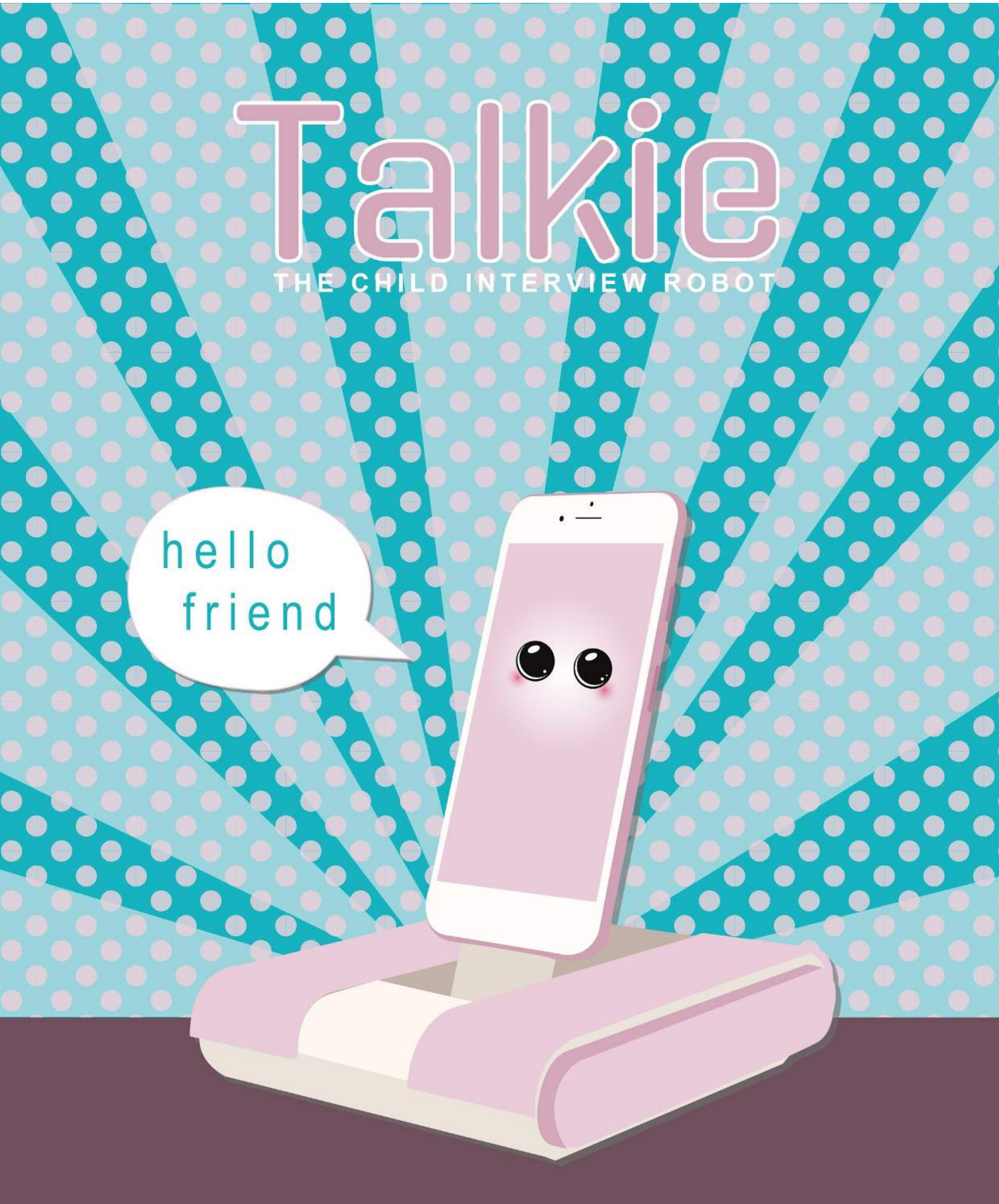
Talkie
THE CHILD INTERVIEW ROBOT
hello friend

Voice user interface in robots designed for children

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CONTENTS

1.0 INTRODUCTION

Humans and machines are becoming more and more alike, and as a result of this our technologies will acquire more autonomy and decision-making control. This can cause concern, and Japanese roboticist Masahiro Mori states that as robots become more human-like, people develop a sense of unease and discomfort (Lay, 2015). Research has shown that it is often adults who develop these negative feelings towards human-like robots, but what about children? A study published in the 25th IEEE International Symposium on Robot and Human Interactive Communication suggests that children were more willing to share details about bullying with a robot (Revell, 2017). The results of this study indicate that children do not develop negative feelings towards human-like robots and are more likely to share intimate information with a humanoid robot rather than an adult.

On the other side, putting a humanoid robot in charge of a child can cause a lot of controversy and reason to worry. Despite evidence that child-robot interaction in a variety of settings may benefit children, many people are concerned about the potential problems such technologies introduce, including risks to children's welfare and privacy (Pearson, 2020).

