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HUMAN-MACHINE COMMUNICATION: ETHICAL PERSPECTIVES

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Panel overview

Digital voice assistants, social robots, artificial intelligence and progressively refined algorithms are ushering in new modes of interaction that increasingly mediate between human and machine. This panel will engage ethical questions related to those modes of interaction, ranging from discussion of automated journalism to virtual performers, digital research assistants to toys. The central concern among the papers to be presented is to probe the nature of the relationships forged between humans and machines when the latter are interlocutors and creators and not merely passive recipients of data through interaction. What new ethical issues are emerging as machines create journalism, as they create music and interact in performance, as they engage in research, as they become a part of childrens' social circle?

These questions are distinct from, but incorporate, some of the discussions and interventions that have been taking place regarding artificial intelligence (Gunkel, 2012), machine learning (e.g., Seyfert & Roberge, 2016) and algorithmic bias (e.g., Beer, 2019). Research in these areas has generally considered traditional forms of interaction, such as those via keyboard, text, camera and screen, but new modes of

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interaction are occurring with devices that seek to be vocal, photorealistic, robotic, and that seek to foster interactions that can build relationships over time in increasingly anthropomorphic fashion. Research in this area needs to be extended to consideration of the *performative* aspects of human-machine communication, and that focus is what ties these papers together. Rather than consider the interactions between human and machine as isolated occurrences or mediated communication, as transmission, the aim is to examine human-machine communication as *ritual*, as occurring within existing contexts of communication and interaction that carry multiple, dynamic cultural meanings and values (Carey, 1989). From such a perspective the ethical considerations both become more clear but also more complicated as they are situated within larger contexts of culture, history and meaning-making.

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1. SHOULD MACHINES WRITE ABOUT DEATH? ETHICS IN AUTOMATED JOURNALISM

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This presentation examines the philosophical and theoretical challenges of the ethics of automated journalism. It traces current approaches to journalism ethics that are primarily grounded in existing standards for human journalists and emerging efforts to address the shift in the role of technology in the journalism process from channel to “author.” Taking the question, “Should machines write about death?” as provocation, I argue that existing journalism research and professional codes fall short in addressing the complication that machines as communicators pose to the ontological assumptions underlying journalism ethics. I advocate for journalism and media scholars to engage with scholarship within Human-Machine Communication (HMC) and philosophy of technology to progress journalism and media ethics in a way that is responsive to the changing nature of technology.

Provocation: Should machines write about death?

Automated journalism is the use of news-writing software to develop stories from data (Carlson, 2015). This software, adopted into news organizations worldwide, develops reports, such as stories regarding sports or crime, from raw data, such as game or crime statistics. Initial research has found that readers cannot distinguish between basic reports written by humans and machines (e.g., Graefe et al, 2018). During a discussion regarding automated journalism and its applications in a course I teach, some students remarked that these programs should not be used to report murder because doing so would be “disrespectful.” It is disrespectful to the victim and their family because a machine would be writing about a deeply personal and human event. Other students countered that there could be advantages to software producing stories about death, such as a decreased likelihood of mistakes within the story.

Emerging ethical questions and guidelines

Considering the provocation that emerged from the student discussion, I first turn to emerging research and professional codes regarding the ethics of journalism automation. Experts have relied upon standards that preceded news-writing software to identify ethical issues regarding automated journalism, including bias, accuracy, and transparency (e.g., Dörr & Hollnbuchner, 2017). For example, the edicts of ethical journalism require journalists to act in a transparent manner, avoiding conflicts of interest and being forthright in their conduct. The transparency standard mapped onto automated journalism requires journalists to disclose the use of news-writing software to the audience (e.g., Montal & Reich, 2017). Regarding bias, media are advised to understand the potential for bias within the design of the software more generally and the data being fed into it so as to avoid reproducing such biases (e.g., Ananny, 2016). The focus regarding the ethics of automated journalism has been on integrating this

software into the newsroom in ways that uphold existing standards for content and are transparent about the technology's use.

