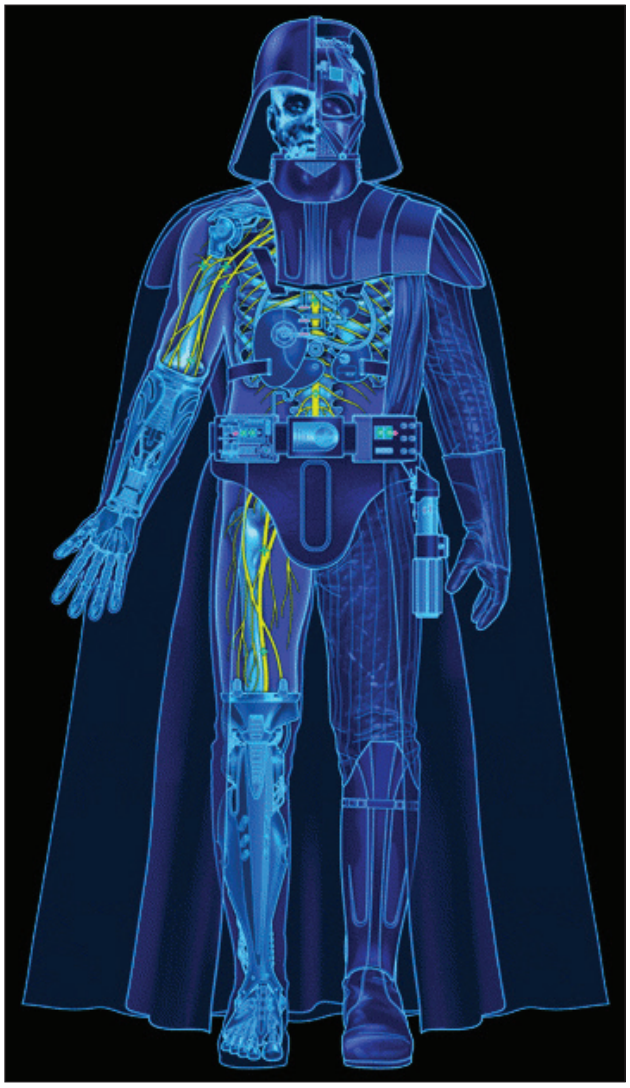

Figure 1: Darth Vader Technological Character Design (Source: https://comicvine.gamespot.com/images/1300-1896357/)

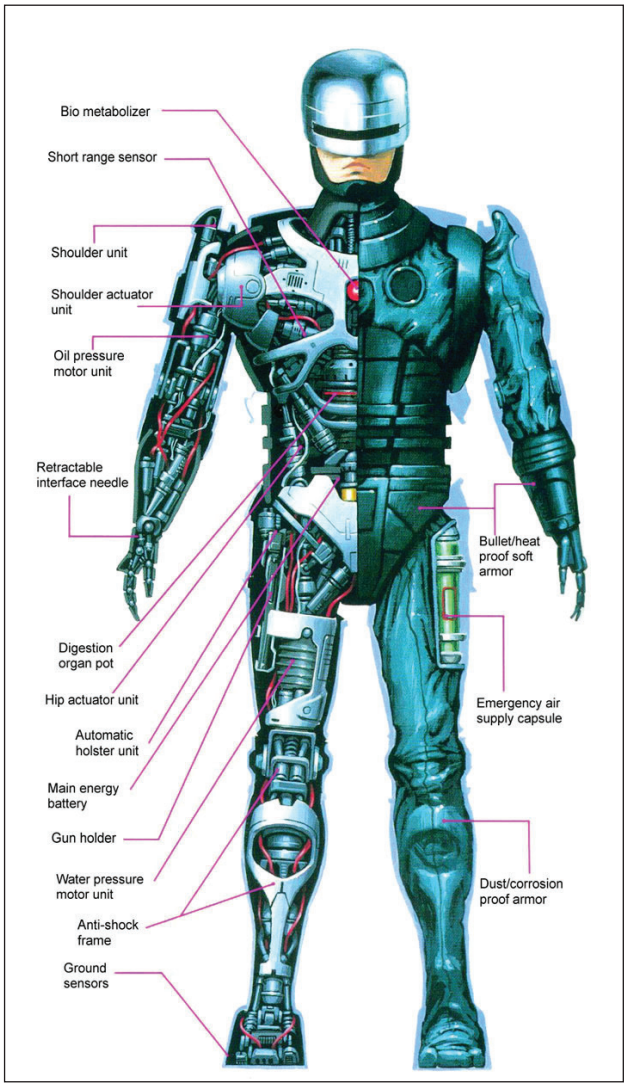

Figure 2: Robocop's armour concept and ideas (Source: http://www.robocoparchive.com/info/blueprint3.jpg)