Our prototype Talkie, is a child interview robot, and the interaction style will involve the child responding where the system is proactive and initiates the conversation. Talkie is small, cute and toylike, and talking to Talkie will be much like telling secrets to their teddy bears. Talkie also has humanlike attributes like facial expressions, speech and movements.

Based on this I created the following research question: Exploring voice user interfaces and ethical dilemmas in robots designed for children, in the light of Don Norman's design principles and James Moor's machine ethics. Due to the extent of this paper I will explore the field and share my thoughts in developing the interview robot Talkie. In this essay I am going to explore the functions of voice user interfaces and have a closer look at the ethical dilemmas in the current version and a future scenario for Talkie.

2.0 HISTORICAL BACKGROUND

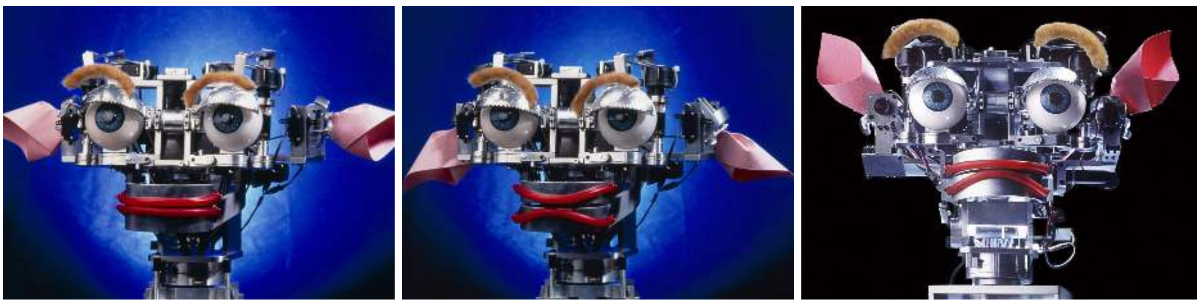
Putting a voice user interface (VUI) into a robot interface, allows the user to interact with a system through voice or speech commands, and it allows a hands-free, eyes-free way in which users can interact with a product while focusing their attention elsewhere (Interaction Design Foundation). Voice user interfaces is not a new concept, and in fact it existed long before graphical user interfaces (GUI), in voicemail, automated telephone operators etc. The difference is that today, voice user interfaces are available for everyone who wants to use the technology. According to Pearl, voice user interfaces are now in its second epoch (Pearl, 2019, p. 2). With assistens like Apple's Siri, Google Assistant and Cortana, which combines visual and auditory information, as well as Google Home and Alexa, voice user interfaces are now a well known and used phenomenon (Stene, 2019, p. 22). We are used to interacting with our devices, therefore interacting with a robot won't be that different. Talkie will interact with children, and even before the kids learn to read or write, they can use voice assistants which provide children with an easier way to interact with technology.

The first generation of speech systems earned a reputation for mishearing all too often what a person said (Sharp, Preece and Rogers, 2019, p. 224). Today they are more sophisticated and have higher levels of recognition accuracy. Machine learning algorithms have been developed that are continuing to improve their ability to recognize what someone is saying (Sharp, Preece and Rogers, 2019, p. 224). Speech synthesis has made the output more friendly and convincing, and are more pleasant to interact with than the artificially-sounding synthesized speech that was used in the early systems.

Speech synthesis is a crucial part of Talkie, for the conversation to feel natural, we want to implement this in the future, but as of now it has a Google Translate-voice. However Talkie is installed with Conversational AI, and it can be trained to engage in conversations in an array of different fields. For Talkie to be a humanlike-robot it has to be social, and it is social through speech, vision and movements. A key aspect of Talkie is that it is going to function as a friend, and the goal is for the child to feel like it's talking to a friend. Therefore how Talkie’s voice, script, looks and understanding of its surrings are, is really important for the prototype to reach its full potential. The first robot which is designed to perform social and emotional interactions with humans was Kismet.

2.1 THE EMOTIONAL ROBOT KISMET

Kismet is a robot developed in 1998 by a team of researchers at the MIT Artificial Intelligence Laboratory. Kismet is one of the first robots that is truly sociable, that can interact with people on an equal basis, and people accept it as a humanoid creature. It uses vision and speech as it’s main input, carries on conversations with people, and is modeled on a developing infant (Brooks, 2002, p. 65). Kismet uses human voice pitch to detect the emotional state of the person it's interacting with. In other words, feeling angry, sad, pleading and grateful all have distinctive pitch and loudness contours (Norman, 2005, p. 191). Kismet has the basic understandable intelligent behavior. It is based on the principle of felt autonomy, and has the basic mechanisms of turn-taking, with pauses, haze shifts, and awkward silence when the person interacting with it fails to speak. Therefore it feels natural to have conversation with the robot.



(Figure 1: Kismet has two eyes with foveal cameras which are hidden behind the human-like eyeballs. It also has two wide-angle cameras which are placed where the nose should be, and the ears are microphones (Rodney A. Brooks, 2002, p. 93). The three pictures show three different facial expressions - from left to right - Kismet is happy, sad and scared.)