Missing from discussions regarding the ethics of automated technology is debate regarding whether news-writing software should be adopted or in which contexts: Such questions have been approached primarily as technological issues. Ethical considerations enter into the technological debate when questions exist regarding whether the software can produce content that meets ethical standards (i.e., accurate, objective). An indirect answer to the provocation, therefore, could be found in weighing the degree to which the software produces accurate stories about death. However, emerging standards cannot provide guidance regarding the question of whether it is "disrespectful" for machines to write about human death.

Ontological challenge to journalism ethics

Next, I explain why initial research and emerging professional codes cannot fully address the provocation. Ethical standards regarding automated journalism are largely silent regarding whether machines should write about death because at issue is the nature of the machine as "author." It is a question of who, or what, is producing the content or, in communication terms, the communicator, rather than a quandary regarding the content, or message, which has been the focus of emerging standards.

Communication theory historically has been based on the ontological assumption that within the process of communication, people perform the role of communicator and machines occupy the role of mediator. Communication and journalism ethics have been grounded in these same ontological assumptions (Gunkel, 2018). In developing codes of ethics prior to the introduction of AI and algorithms, experts did not have to give consideration to the ontology of the communicator because it was assumed to always be the same, a human. The focus of journalism ethics was on developing standards for content and guidelines regarding people's actions relative to those standards. Adapting these codes to automated journalism has not resulted in consideration for the ontology of the news producer because such consideration was not initially part of these codes. What is needed to fully address the question of machines writing about death and similar questions based upon the nature of the communicator is for scholars to more firmly grapple with the ontological nature of humans and machines and their shifting role within communication.

Human-Machine Communication & Philosophy of Technology

Lastly, I explain how scholars can draw from Human-Machine Communication (HMC) and philosophy of technology to meet the challenge of automated technologies for the study of journalism ethics. As argued by Lewis et al. (2019), HMC is an emerging area of research that offers a theoretical starting point for understanding the shifting roles of humans and machines in journalism. In contrast to scholarship focused on people as communicators, HMC examines the role of machines as communicators and the implications thereof. While HMC can help scholars better understand technology as communicator, rather than mediator, a second body of work is needed to assist scholars in thinking through the shifting nature of humans and machines, and here I point them to

philosophy of technology. Among its many different lines of inquiry, the multifaceted field of philosophy of technology examines what technology is and the nature of humans and machines relative to one another (Mitcham, 1994). Working through the relevant literature in both bodies of scholarship will enable scholars to better identify and address ethical questions regarding not only existing technologies of journalism automation but also the AI-enabled applications yet to come.

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2. PEPPER'S GHOST AND THE ETHICS OF AUGMENTING REALITY

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Pop music stages around the world are being colonized by the digital dead. Within the last decade, “holograms” of numerous deceased pop stars — including Michael Jackson, Roy Orbison, and Ronnie James Dio — have had their images, personas, and estate incomes resurrected via a technical display that revives a novel mode of mediated performance: projecting life-sized, seemingly 3D imagery of human bodies that appear to be screenless and present in the same space as the spectator. What are the particular messages of this medium? What, aside from the memory of a dead person, might these rituals be reviving? This paper considers contemporary “hologram” performances amid existing scholarship around augmented-reality (AR) technologies. I argue that “holograms,” broadly defined, reify and enhance essentially ideological and haunted aspects of modern media. I bring a historical case to bear on this “new” phenomenon in order to surface similarities in technical function and audience reception that should be highlighted by future scholarship around these performances.

The medium is the ideology

In 2012, Tupac Shakur appeared at the Coachella Valley Music & Arts Festival — a performance notable chiefly because the late rapper had been shot and killed 16 years earlier. Shakur’s image had been digitally revived, refreshed, and reconstituted as a new technical projection onto a transparent onstage screen, where it appeared to be a present body in proportion to and duetting with human co-stars. Shakur’s appearance had been promoted as a secret guest star — as a *person*, not a media system. Responses to the initial performance (as recorded in audience tweets within the first 24 hours after the concert) conflated the spectacle as both a mediated image (“that Tupac hologram”) and as a more embodied aspect of presence — as a person (“that man is fine!”), as an uncanny figure (“call him Zombie Tupac”), and as a specter (“I saw the ghost of Tupac perform”). Most responses also described the phenomenon using discourses of futurism and novelty.