the characters' attire would also be related to the story, the niche of the technological aspect of the designs of the characters is still within the scope of the topic (Figure 1). This topic will address related works and examples of characters from available and known science fiction titles from the different media of entertainment.

The first title that will be discussed is Robocop, out in 1987. Alex Murphy, a recently transferred Metro police officer is caught, tortured and brutally executed by the villain of the title, Boddicker, and his gang. Pronounced dead, Murphy is selected for a project that involves combining state-of-the-art technology, armour and weaponry. OCP merged Murphy's mind with machinery to create Robocop, the crime-fighting cyborg. Relating to the topic, the main protagonist Alex Murphy was pronounced dead but the scientists were able to save much of his brain, face and upper body, and used technology to replace what was lost and enhance what was saved.

In a different view, the armour that Murphy was integrated into sustains him, helps to improve him and adds additional benefits to the body, for example computer assisted targeting, stronger mechanical joints and legs as well as protection of the officer's saved vital organs. Roy Cohan from Writeups.org, a community website, stated that:

> *Before his cybernetic enhancement, Alex Murphy was a skilled police officer. His subsequent alteration built on those abilities by providing him with a cyborg body with superior strength and durability*

Figure 3: Appleseed: Alpha Technological Features (Source: https://wn.com/appleseed_alpha)

> *(his armour shell is titanium laminated with Kevlar) as well as various on-board extras including a HUD computer interface, a radio transmitter, and infrared vision capability (Cohan, 2014).*

Indicating enhancement and sustainability of the armour on the main character's body, much like Darth Vader's body suit (Figure 1). Figure 2 shows a diagram of the Robocop's armour concept and ideas put into design before the creation of the replica used for the movie.

The second piece that has a similar character development and technology features incorporated into the character is the animation Appleseed, directed by Shinji Aramaki. The second lead character is Briareos Hecatonchires, a soldier who has lost his body in a weapon explosion. The information on the character and augmentations were found on an independent fan website Briarios.org (Steve, 2001), where a paragraph indicates that the elements in terms of damage towards the body and the technologies integrated into it to support it are comparable to Darth Vader's: Briareos Hecatonchires, or Bri for short, is a character from Masamune Shirow's manga "Appleseed". He was human until the age of 26 when he was caught in a near fatal explosion. Bri was transferred into an advanced cyborg body with a new "Hecatonchires" operating system, so called because the octopus-like wired brain operating system has an almost limitless number of I/O ports. Briareos was able to operate 100 separate limbs with his OS, hence the name "Hecatonchires" (now aren't you glad I put the classical version first?). The only parts of him that remain

Figure 4: Deus EX: Human Revolution (https://www.pinterest.com/explore/deus-ex-human/)

human are his central nervous system and his memory. His brain was improved with a processor that generates information through concepts (not a traditional computer coding).

Figure 3 depicts the finalised model used in the animation Appleseed: Alpha also directed by Shinji Aramaki in 2014. The picture gives a visual indication of the technological features of the character's head: although purely fantasized, it is born from conceptual art and given life and credibility in the form of an animation.

The third one among related works is a character from a futuristic and science fiction game entitled Deus Ex: Human Revolution developed Eidos Montréal. Adam Jensen is a former special operative and director of security in a fantasy bio-tech firm that specializes in human augmentations. After a near fatal accident his entire body is equipped with cybernetics and technologically advanced augmentations (Giantbomb, 2013).