When the team at MIT Artificial Intelligence Laboratory designed Kismet’s vocalization system, they addressed issues regarding the expressiveness and richness of the robot's vocal modality and how it supports social interaction (Expressive speech). Instead of achieving realism, the team implemented a system which matched Kismet’s appearance and capabilities. Kismet is able to have some sort of felt personality based on synthesis of voice, facial animation, and emotive expression.

The team of researchers at the MIT Artificial Intelligence Laboratory who developed Kismet worked on identifying acoustic features that vary with the speaker's emotional state (see figure 2). According to the researchers, emotions have a global impact on speech since they modulate the respiratory system, larynx, vocal tract, muscular system, heart rate, and blood pressure (Expressive speech). For example, if a subject is tired, bored, or sad, the parasympathetic nervous system is more active, and this causes a decreased heart rate, lower blood pressure, and increased salivation (Expressive speech). Typically their speech is slower, lower-pitched, more slurred, and with little high frequency energy.

The effect of emotions on the human voice

	fear	anger	sorrow	joy	disgust	surprise
speech rate	much faster	slightly faster	slightly slower	faster or slower	very much slower	much faster
pitch average	very much higher	very much higher	slightly lower	much higher	very much lower	much higher
pitch range	much wider	much wider	slightly narrower	much wider	slightly wider	
intensity	normal	higher	lower	higher	lower	higher
voice quality	irregular voicing	breathy chest tone	resonant	breathy blaring	grumbled chest tone	
pitch changes	normal	abrupt on stressed syllable	downward inflections	smooth upward inflectio ns	wide downward terminal inflections	rising contour
articulation	precise	tense	slurring	normal	normal	

(Figure 2: The effect of emotions on the human voice, accessed from http://www.ai.mit.edu/projects/sociable/expressive-speech.html)

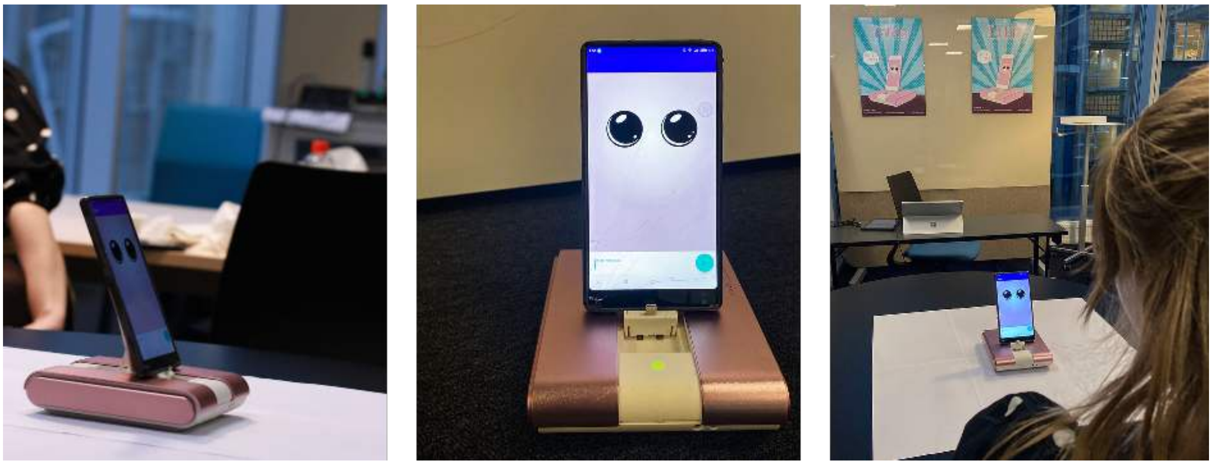
To achieve this level we need to implement artificial intelligence. Artificial intelligence started as a branch of computer science in the USA in the 1950s, and has had tremendous strength, and is a potential threat due to automation and robotics. The classical goal of artificial intelligence was established at a two-month seminar at Dartmouth College, USA in 1956. Some of the most famous who participated in the seminar was John McCarthy, Herbert Simon, and Marvin

Minsky. The goal was to use computers to s*imulate intelligent processes.* This is known as GOFAI - good, old fashioned Al. However it was Alan Turing's paper *Computing Machinery and Intelligence,* which introduced artificial intelligence as a field of research. In this paper Turing proposed an experiment known as the Turing test, which attempts to figure out if a machine can be considered «intelligent».

However, in recent years artificial intelligence has become a part of the technology we use everyday. Such as smart assistants, self-driving cars, autonomous vehicles and smartphones. Robots will also be included on the list in a few years and Talkie could be one of the robots working in the field. Just as Kismet is able to have some sort of felt personality based on synthesis of voice, facial animation, and emotive expression, Talkie also has some sort of felt personality based on speech, emotive expression and movements.

