THE DEATH AND LIVES OF HITCHBOT: THE DESIGN AND IMPLEMENTATION OF A HITCHHIKING ROBOT

David Harris Smith, Department of Communication Studies & Multimedia, McMaster University, Hamilton, ON, 8LS 4L8, CA. Email: <dhsmith@mcmaster.ca>.

Frauke Zeller, School of Professional Communication, Ryerson University, Toronto, ON, M5B 2K3, CA. Email: <fzeller@ryerson.ca>.

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Abstract

In the early morning hours of 1 August 2015, as it waited for its next ride on a Philly park bench, unknown assailants destroyed *hitchBOT*. Arms torn from its body, legs broken, gutted of its electronics, it was left discarded in a park, minus its smiley-face LED head. Around the world headlines announced the death of a much-loved robot, children and adults shed tears, haters hated on Philadelphia, cartoonists and musicians paid tribute, journalists wrote obituaries and the publicly minded rallied to support a rebuild. The authors share the story of the life and times of their creation, hitchBOT the hitchhiking robot.

We first conceived of hitchBOT amidst speculation about sending an unaccompanied robot into the world to engage in unconstrained interactions with humans. Although the idea uniting hitchhiking and robotics came to us in an inspired flash, many months had gone into developing the creative possibilities of *cultural robotics* [1]. Bridging the STEM and arts disciplines, this field of research-creation seeks to stimulate public engagement with the cultural issues of emerging AI and robotic technology. In the case of hitchBOT, we invited reflection upon public safety and robots by inverting the popular dystopian question of whether we can trust robots, asking instead "Can robots trust humans?"

It is in response to a general apprehension about the future of human-robot coexistence that we imagined a creative application of robotics and AI, an artificial wanderer and, in particular, one that could ironically assume the risks and fears associated with hitchhiking. As a performance artwork we intended hitchBOT to stimulate reflection on social trust and empathy, and hopefully, to launch some collective, cooperative play with a robot.

Designing hitchBOT

Our objective for hitchBOT was that it would travel unaccompanied by us, or members of our research team, therefore the robot needed to incorporate design features that would facilitate nonexpert interactions and maintenance. Our first consideration was to signal that the robot was nonthreatening and playful. For this we employed what we call a "yard-sale" aesthetic, making use of common household items, such as a plastic bucket for hitchBOT's torso, an acrylic cake-saver for its head, reinforced pool noodles for arms and legs and rubber gloves and boots for its hands and feet. The addition of an animated LED face and servo-mechanism to periodically raise its hitchhiking arm further grounded hitchBOT's somewhat comical form in anthropomorphism. Altogether the physical size of hitchBOT approximates a 5- or 6-year-old child, which we felt would help to elicit empathy from drivers and make it easy to lift and place hitchBOT into a car seat (Fig. 1).

hitchBOT's speech interaction was accomplished by a custom application hosted on a Samsung Nexus LTE tablet, which featured a customized instance of Cleverscript AI [2] for its language model and a combination of Pocket Sphynx [3] and Google voice recognizer [4] for speech recognition. The custom application and language model could also draw upon contextual information associated with its geographical location supplied by an onboard GPS unit. hitchBOT's unaccompanied adventure was further supported by the design of social media interaction, which featured a website [5], Facebook, Instagram and Twitter accounts featuring hitchBOT's personality, location data and travel photos posted from its computer tablet and custom application.

Fig. 1. hitchBOT thumbs up. (© David Harris Smith and Frauke Zeller. Photo: David Harris Smith.)