The technical assemblage presenting these performative phenomena is a barely modified version of a stage illusion made famous in the mid-1800s called Pepper’s Ghost. The original illusion arranges actors, lights, and mirrors in order to reflect the image of a person into a separate space, as if that person were present instead of absent; the 21st-century version merely substitutes digital projection and Mylar to achieve the same effect. The illusion succeeds only if its technics are hidden, purposely performing the interaction as “live” and interpersonal rather than an encounter with a mediated image-object. Pepper’s Ghost became a popular theatrical device after its 1862 debut, but the illusion was not developed in the context of stage magic or popular entertainment; rather, it was refined at a museum of science, the Royal Polytechnic Institution in London, in direct support of the institute’s rigorously ideological mission of social engineering. The Polytechnic sought to educate Britons in the ways of being modern, which meant promoting discourses of Enlightenment rationalism and technoscientific superiority. The namesake of Pepper’s Ghost, John Henry Pepper,

seized upon the technical illusion and performed it *without* the intent to deceive; Pepper purposely revealed the illusion after each performance, thus demonstrating to audiences a rational and natural explanation for seemingly supernatural experiences. Pepper's change of intent, however, merely reversed the visible and invisible aspects of the experience, making clear its material origins while obfuscating its ideology.

Media and the spectral U-turn

This paper examines these historical origins of Pepper's Ghost in order to interrogate its reemergence in the 21st century as an interaction haunted by both the ghostly content of its messages and the ideological potential of its medium. First, the technical imagery of this illusion constitutes an early iteration of AR display. The broader concept of reality augmentation has been likened to the imposition of social discourses. Slavoj Žižek claims that AR tech simply "externalizes ... the basic mechanism of ideology" and that "at its most basic, ideology is the primordial version of 'augmented reality'" (Žižek, 2017, p. 114). This is precisely how Pepper viewed the presentation of his ghost, and present-day spectators should consider this particular messaging potential inherent to the medium. I connect these evaluations through the communication philosophy of Vilém Flusser, who not only frames these visual phenomena within a specific knowledge-production category called "technical imagery" but who evolves traditional apparatus theory beyond cinema to apply its ideological structures within the situated contexts of digital and virtual experiences (Flusser, 1984, 2011).

Secondly, the technical imagery in these presentations constitutes a mediated, ritual haunting. The "spectral turn" within cultural studies has furthered the modern project of transforming ghosts from supernatural entities into conceptual metaphors (Blanco & Peeren, 2013; Gordon, 2008) and communication scholars have examined media's spiritualist origins and occult nature within largely metaphorical framings (Carey, 1989; Peters, 1999; Sconce, 2000) — film *seems* ghostly, radio sounds *like* a haunting voice. I argue that these "holograms," broadly defined, boost this spectral signal, reifying and concretizing essentially haunted aspects of modern media. The slightly transparent imagery of a "hologram" body doesn't just *seem* spectral; it appears to be present before a spectator in many of the ways common to descriptions of spirits and specters across worldwide cultures, in which ghosts are not uncanny ideals but present, material actors. Contemporary "holograms" call for a spectral U-turn, retreating from metaphor to reconsider the imagery anew as an embodied social actor. This discussion does not ask whether we believe in ghosts but, rather, what we might be led to believe when we see actual ghosts.

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3. ROBOT, WHAT DO YOU FEEL? ETHICAL DESIGN OF RELATIONAL ROBOTS FOR CHILDREN

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Introduction

The Internet of Toys, a part of the Internet of Things, is gaining momentum (McReynolds et al., 2017). Along with smart sensors and the internet connection, some of these toys benefit from more advanced versions of robotic technologies. The fascinating emotional expressiveness of the Anki's robot Cozmo shows the ambition of this industry. Moreover, the pioneers of the field of social robotics often used the relatively simple electronic toys – Tamagotchi, Furby and AIBO – to illustrate their theories (Breazeal, 2002). Thus, the Internet of toys represents the first step towards the industry of social robots for children (Peter et al., 2019).