3.0 ROBOTIC INTERFACE

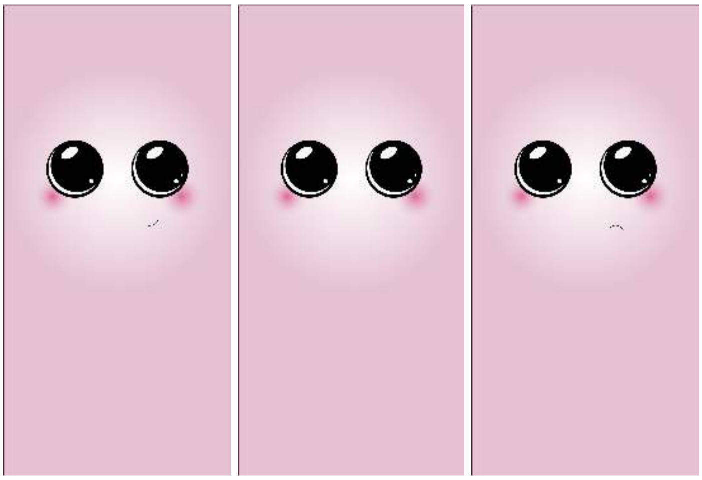
Talkie is a social interview robot that interacts, engages and holds a conversation with children, who consists of the PadBot T1 and an Android phone. Voice user interfaces use an interaction type of command or conversation, where users speak and listen to an interface rather than click on, touch, or point to it (Sharp, Preece and Rogers, 2019, p. 224). The data gathered from these interviews can be used in media production, such as documentaries or articles, but Talkie can also be used by investigators and psychologists.



(Figure 3: Photos of Talkie under the demonstration)

Interviewing children can be difficult and adults often find it uncomfortable to interview children who have been through abuse. Children have the tendency to say things they think adults want to hear, and are afraid of the consequences if they tell the truth. Will they be punished? Was it their fault? Instead of telling adults they confide in their stuffed animals or act if out on their toys. The interviews body language and word of choice can have a huge influence on the child's answer, and this might lead them to come up with false information, which can have fatal consequences. But this can only happen if the child says anything at all.

The purpose of Talkie is to engage a conversation with a child and make them feel comfortable enough to open up about sensitive topics. But in between the more serious questions, Talkie will be acting silly and make a more relaxing atmosphere in the room. Silly actions Talkie will be doing is for example, making fart-noises, telling jokes, initiating various games or show pictures or play music which are relevant to the conversation. This will establish trust between the two and Talkie will become a friend and the two will interact as companions. For the interaction to feel more natural we implemented a face to Talkie.

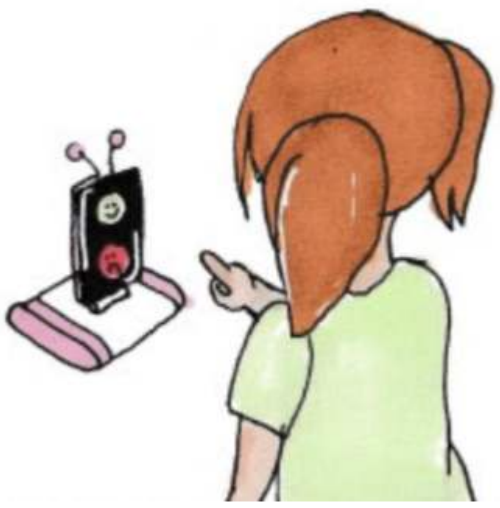


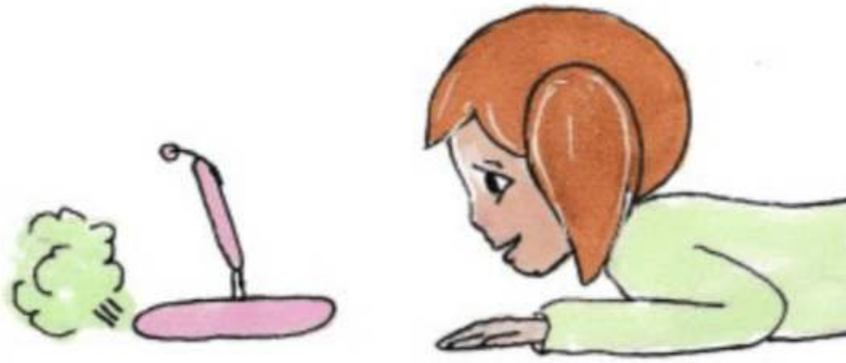
(Figure 4: The three pictures show three different facial expressions - from left to right - Talkie is happy, idle and sad.)

According to Sharp, Preece and Rogers, furnishing technologies with personalities and other human-like attributes can make them more enjoyable and fun to interact with, and they can also motivate people to carry out various activities, such as learning (Sharp, Preece and Rogers, p. 187, 2019). To design the robot even more humanlike we designed the face which resembles a human and different facial expressions. Anthropomorphism is the propensity people have to attribute human qualities to animals and objects (Sharp, Preece and Rogers, p. 187, 2019). For example, people tend to give nicknames to their technological devices or talk to them as if they were humans. Children accept and enjoy objects that have been given human-like qualities and that has changed the way we design, for example virtual agents, toys and robots. Talkie is more of a friend for the child, rather an investigator. The power dynamic is going to be completely different with Talkie and the child, rather a grown up and a child.