The Deus Ex has inspired a documentary on the technology and concept from the game, as well as the comparison of the level of augmentations technology featured in the game versus modern day science and the level of today's technologies. The documentary is entitled Deus Ex: Human Eyeborg (Spence, 2011) is hosted by Rob Spence, who lost one of his eyes to a shotgun accident. His lost eye was replaced by a prosthetic eye featuring a build-in wireless video camera. A quote from the documentary (from 0:29 to 0:46) hints that Adam Jensen, the main character of the game, has the same feature as the host: *"This is Adam Jensen. The main character from the video game* Deus *EX: Human Revolution* [see Figure 4]. *He's also a cyborg, but from the year 2027. He's got a camera eye as well, and some other high level augmentations"* (Spence, 2011). Later in the documentary, the host compares other features and concepts portrayed in the game with the level of today's technology, focusing on human augmentations, such as prosthetics legs and arms and augmentations related to brain nerves. Figure 4 depicts the concept art of the main character of the game Adam Jensen, created by Jim Murray. It includes his prosthetic arms and body armour.

CONCEPT ART

According to James Pickthall (2012), concept art is a visual representation that aims at and communicates ideas and moods for use in films, games, animation and/or comic books before its final representation is confirmed. He also mentions that concept art is a key factor in focusing and narrowing down the artistic vision and rooting out all the problems that could occur further in the production pipeline.

Its purpose is reducing and minimizing the margin for error which, as a result, tremendously reduces time and production costs. The iconic science fiction character Darth Vader was initially conceptualized as a mere fictional army General before he grew into a more

Figure 5: McQuarrie's earliest sketch of Darth Vader (Source: http://fd.noneinc.com/secrethistoryofstarwarscom/secrethistoryofstarwars.com/visualdevelopmentofdarthvader.html)

sophisticated villain with a tragic history and injuries. In 1977, Ralph McQuarrie began to create conceptual art on how this character would look like while referencing from the story drafts given by director George Lucas. This conceptual art served as a foundation for the technologies and design that would be used before the creation of real life character costume and props. A paragraph extracted from a website discussing the visual development of the character relates to the very first concept conceived.

McQuarrie's earliest sketches (Figure 5) show a man similar to Valorum or General Vader from the first draft, he is tall and has a flowing cape. A distinguishing feature is that the character wears what looks like a kind of futuristic gas mask over his face. McQuarrie explains that it is a personal respirator because the character had to cross through space from the Imperial Star Destroyer to the rebel cruiser. "*Early in the script there was a description of Vader crossing between two ships in space so I created this mask so he could breathe in space*" McQuarrie explains. "*George loved it*." (Kaminski, 2007).

Ultimately, the designs incorporated into the helmet of Darth Vader were finalized as a combination of a wide-brimmed Japanese Samurai headgear and a technologically advanced respirator helmet as shown in figure 5. The body armour and cape of the character were conceptualized and based on the Bedouin warrior