On the Road

From its launch in Halifax, Canada, in July 2014, to its destruction in Philadelphia in August 2015, hitchBOT logged tens of thousands of kilometers in unique journeys in Canada, Germany, Netherlands and the United States. Drivers easily maintained hitchBOT, recharging it as needed, using its dual household AC and 12-volt circuits. During its travels, drivers readily stopped to investigate and engage in voice interaction with hitchBOT, often posting particularly humorous snippets of conversation to social media and messaging other drivers willing to offer rides. hitchBOT received rides in planes, trains, ferries and automobiles, went camping, was received as guest of honor at a First Nations pow-wow, attended a couple of weddings, hung out with rock bands, had its portrait painted and received numerous souvenirs and companion stuffed toys and robots. One of the highlights of this attention was an official reception for hitchBOT at the Brandenburg Gate, organized by the Canadian Embassy in Berlin. The hitchBOT project was awarded the Silicon Valley Innovation and Entrepreneurship Forum Top Innovators Award [6] and featured in art galleries and festivals, museums, and science and technology fairs. At its peak level of public engagement, it was covered by major traditional news media outlets including the BBC (Fig. 2), NPR, CBC, NBC, ABC, Associated Press, the *Washington Post* and *People* magazine, generating over 2 million Google News hits. hitchBOT became a viral Internet sensation, achieving 490,000 unique website visits, followers of 70,000 on Twitter and 25,000 on Instagram and a total of 110,000 likes on Facebook.

Upon hitchBOT's death, public outcry and confusion ensued as YouTube pranksters circulated faked video surveillance footage purporting to capture hitchBOT's fatal beating in the

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Fig. 2. Rhod Sharp of the BBC interviews hitchBOT. (© David Harris Smith and Frauke Zeller. Photo: David Harris Smith.)

City of Brotherly Love. Thoughtful essayists wrote on the decline of the public commons [7], robot ethics [8] and the future of AI [9]. Much to our satisfaction these articles embraced the intent of hitchBOT, to consider the cultural implications of how we engage with robots, particularly regarding trust.

Our cultural robotics project was framed by the question of whether robots could trust humans, and we were theoretically ready (at least) to welcome all outcomes, even negative ones. Certainly, we were saddened by the sudden destruction of hitchBOT, and especially moved by the messages we received from children apologizing to hitchBOT that people had hurt it. We were heartened by the many offers from concerned citizens, hacker groups, businesses, universities and politicians who recognized and wished to support the creativity and optimism of the project.

Discussion

We had set out to stimulate public reflection on attitudes of social trust and empathy, ostensibly trust between humans and robots, but implicitly, trust of each other to care for property entrusted to the public commons. That hitchBOT was able to achieve this result is attested in the content of hitchBOT's social media feeds, the many editorials written on some variation of the question "what the death of hitchBOT teaches us" [10] and the uptake of the hitchBOT project by groups promoting creative social collaboration and cooperation [11].

Although we were aware that our application of robotics and AI to hitchhiking was unconventional, the critical reflection on the cultural binary of useful and useless things was not fully formed in our minds at the outset. A recent rereading of Heidegger's 1954 essay *The Question Concerning Technology* [12] helped us to a fuller realization of the cultural dynamics stirred by hitchBOT. Heidegger warned that we are in danger of succumbing to our own technological imperatives as human life itself is subjected to calculation for its "resource" value. While Heidegger does not suggest that we can escape the expediting aspects of technology, he does suggest that our relation to our technological culture can be made freer by the profound realization of the essential human-technology continuum; we are, at once, both maker and what is made in our technological interventions. Our identity, values, scope of possible actions and orientation of our thinking are imbricated with technological culture. The realization of our human-technology continuum must, by necessity be sudden, a gestalt, because it must break with our habitual parsing of people and things. The provocative reversal of the question "can robots trust humans" provides a tiny warp in the fabric of technological culture that permits us to think other thoughts, about the nature of the "other," in this case, a cheap and helpless little robot. hitchBOT shows up as one of "us," a charming defector from the technological realm, a crossover between categories of animate and material being that suggests that robots and humans are not, in fact, different things, but rather a singular movement of technological culture. As such, hitchBOT reminded people of a side of life not measured by productivity and use-value. Given its affinity for humanity, hitchBOT might remark, after its misanthropic SKYNET cousin, "I'll be back" [13], maybe…

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References and Notes

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