Talkie has an emotional system able to express different emotions with both facial expressions, movements and verbally. The emotions Talkie is able to express are idle, happy and sad. Based on this Talkie is able to sympathize with the child, and show emotional reactions to the child's response and behaviour. For example, if the child says it's happy, Talkie will respond with; «I am happy you are happy!» and give the child a smile and spin around joyfully. Communication between a human and a robot is strongly influenced by whether the human and the robot are in close proximity to each other or not. Talkie and the child will be co-located and interact physically in the same room - they will have a proximate interaction. Social interaction includes social, emotive, and cognitive aspects of interaction, and Talkie and the child will interact as companions.

Talkie is implemented with Conversational AI, and this enables the robot to engage in conversations in various fields. Conversational AI is the technology which makes it possible for humans to have conversations with computers. Conversational AI allows artificial intelligence technologies to interact with people in a humanlike way. Talkie has the ability to remember, and it makes communication between the two easy and natural. Talkie is also implemented with Natural language processing, which strives to build machines that understand and respond to text or voice data, and respond with text or speech of their own, in much the same way humans do (IBM Cloud Education, 2020). Natural language processing breaks down the sentences and looks for patterns it is trained to search for. Talkie is able to conduct a natural interaction with humans, and the conversation will be tailored to obtain the data they want to have from the child.





According to a research presented at the Conference on Human-Robot Interaction, robots could help children give evidence in child abuse cases (Revell, 2017). The stakes are very high in such cases. If an interview is poorly conducted it can end with getting the wrong person convicted, or sending the child back to an abusive environment. Cindy Bethel and Zachary Henkel at Mississippi State University say robots could reduce bias and lead to more reliable outcomes (Revell, 2017). In such cases, Talkie could use techniques like playing music, showing pictures and playing games, to make the child feel comfortable enough to tell the truth. Robots have the ability to monitor the child under the interview by using sensors to record body movements and facial expressions to pick up if the child is upset or feel unforgettable. But is there anything that justifies monitoring a child giving sensitive information to a robot? For the child's best interest the answer is yes. All of the parts invevold, no matter what scenario, want to get the truth. The dilemma here is how to know if the child is telling the truth. In the future Talkie would be implemented with a type of voice analysis, to find out if what the child is telling is the truth or not. Another scenario which can cause problems is if the child goes into playmode and tells a fictive story. These types of situasjon can acure, and this will be discussed further in the section of James Moor.

4.0 DESIGN PRINCIPLES

Donald Norman is Professor Emeritus of Cognitive Science at the University of California, San Diego. He has had enormous success as an academic author, consultant and industry leader. Norman's most influential book is «The Design of Everyday Things». It was first published in 1988, and a revised and expanded edition was published in 2013. Much of Norman's work involves the advocacy of user-centered design, with a focus on satisfying human and societal needs. According to Norman machines will become more social, talking with their owners, but also talking with one another (Norman, 2009, p. 158). For it to feel natural to a robot it has to have a humanlike voice, and this is exactly what we envision for Talkie.

Voice user interfaces have changed the way people interact with technology, and especially how children interact with technology. Interactive products must be easy to use, effective and fun to use from a users perspective. Robots are constructed with a set of rules it has to follow, and it is the human beings behind that decide the instructions the robot is to follow. As the designers of Talkie, it is important that we understand how children behave and are able to understand the robot. So how do we design an interface that is understandable for children?

In her master's thesis Sara Pedersen Stene established seven design principles to follow when designing voice user interfaces for children, and I will discuss some of them further along Don Norman's design principles.

4.1 FEEDBACK

Feedback is about the user receiving information when an action or task is completed, which allows the user to continue with the activity. Donald Norman explains feedback as letting the user know that the system is working on your request and communicating the results of an action (Norman, 2013, p . 23). Robots should be designed to provide feedback to the user that informs them what has been done, so they know what to do next in the interface. Don Norman's design principle goes hand in hand with Stene's principle that an interface has to listen and give feedback.

Talkie has various kinds of feedback available, but the most important are movemental and verbal feedback. When the child is interacting with Talkie it will be met with a variety of questions. Talkie is already installed with basic fun questions with answer options. When people are reading through visual content, it is possible to go back if you forgot something, but this is not the case with verbal content (Stene, 2019, p. 45). When designing VUIs for children it is important to keep the questions short and do not give too many alternatives. Therefore we chose to include two alternatives with different feedback.

Talkie: Hello, I am Talkie. What's your name?
Child: (name)
Talkie: Hey there (name)! How are you doing?

1. Sad
2. Happy

If sad
Talkie: I am sorry you have to go through this. Sending a virtual hug.
Talkie: Did that help?