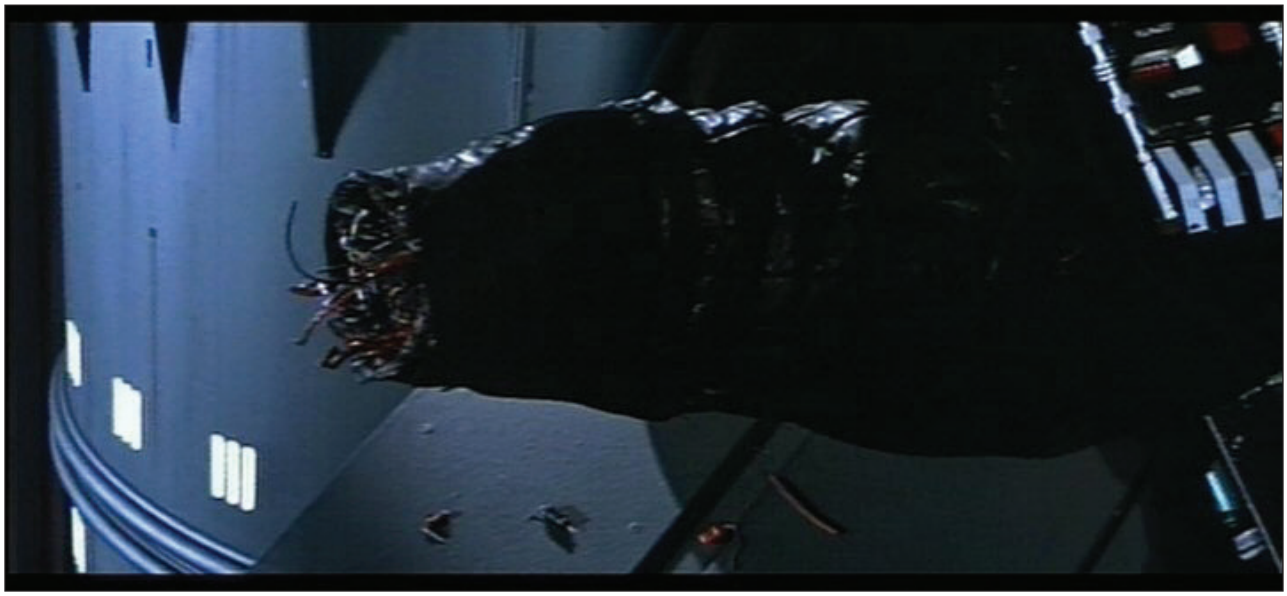

Figure 6: Cyborg character physical and internal injuries (Source: http://www.theforce.net/swtc/injuries.html)

attire and a selection of comic book villains, such as the Marvel Comics Doctor Doom from The Fantastic Four (Marvel 1930) and The Lighting from the Fighting Devil Dogs serial. The costume of Darth Vader was finalized as a technologically advanced space suit and a crucial piece of the character himself because without it the human part inside would weaken and parish. Two statements from A Secret History of Star Wars (Kaminski, 2007), a website discussing Star Wars and its iconic villain, examine the final outlook of the character's appearance development:

> *All of these changes made Vader seem more high--tech, more electronic. Finally, one of the more obvious facelifts was the finish of his costume. In Star Wars it was a well-worn armoured space suit but now it was a sophisticated life-support device, and thus it was made slick and shiny, polished and clean (Kaminski, 2007).*
>
> *This design was given even more robotic overtones however--the hand-sculpted mask of the original films was remade using a robotic tool to ensure the mask was perfectly symmetrical. The chest box was now made to be fully integrated into Vader's torso, creating a cyborg look (Kaminski, 2007).*

IN STORY INJURIES AND ENHANCEMENTS

In the Star Wars universe, Darth Vader suffers from a multitude of serious near fatal injuries. As the character is a warrior that uses melee type weapons, mainly the fictional lightsaber, the injuries that the character has suffered were caused by armed melee combats with adversaries. As quoted by George Lucas, the director of Star Wars movies, in an interview with a Time magazine reporter on 25th April 1999, discussing the state of the character, "*Darth Vader was half machine, half man, and that's where he lost a lot of his humanity. He has mechanical legs. He has mechanical arms. He's hooked up to a breathing machine*" (Moyers, 1999).

The major injuries that Darth Vader has suffered can be classified into two types: physical and internal. During the battle with the Sith Lord Count Dooku, Vader (then Anakin Skywalker of the Jedi Order) lost one of his arms which was later replaced with a cybernetic arm that made it possible for him to continue his melee fight in following episodes. The cybernetic arm shown in Figure 6 is taken from an information website about the movie and the skeletal observation strongly suggests that Vader's left arm is substantially or entirely artificial, at least in the vicinity of the shoulder joint. Much of his left arm was severed when he lost his duel on Mustafar in the Star Wars Episode III movie.

In a battle against the Jedi Knight and Mentor Obi Wan Kenobi, Vader lost both his legs (replaced later with cybernetics) which lead to a near fatal accident when his body ignited due to the extreme heat from molten lava. As a result, most of his body was burnt and scarred. The internal injuries he suffered were also intended to be related to his appearance, outside and inside of the suit. His body armour and helmet are a cybernetic apparatus that supports his damaged body, mainly due to injuries related to spinal cords and amputated limbs, and provides Vader with the means to

support bodily functions affected by the injuries (such as breathing) while protecting him from outside elements. The armoured body suit also serves as a pressurized life support suit and gives the user more strength. The suit has a control panel near the chest, visible in the upper right corner of Figure 6. Two statements on this matter indicate that the severe injuries were supported by advanced technologies that work in unison with the character's body as an enhancement for an already affected state while also providing other functionalities:

> *Lord Vader has suffered a serious spinal injury near the base of his skull. This would sever the connection between brain and lungs, preventing the normal breathing reflex. For Vader to stay alive, his muscles responsible for breathing must be artificially controlled or else wholly replaced by machinery. Since Vader would be a quadriplegic without replacement of his broken spinal cord, he obviously requires some kind of nerve replacement and cybernetic control. […] Once sealed, Lord Vader's mask and armored suit can serve as an airtight spacesuit for at least a short time (Saxton, 2005).*

DISCUSSION

Darth Vader's injuries and their technological concepts created for the Star Wars universe have always been a plausible topic looking at the future, even before the movie was produced, but seeing it in the actual movie creates a more convincing influence, if not igniting real science to consider it as achievable. The most sophisticated ideas that were conceptualized from the sketches and designs are in the process of being refined or developed with modern science and technologies available today. The idea of replacing damaged or absent human organs with a synthetic replacement or even creating a multi-function suit to support the human body was not conceived only from what we see, but also from what we need. From the perspective of the creators of Darth Vader, fictional injuries and enhancements resulted in the form of design concepts and further on a real life fictional character. Vader's cybernetic prosthetics and armoured suit are a glimpse of future reality, because these technologies are being developed and used in the present time. A paragraph from a website discussing future cybernetic prosthesis development gives an indication on the level of current technologies. Figure 7 shows the tests done on Sørensen, who lost his left arm in a firework accident.

These ultra-thin, ultra-precise electrodes relay extremely weak electrical signals directly into Sørensen's nervous system. The electrodes were painstakingly designed in a way that they would continue to work even after the formation of post-surgery scar tissue. It also marks the first time in history that electrodes have been transversally implanted into the peripheral nervous system of an amputee (Dvorsky, 2014).

Another element of discussions referring to the aspect of science fiction has painted a vivid spectrum of possible futures, from cute and helpful robots (Star Wars) to dystopian (I Robot) robotic societies. Interestingly, almost no science fiction envisages a future without robots. George Lucas came up with *Star Wars* before we knew about extremophiles, which are life-forms that can live in bizarre or extreme situations. We were convinced that life was a fragile flower that could only develop if conditions were just right – it is the "Goldilocks" principle. Instead, we have found life-forms that can survive boiling and sub-zero temperatures or live deep underground with no sunlight. These types of conditions are probably not conducive to the development of complex, intelligent life, so a lot of life out in the universe would probably be rather primitive. According to Adam (2008), NASA is now developing softball-size robots – if you recall Luke's lightsaber training with the floating ball that shoots him in *Episode IV* – that float in zero gravity and manoeuvre with six fans. They can record temperature and pressure, can go into areas that are too dangerous for astronauts, and be like a canary in a coal mine.

But the main thing robots still lack is intelligence and emotion. There is still no existence of heroic robots like R2-D2 that take on risks, or skittish robots like C-3PO. Furthermore, C-3PO and R2-D2 play a critical role in 1977's blockbuster hit movie *Star Wars*. Throughout the movie, C-3PO served as an ambassador-like robot that is knowledgeable about customs, traditions and over 6,000,000 languages. C-3PO's companion robot, R2-D2, served as a mechanic, computer interface specialist and co-pilot for the film's main protagonist Luke Skywalker. Artificial intelligence is a major part of the most popular science fiction tale in the world, the *Star Wars* saga. Self-aware machines are all over the place, coming in all shapes and sizes, from tiny machines that display superfluous personality traits – like the "mouse droid" that squeaks and runs away from the imposing Chewbacca in the original film – to droid armies in the prequels, and the Laurel-and-Hardy duo of C-3PO and R2-D2. Researchers who are developing artificial intelligence are realizing that emotions are needed to make robots rational; that we usually think of these as being opposed to one another, but we need emotions in order to operate in a useful way. For example, people with frontal lobe disorders have trouble making decisions because, like computers, they go through every possible action before making a move. People with normal brains, though, have a feeling about a situation and that helps them to make a quick decision. Instead of blanket social acceptance or rejection, our relationship with A. I. will perhaps contain a mixture of both, with some people embracing intelligent machines as helpers, pets, or even friends, while others never really getting used to them.