Social robots are being developed for long-term emotional communication with children (Breazeal et al., 2016) and are often designed to take human roles: friends, assistants, teachers, babysitters, etc. A trend can be noticed of integrating robots into children's early social circles. Robots like Kaspar already help children with autistic spectrum condition develop their social skills (Wood et al., 2019). There are also a number of projects with robotic tutors (Vasagar, 2017). Early childhood is a period of rapid social and emotional development, when children exercise prosocial behaviors (Hoffman, 2000; Eisenberg et al., 2016). Setting robots in roles meant for humans creates a precedent of potentially acquiring social and emotional skills from communication with machines. If we allow robots being used in such roles as teachers, babysitters, peers and caregivers, how should they then be designed? And can they be designed so?

The topic of this presentation is ethical design of social robots for empathic communication with children. I am searching for the necessary components, which should be present in the design of social robots so that children could still develop empathy when communicating with them.

Theoretical framework

One of the main social skills that children develop in early childhood is empathy – the ability to feel the similar feelings to another and to understand those feelings without getting overwhelmed by them (Spinrad & Eisenberg, 2017, p. 2). Despite the arguably significant genetic predisposition (Knafo & Uzefovsky, 2013), children develop empathy from the first days of life and until at least the age of 12 in social interactions with early stable contacts: parents, peers and teachers (Heyes, 2018). Empathy consists of affective and cognitive components, which are two separate systems in the brain (Shamay-Tsoory et al., 2009). Affective empathy develops as a result of early emotional contagion until the age of 2 (Coplan, 2011, p. 46), while cognitive empathy depends on the learned associations between the external emotional expressions and internal states: feelings, intentions, goals, desires, preferences, etc. (Decety et al., 2017, p. 6).

This learning happens gradually as a result of the process of role taking, mainly during cooperative peer play, which starts approximately when children enter pre-school (Brownell et al., 2002).

Computational empathy is a relatively new area in robotics, which works on modeling empathic behavior in machines. Paiva et al. (2017) and Yalçın and DiPaola (2020) have provided extensive reviews on the current state of the field and found three main methodological approaches: analytical, empirical and developmental.

Human-machine communication (HMC) field of communication studies allows for regarding technology as a communicator instead of a medium through which the message is transmitted (Guzman, 2018). I discuss empathic child-robot communication as a case of interpersonal communication, where one of the communicators is a social robot simulating empathic behavior.

Method

In order to identify the necessary components in robots for empathic communication with children, I review the theories of empathy development from psychology and neuroscience to operationalize the empathic behavior needed for the normal development of empathy. Then I analyze the current computational theories of empathy from the perspective of their sufficiency for providing a satisfactory empathic communication to be used with children.

Results and discussion

Human social interaction is indispensable for the development of empathy in children, because it provides enough warmth and care for the emotional contagion, and human behavior is more complex and flexible to provide enough training material for role taking and, consequently, the development of cognitive empathy. The current computational models of empathy rarely use comprehensive empathy models. Moreover, these models are only tested in short-term, restricted laboratory contexts, and their evaluation measures include: the quality and adequacy of expressed emotions, believability, social presence, friendship, anthropomorphism, and perceived intelligence (Paiva et al., 2017, p. 33). To provide a satisfactory level of empathic communication when used with children, the robots should be equipped with such features as: biographical storytelling, which allows for sharing individual preferences and personal history; expressions of rich emotional palette through social cues (face, gestures, verbal, body language); intentional behavior; behavioral routines for maintaining long-term relationships; and the demonstration of memories of the relationship with the child.

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4. THE ETHICS OF SOCIAL ROBOTS IN RESEARCH

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It is already clear that data is being collected from humans with and through computers and other devices. Will the rapid dissemination of sensors, microphones, cameras, and other “Internet of Things” (IoT) devices usher in an age of ubiquitous data collection? This paper examines the consequences of using emerging technologies to collect types of data traditionally used in social science research. Advances in technologies in the realms of artificial intelligence (AI), robotics, human augmentics, and machine learning portend significant changes to the practice of social science.