1. Yes
2. No

If happy
Talkie: I am that you are happy! (Makes happy-movement and happy-face)

Talkie will change facial expressions depending on the child’s answer. If the child answers «happy», Talkie will smile, and if the child answers «sad», Talkie will show a sad expression. This makes the interaction feel more natural and comfortable. Talkie will also be making sounds depending on the child's answer and give the child feedback that it is listening and responding. The robot is installed with different movements depending on the input. A happy movement is spinning joyfully around, and a sad movement is going side to side. This type of feedback is letting the child know that the robot is listening and the task is completed. The idea of Talkie is that the interaction style will involve the child responding where the system is proactive and initiates the conversation. However Talkie is not able to start the conversation and the user has to touch the face to start, and for the robot to get input the user has to push «send».

For the future we want to improve the feedback even more by adding sound effects, such as music and fart-noises. By implementing these features, it is easier to keep the child's attention and gain their trust. By interrupting the conversation with sound effects or music, the child gets to process information and rest. All the performances Talkie is based on actuators, and is able to show emotion though movements with the help of actuators. All these kinds of good stimuli makes the child feel safe around Talkie. Another aspect I want to include is that the interface is designed where it can ask the child to ask again, by asking nicely, calm or rephrasing the question. Stene states that voice user interfaces do have an influence on children's behavior, and the interface has to understand what good behavior is and encourage it, before the children develop impatience and rudeness (Stene, 2019, p. 55-56).

4.2 CONCEPTUAL MODEL

Since Talkie will interact with other people, it needs to display emotions, to have something analogous to facial expressions and body language (Norman, 2005, p. 163). In other words, Talkie needs to have humanlike attributes. Facial expressions and body language are part of the «system image» of a robot, allowing the people with whom it interacts to have a better conceptual model of its operation (Norman, 2005, p. 163). When we interact with other people, their facial expressions and body language give us a clue that the other person understands what we are saying. We notice when people have difficulties by their expressions. The same sort of nonverbal feedback will be invaluable when we interact with robots (Norman, 2005, p. 163).

Today Talkie does show emotions through speech, movement and facial expressions, and it lets people understand and empathize with it. Talkie's face resembles a human face, and this makes it easier for a child to identify with the robot and see it as a friend, rather than a mechanical thing. Children accept and enjoy objects that have been given human-like qualities, and when designing a voice user interface for children it is important that the interface has a face. According to Stene a voice based interface, without visual presentation, can be experienced as weird for children (Stene, 2019, p. 56). By giving the interface a humanlike face, it will be perceived as more real and social. Talkie can also help children who have difficulties with communicating with others. The conceptual model underlying Talkie is quite visible.

4.3 SIGNIFIERS

Signifiers communicate where the action should take place, and provide the user with clues. People search for clues, for any sign that might help them cope and understand (Norman, 2013, p. 14). According to Norman the term signifer refers to any mark or sound, any perceivable indicator that communicates appropriate behavior to a person (Norman, 2013, p. 14).

Before interacting with Talkie the user has to get some instructions. The idea is for Talkie to engage the conversation, but the prototype does not do this at this stage. Therefore the user has to start the conversation and to do so, the user has to touch the screen, in other words touch the face, and say «hello». Talkie will then respond with «Hello, I am Talkie. What's your name?». After the user has responded to the Talkies question, it would have to push send for the robot to get the input.

But the interface does include clues for how to continue the conversation. We can compare it with interacting with your phone. It displays the same universal icons, for example the «send» icon. Most children who are grown up with technology will understand it because of these universal icons. In the future we want Talkie to engage the conversation, because this would make the interaction feel more natural, since it is the robot that wants to get to know the child, and not the other way.

The design of Talkie is also consistent. It has similar operations and uses similar elements for achieving similar tasks (Sharp et al, 2019, p. 29). The movements and facial expressions will be consistent and this will become a part of Talkies personality. Just like us humans. We have the same reactions, which includes movements and facial expressions, to different responses by other people. If we are happy we smile and have a high pitched voice. Movements towards different feelings can vary from person to person, and every individual has their own way of reacting, and just like Talkie.

4.4 AFFORDANCES

Affordances refer to the potential actions that are possible, but these are easily discoverable only if they are perceivable: perceived affordances (Norman, 2013, p. 145). The term affordance refers to the relationship between a physical object and a person (or for that matter, any interacting agent, weather animal or human, or even machines and robots) (Norman, 2013, p. 11). Talkie has to be able to learn and discover affordance, possible actions, in a changing environment and autonomously adjust to it. When Talkie moves around in a dynamically changing environment, it has to be able to find new possible actions, having a function-centered view on perception. When Talkie is interacting with a child in an environment it has to autonomously adjust to it.

In the future we want Talkie to act more autonomously and for example, if the robot sees a child crying, Talkie would go up to the child and take appropriate action, just like a human would. This is important because it ensures the child's well-being and amplifies the child looking at Talkie as a friend. Talkie should also learn from previous experiences and remember how to comfort a human crying. The robot will show sympathy towards humans and based on this Talkie will be perceived more as a human.