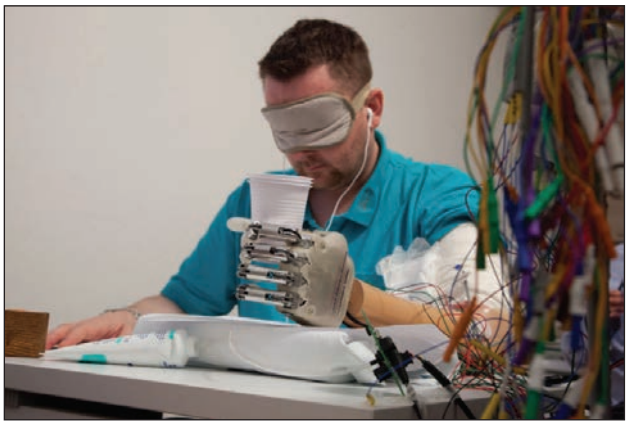

Figure 7: Future cybernetics prosthesis (Source: http://io9.gizmodo.com/this-cybernetic-hand-is-the-first-to--give-amputees-a-se-1516032204)

CONCLUSION

Even before Darth Vader's conceptual ideas, concept art has been a part of the film industry for a very long period of time. Many artists have gone through rigorous hours of work to design characters, environments, landscapes and creatures for their ideas to come alive on the big screen and for us to be entertained. Since then, hundreds of ideas have been conceived, but numerous new ideas for technology that were designed for futuristic characters can only be kept aside as current technologies are not capable of inventing them yet. It is evident that with Darth Vader's conceptual ideas, it is possible for scientists of the future to invent newer and better prosthetic limbs, viewing devices for eyes, breathing apparatus etc. that can help millions of people on a global scale.

Through Darth Vader's injuries we can analyse what kind of modifications were made to his body to support him and keep him alive, and these concepts stem from ideas of the writer and the artist who created this iconic character. Throughout the years, thousands of films and games are produced which can only mean that there is an endless amount of conceptual work done and that one day those ideas can be turned into inventions.

To conclude, we believe in the importance and impact of conceptual art on our daily lives and society. It would be wonderful if conceptual artists could work together with scientists in the future, and who knows what kind of impact this might bring for humanity.

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TEHNOLOŠKI NAPREDEK SKOZI OBLIKOVANJE FILMSKIH IN DRUGIH LIKOV: DARTH VADER KOT ŠTUDIJA PRIMERA

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POVZETEK

Pomen oblikovanja likov v filmih in drugih medijih bi lahko imelo posreden učinek na prihodnost konceptualne umetnosti, idej in tehnološkega napredka. Na podlagi zgodbe konceptualni umetnik oblikuje številne, celo na stotine različnih prototipov, preden mu uspe ustvariti končni izdelek, tj. filmski lik, okolje, vozilo, druga bitja ipd. Ti nato postanejo kultni liki, futuristično orožje in novi svetovi, ki nam predstavljajo zabavo na velikem platnu in nam namigujejo, kaj bo prinesla prihodnost. Namen te študije je bil približati idejo, da lahko konceptualna umetnost vpliva na znanost, na naša vsakdanja življenja in cel svet. Z analizo Dartha Vaderja iz filmske franšize Vojna zvezd kot glavnega predmeta, enega najbolj znanih negativcev iz kinematografske zgodovine, se raziskava osredotoča na proces pred-produkcije ter na to, kako lahko končni oblikovni izdelek vpliva na napredek v tehnoloških raziskavah s področja protetičnih udov, pripomočkov za dihanje ipd. Prav tako sta bila predstavljena proces nastanka konceptualne umetnosti in razumevanje arhetipov likov. Predstavili smo še druge dobro znane like iz treh različnih medijev (filma, računalniških iger in animacije) ter jih primerjali z Darthom Vaderjem z vidika podobnosti njihovih poškodb in modifikacij na njihovih telesih, ki bi lahko nekega dne postale resnični izum. Prav zato se te neposredno nanašajo na pomembnost oblikovanja filmskih in drugih likov.

Ključne besede: oblikovanje likov, konceptualna umetnost, Darth Vader, tehnologija, arhetipi likov

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