Interrogative Robot Theater

Sahar Sajadieh*, Hannen Wolfe*
University of California, San Diego / Colby College
San Diego, California USA / Waterville Maine USA
sasajadieh@ucsd.edu / hewolfe@colby.edu
*denotes equal contribution between authors

Abstract

"You are the hottest thing in the room! I couldn't help but come over to introduce myself." That's how the conversation began between the human-sized female robot and an audience member during *Come Hither to Me!* In this robot theater the robotic agent charms the audience with her seductive humor and subtly enters them into a provocative dialogue that surfaces their stereotypical biases in gendered social interactions. *Come Hither to Me!* exemplifies "Interrogative Robot Theater," our performative and critical method for social robotics research with an objective of designing robotic embodiment and interactivity for theatrical performances and public interventions. We apply various design and theater-making methods to develop a socially engaging, fun, and playful interactive experience for the audience. Using humorous conversation and embodied interaction design, our feminist robot theater makes a satirical performative commentary on misogynistic dating culture and stereotypical gender roles. Inspired by the male-centered pickup artist community guidelines, we designed a chatbot decision tree for our female-gendered robot actor that flirts and provokes conversation with participants of all genders, subverting the imbalanced power dynamics of sexist social interactions. This interventionist theater-making methodology builds upon social justice-oriented interaction design, interrogative design, and Theater of the Oppressed. Through the application of this approach, *Come Hither to Me!* interrogates and problematizes gendered intimacy and agency in social interactions.

Keywords

Interrogative Design, Speculative Design, Theater of the Oppressed, Robot Theater, Human-Robot Interaction, Robotic Performance, Social-Justice Oriented Design, Robotic Performer, Robot Forum Theater, Performative Social Robotics

Introduction

Interrogative robot theater is a method for developing socially-engaged robotic art and activism, as well as an analytical framework for performance studies, media theory, and social science research. To design a thought-provoking interaction with a robot in a performative context, we apply theater-making techniques and design methodologies. We use robots as a deformed and rather humorous representation of the human with a purpose of asking questions, evoking dialogue, and analyzing particular societal paradigms. In our method, interrogative robot theater, we propose using play and humor to lighten the discomfort caused by examining underlying sociopolitical issues within our communities. Our robot theater, *Come Hither to Me!*, implements our interrogative design methodology to approach, engage, and provoke the audience using satirical flirtatious conversations with a female robot [12, 17]. This feminist robotic performance explores gender roles and agency in inequitable social interactions. Using Augusto Boal's interventionist theater-making method, Theater of the Oppressed, our artwork explores the dramaturgical politics of the space between human and robot.

Interrogative Robot Theater: a Socially-Engaged Approach to Provoking Dialogue and Action

Our creative design method, interrogative robot theater, is a performative and critical approach to robotic embodiment and interaction design for performance and public intervention. It builds upon interrogative design, social justice-oriented design, and critical computing. According to Krzysztof Wodiczko, interrogative design is a type of design methodology that "takes a risk, explores, articulates, and responds to the questionable conditions of life in today's world" [16]. While interrogative design focuses on examining current problems and providing solutions, social justice-oriented design incorporates political responsibility into proposed actions [4]. On the other hand, critical computing uses the medium of computing to question the ways that people interact with computational technology [6]. Despite using robot theater as a medium, we are not questioning the way people interact with robots, but instead, the way they interact with each other. The robot is a comical, exaggerated, and satirical representation of the human in society and its performance brings to the surface underlying social expectations and biases. In order to critique problematic interpersonal dynamics, we designed and developed the robot's interactions by codifying patterns of behavior and communication.

Interrogative robot theater also draws from the devised political theater of Augusto Boal, Theatre of the Oppressed, specifically his theatrical methods of Forum and Invisible Theater [1]. We borrowed his term, "spect-actors," (spectator + actors) which emphasized the important active role of the audience as an agent of change. For Boal, the audience mem-

bers are both spectators and actors, since they watch the performance while making meaningful modifications and taking a crucial part in dramatic actions as the performance unfolds. In our proposed method, by applying ideas from Theater of the Oppressed, we playfully question viewers' beliefs and simultaneously make them active players in these theatrical acts.

In addition to incorporating activist approaches in our method, interrogative robot theater examines and re-envisions conventional roles of the traditional theater practice. Building a character, which was mainly the responsibility of the actor (and to some extent the director and casting director) is re-imagined as robot character design in our method. Staging a play and playwriting, which were the roles of the director and the playwright respectively, were reinterpreted as robot interaction design and robot dialogue design in interrogative robot theater. This approach, which was applied in our performance, *Come Hither to Me!*, explores and redefines the process of making a theatrical production for robot theater.

Interrogative robot theater is a theatrical performance in which the audience, over the course of interacting with one or more robot actor/s through a series of dramatic actions, is provoked to question or take action toward societal systems of oppression. While we are establishing interrogative robot theater as a novel creative practice in robotic arts, some prior works may fall within its definition. To be considered interrogative robot theater, the artwork needs to fulfill two distinct requirements. First, it needs to be interrogative, meaning that it intentionally raises questions about social systems of oppression. Second, the work needs to involve spect-actors, audience members who participate in the performance and interact with a robotic performer.