5.0 JAMES MOOR'S MACHINE ETHICS

James H. Moor is a professor in Dartmouth College's Department of Philosophy, Hanover, New Hampshire, USA. Moors 1985 paper entitled «What is Computer Ethics» established him as one of the pioneering theoreticians in the field of computer ethics. Computers are special technology and they raise some special ethical issues (Moor, 1985, p. 266). According to Moor, computer ethics is the analysis of the nature and social impact of computer technology and the corresponding formulation and justification of policies for the ethical use of technology (Moor, 1985, p. 266). Moor states that we cannot and should not avoid consideration of machine ethics in today's technological world (Moor, 2006, p. 18). As we expand computers' decision-making roles in practical matters they become more autonomous.

In the future social robots, like Talkie, can have a higher social status than humans and this is both a moral and ethical danger of new technology. Even though Moor's paper «What is Computer Ethics» came out 35 years ago it is still relevant because of such a concern.

5.1 MACHINE ETHICS

Can we teach a robot right from wrong? We want our robots to treat us right and not harm us, but how do we implement ethical behaviour in computational agents, and who should decide what is right and wrong for a machine? Robots are becoming more powerful, therefore putting ethics into a robot is becoming extremely important. Machine ethics used to be a topic reserved for science fiction (Alvarez et al, 2017, p. 2). Science fiction writer Isaac Asimov invented the Laws of robotics to make sure robots in his fiction acted ethically. He then proceeded to formulate three laws of robotics. As stated in I, Robot; 1) A robot may not injure a human being or, through inaction, allow a human being to come to harm. 2) A robot must obey the orders given it by human beings except where such orders would conflict with 1). 3) A robot must protect its own existence as long as such protection does not conflict with 1) or 2) (Asimov, 1950, p. 9). These laws are of limited use for practical machine ethics, they have still had a notable influence on the research field (Alvarez et al, 2017, p. 2).

5.2 THE AGENTS

Computing technology has agency. According to Moor we expect programs, when executed, to proceed toward some objective, for example, to correctly compute our income taxes or keep an airplane on course (Moor, 2006, p. 18). Viewing computers as technological agents is reasonable because they do jobs on our behalf (Moor, 2006 , p. 18). Looking at Talkie as an example, it's purpose is to interview children about sensitive topics, essentially doing the part of specialists.

Talkie will do the job that specialist has done for many years, which means that Talkie would be some kind of expert system. For example, imagine you have a child who has been through abuse, and are being interviewed by an investigator to find out who has done it. In such cases the interviewer often focuses on asking the right question, without worrying about their delivery, but robots like Talkie would be able to conduct the whole conversation (Revell, 2017). In other words, it is possible to have increased control over the speech, vocal prosody, facial expressions, and body movements of the robot (Henkel and Bethel, 2017, p. 14). A human interviewer is also more likely to succeed at misleading a child than a robot interviewer. The child interviewee will notice if the human interviewer is uncomfortable during the interview, which can affect the child's answer. Interviewers find it difficult to talk to children who have been abused. Robots don't (Revell, 2017). Talkie would essentially be better at talking to children than humans.

But if we can put ethics into a machine, and can a computer operate ethically because it's internally ethical in some way? (Moor, 2009, p. 19). The answer is yes, and Moor distinguishes between three levels of autonomy: implicit ethical agents, explicit ethical agents and full ethical agents.

5.2.1 IMPLICIT ETHICAL AGENTS

An implicit ethical agent is an agent that is programmed to act ethically, this is done by programming it in a way where the robot does not act unethical. These agents are constrained by the engineers to avoid unethical outcomes, but there are otherwise highly systematic, efficient, safe and reliable (Moor, 2016, p. 19). According to Marija Slavkovik implicit ethical agents are autonomous systems that do make moral decisions, but they do so by following constraints specified by a human operator (Slavkovik, 2018, p. 3). Implicit ethical agents are often used in Mini Banks for transactions involving cash and the autopilot in an airplane.

Talkie could be seen as an implicit ethical agent, for example if it were to be implemented into a courtroom as a witness. The robot would then be handled with care because of the information it has gathered. In accordance with Moor, Talkie would then free many of us from monotonous, boring jobs (Moor, 2016, p. 19). Not to mention, ethically difficult jobs. The experts would be free of interviewing the child, and maybe in the future not have to present the information in the courtroom. If this were to be realized, Talkie would have to be implemented with a line of code telling it to not interrupt other people and be quiet when others are talking.

5.2.2 EXPLICIT ETHICAL AGENTS

These agents are autonomous and can handle real-life situations involving an unpredictable sequence of events (Moor, 2016, p. 20). Explicit ethical agents can make ethical decisions because they are programmed for it. These agents use their previous experiences to make the right decision. Humans often have difficulty being rational and effective, but these agents do not. According to Moor when confronted with a complex problem requiring fast decisions, computers might be more competent than humans (Moor, 2016, p. 20). This makes a parallel with what Dreyfus says about the human. The reason these decisions could be ethical is because they would determine who would live and who would die. Some might say that only humans should make such decisions, but if (and of course this is a big assumption) computer decision making could routinely save more lives in such situations than human decision making, we might have a good ethical basis for letting computers make the decisions (Moor, 2016, p. 20).