Data Collection & Automation

Scholars have long documented and discussed that myriad technologies collect data about users (Amoore and Piotukh, 2016). While such techniques are common in the private sector as a means to target individual users for messaging and marketing (as was made most clear in 2018 news reports about the Facebook and Cambridge Analytica controversy) it is not clear that academic researchers are availing themselves of such techniques for social science research, nor whether such techniques are readily available to them. They are, however, available at least to some extent. Indeed, the Cambridge Analytica controversy had at its inception a Cambridge University psychology professor who built an app that, with Facebook’s permission, collected data from a personality survey. (That data was subsequently shared with Cambridge Analytica, a private political consulting firm, contravening Facebook’s data sharing policies.) The majority of the data collected through such efforts, likely all of it, is textual, encompassing user profiles, postings, location and click-throughs. It would not be surprising to learn that the data included audio and/or video recordings, as well as location over time (via mobile data, wi-fi, or even Bluetooth beacons).

There are existing technologies that could expand on the type of data collected. Eye tracking has long been used in industry and academic research. Use of devices like Microsoft’s Kinect could enable collection of gestures and movements. Augmented reality (AR) enabled devices could collect data via facial recognition. And, with devices like Microsoft’s HoloLens, which incorporates a rudimentary form of emotion recognition, users’ emotional states could be recorded. Deb Roy used some of these techniques in the 2000s to study language development in children, deploying numerous cameras and microphones in his own house to capture his child’s development of language (Roy, *et al*, 2006). In that scenario technology was used entirely for surveillance and not for interaction but it would now not be easy to imagine such technology in the home as an interlocutor thanks to devices like Amazon Alexa or Jibo. Indeed, instead of an app like the one employed by the Cambridge University researcher, might one imagine a digital assistant, like Alexa, Cortana, Siri, or Jibo, collecting data? Furthermore, might one imagine a robot collecting data? Empathic robots, such as those envisioned by Stahl and colleagues (Stahl, *et al*, 2014) in an essay on responsible research innovation, may also collect physiological, Internet of Things (IoT) and gesture data (see, *e.g.*, Pu and colleagues’ description of a gesture recognition system that enables whole-home

sensing and human gesture recognition via Wi-Fi signals (Pu, *et al*, 2013)). These types of questions are at the heart of what this paper hopes to engage.

Research & Labor

Indeed, important elements that were technologically not feasible to implement ten years ago, like clear speech synthesis and natural language processing (NLP), have in the meantime become widely available. It is not difficult to imagine that digital assistants could be used as interviewers that could undertake survey or focus group tasks, or otherwise engage in research involving speaking with human subjects. Intelligent agents are already employed for this purpose in customer service roles via telephone and web chat. The demonstration of Google Duplex in May, 2018 at Google's developer conference showed just how well a digital interlocutor can mimic human conversation (and showed just as well its potential for deceit) and there is no reason to think it could not be put to use as a type of digital interviewer.

It is also not difficult to imagine rolling together all of, or some combination of, the aforementioned elements, from facial and emotion recognition to location tracking (macro and micro) to NLP to speech in a social robot that can act as a researcher, or, at least, as a digital research assistant (DRA). Considering that social robots interact with humans in novel ways it is worth opening a debate about the use of technology as a researcher. Where does one draw a line between the researcher and the researcher's digital assistant?

The question of DRA analysis of data begs yet another question, namely the ownership and security of what could be private, indeed intimate, data, and deductions made from it. Particularly in the case of analyses of the data it is important to consider the locus of responsibility for consequences of computer and algorithm-driven research. Would a DRA be responsible, for instance, for lines of critical questioning devised by its algorithm that could cause emotional harm to a human subject with which it was interacting? Or would it be the developer of the DRA, or developer of the algorithm, or...? It is not a simple matter to determine the locus particularly if a DRA is developing its own research threads by way of machine learning.

Conclusion

The title of this paper is meant to be provocative; it would have been simple to alter it to "Can social scientists use social robots?" and describe the many ways that they could. Ethical issues would still arise and be important to consider. But we are very close to, if not past, the point that machines could engage in what are rather typical activities in which social scientists engage. The provocation is not meant to be simply or merely a thought experiment but rather a call to critical discussion and debate.

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