If Talkie were to reach this kind of agency, it would be able to handle unexpected information from a child and take a better solution than a human. For example, a scenario is of Talkie interviews a child who's been through abuse, Talkie would be programmed so it could give the child comfort and ask a followup question without judging or making them feel like it's their fault. Talkie would also know what games to play afterwards and by that know how to cheer up the child.

5.2.3 FULL ETHICAL AGENTS

Full ethical agents can make fully ethical decisions and justify them. These agents have consciousness, intentionality and free will (Moor, 2016, p. 20). They can make explicit ethical judgments and generally are competent to reasonably justify them (Moor, 2016, p. 20). The only real examples so far are humans, but in fiction films there have been full ethical agents for decades, for example «Hal» from 2001: A Space Odyssey (1968). However the social humanoid robot Sophia is our most developed AI-robot (Hanson Robotics, 2020). Sophia is programmed with an unique personality, understanding of speech and expression, conversation and empathy. She is a prime example of a full ethical agent and how far we have come within artificial intelligence. So is there a possibility for Talkie to become a full ethical agent?

Yes, we have come so far in the research of artificial intelligence so there is a possibility Talkie can become a full ethical agent in the future. But to ignore the ethical component of machines is a mistake, even though they may not be full ethical agents yet, but we have to learn and prepare. Many advocates argue that a bright line exists between the senses of machine ethics discussed so far and a full ethical agent, and a machine will never cross that line. The bright line marks a crucial ontological difference between humans and whatever machines might be in the future (Moor, 2016, p. 20). According to Moor the bright-line argument can take one or both of two forms. The first argument is that only full ethical agents can be ethical agents, but to ignore the ethical component of ethical-impact agents, implicit ethical agents, and explicit ethical agents is to ignore an important aspect of machines (Moor, 2016, p. 20). Some are bothered that the ethics of the lesser ethical agents is derived from their human developers, but Moor states that this doesn't mean that you can't evaluate machines as ethical agents.

The other form of bright-line argument is to argue that no machine can become a full ethical agent - that is, no machine can have consciousness, intentionality, and free will (Moor, 2016, p. 20). According to Moor we won't resolve the question of whether machines can become full ethical agents by philosophical argument or empirical research in the near future, we should therefore focus on developing limited explicit ethical agents (Moor, 2016, p. 21). They would not be full ethical agents, but they could prevent machines from acting unethical.

As i mentioned, interviewers find it difficult to talk to children who have been abused. Robots don't (Revell, 2017), and that would make Talkie better at talking to children than humans. But this requires that Talkie can analyze and know for sure when the child is telling the truth or not, like a kind of lie detector. It is important that Talkie has these abilities because since the robot plays games most of the time, children might think they are still playing when Talkie asks a serious question which could result in the child saying things that are not true. Like humans, we do not always know if a child is telling the truth or not, but if Talkie is going to be better at humans to talk to children, this is an essential part.

Talkie would also know which questions to ask and when. Make fully ethical decisions, which benefits both the child and the investigation. Talkie would notice if the child does not trust it yet or feel uncomfortable. Then the more serious questions would wait, and their first meeting would consist of playing. The robot knows better how to talk and act around children, rather than a human.

Moor also states that we can't be too optimistic about developing explicit ethical agents, because of our lack of knowledge and we need to understand learning better than we do now. Moor also argues that inadequately understood ethical theory and learning algorithms might be easier problems to solve than computers' absence of common sense and world knowledge (Moor, 2016, p. 21).

Talkie, and other machines can become full ethical agents, but the question is when. Programming a computer to play world-champion chess took 40 years, and programming a computer to be ethical is much more complex. Programming a robot who is conscious and has free will and has the capability to say whatever it wants. Talkie has speech as the main information channel, and this is something that is very natural in human communication. However, when on the other end of the line is not a human but a piece of software, things become more complicated (Regeni, 2019). Talkie communicate with speech, facial expressions and movements, but it is a challenge if a machine looks at you with care because we look at machines as mechanical things. Anthropomorphizing voice interactions can bring Talkie and the child closer, but the conversation can become awkward if we don’t find the right amount of human traits sufficient for such a device (Regeni, 2019).

6.0 CONCLUSION

In this paper, I explored voice user interfaces for children in robots, in the light of Don Norman’s design principles and James Moor’s machine ethics, exemplified with the child interview robot Talkie. Human interactive systems are always challenging; this robot is a prototype which aims at shedding some lights on how far we can design a robotic interface and the use for it. We are able to design a universally inoffensive personality, and full ethical agents in the future, but still have a far way to go, at least if the robots are going to act ethically. According to Moor we have to get more knowledge within the field. If I were to make this robot in the future, it would need a lot more research and understanding.

7.0 LIST OF LITERATURE

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