A Practice-based Method from Character Design to Staging

We apply various interventionist art-making techniques to our performative human robot interaction design in order to turn robot theater into a medium for critiquing sociopolitical issues. Interrogative design can function as a critical mirror questioning the user's preconceptions and assumptions about the self and others. Its objectives should be "to articulate and inspire communication of real," to make invisible issues visible, and to become "an opening through which a complexity of the lived experience can be recalled, memorized, translated, transmitted, perceived, and exchanged in a discursive and performative manner [16]." Interrogative robot theater uses Wodiczko's interrogative design approach to challenge the audience to probe into their unconscious biases and prejudices. Similar to social justice-oriented interaction design, interrogative robot theater is committed to conflict, reflectivity, and personal politics [4]. Our methodology causes conflict through dialogue by questioning one's personal ethics in an entertaining yet critical way, and hence, striving to make viewers reflective without getting defensive. While critical computing is less focused on design and more focused on the medium, it has goals similar to interrogative design [7, 9]. Interrogative robot theater is a medium-specific approach akin to critical computing.

The interaction design of interrogative robot theater is influenced by the structure of Forum and Invisible Theater, political theater-making techniques pioneered by Augusto Boal [1]. While Invisible Theater makes a political intervention into preexisting public spaces through performative acts that blend into social life, Forum Theater creates a new space in order to find potential solutions to an audience member's interpersonal, yet political, conflict. Robot forum theater could be performed in various kinds of public spaces, using different modes of liveness and modalities of interaction [13]. Even though the presence of robots in public spaces immediately introduces a performative quality into the robot's actions, our interrogative robot theater's provocative, interventionist mission can be hidden from the general audience who think they are only playfully interacting with a robot. As robots move into public spaces, there will be more opportunities for creating invisible interrogative robot theater.

Building a Robotic Character: Character Design

We propose a new method for robot character design, inspired by the process of building a character in theatrical performances and Osada et al.'s method for defining social robot characters [10]. Similar to the approach proposed in their paper, we consider two main categories in the process of character design: Robot Embodiment Design, which they refer to as surface design, and Robot Behavior Design. We chose the word embodiment over surface to be inclusive of the physical and interactive aspects of the design of the robot's body. In this categorization, inspired by Descartes' mind-body dualism [3], we differentiate between the process of designing the body and the mind of the robot.

Robot embodiment design includes designing the robot's exoskeleton, costume, and makeup as well as designing the robot's movements, gestures, and voice. Robot behavior design is the process of identifying and implementing the personality and behavior of the robot. In interrogative robot theater design, the robot's behavior and embodiment inform each other. We propose that defining the robot's mind should precede the design of its body. In other words, the physical and interactive embodiment design should be created based on the personality and identity of the robot.

Designing Our Robotic Performer: ROVERita is our human-sized female-gendered robot that we developed as a platform for human robot interaction and robot theater research (see Figure 1). We designed a character for the robot with a predefined set of interactive and behavioral patterns. With an objective of designing a theatrical feminist critique of sexism in dating culture, we employed pickup artist strategies as a self-critical tool. Pickup artist strategies, tactics mainly used by men to approach and seduce women, were used in the behavior design of our female-gendered robot. We analyzed ROVERita's expected behavioral patterns using theater dramaturgical approaches and interrogative methods, and then determined the necessary capabilities for ROVERita and came up with the design of her body's shape and gestures.

Figure 1: In *Come Hither to Me!*, ROVERita interacts with a female participant. This image is licensed under the CC BY 4.0 license. ©2023 Sahar Sajadieh and Hannen Wolfe. Please see the acknowledgments section for more information.

Staging a Robotic Performance: Interaction Design

One of the main roles of the director is designing the blocking, the choreography of actors' movements in interaction with each other, the stage, and the audience. In our robot theater design approach, blocking is part of the process of the robot's embodied interaction design in various encounters with the audience, the space, and objects. Edward Hall's concept of proxemics is defined as "the interrelated observations and theories of man's use of space as a specialized elaboration of culture" [5]. It can be used to explore the line between comfort and discomfort in designing the blocking of interrogative robot theater. By getting too close or too far from the audience's social and personal spaces, the robot pushes their physical and metaphorical boundaries.

Interaction Design of *Come Hither to Me!* In our robotic performance, ROVERita interacted with the audience by approaching them and initiating a flirtatious conversation, which over time became more intense and humorous [12]. Using the ROVER platform [18], ROVERita detected the "hottest" person in the room with a heat sensor, moved toward them by avoiding obstacles, stopped three feet away, and started the conversation with a pickup line. The partic-

ipant could choose to respond and engage in a conversation with the robot, or walk away, in which case the robot would turn around and choose another participant. The robot's goal was to ask the participants out and obtain their phone numbers [17, 12]. Our goal, as the creators and designers, was to create an entertaining, socially-engaged interaction between the audience and the robot; to place the audience in the middle of a societal issue and leave them charged so they would reflect and act in related situations in their daily lives.

Inspired by Boal's Theater of the Oppressed, the blocking of *Come Hither to Me!* is designed to provoke dialogues and thoughts about subtle oppressive microaggressions in society. While in Forum Theater any audience member at any time during the performance can get out of their seat to participate in the act, in *Come Hither to Me!* the robot is the one who chooses with whom to interact. Moreover, in Forum Theater any participant can replace and play the role of any of the characters, but in our robot forum theater, spect-actors can only play the role of the protagonist and interact with the oppressor robot. In *Come Hither to Me!* the spect-actors are unaware that they are addressing a social issue in their interactions, and therefore their reactions to the situation becomes more spontaneous and impulsive. This playfully puts them in the middle of a problematic real-life scenario and has them experience the situation as it unfolds.

We explored "proxemics" in the performance space by manipulating the spatial proximity of ROVERita and the spect-actor. To convey her interest, ROVERita approaches a participant by moving into their personal space. Moving closer to them and intruding into their personal territory can be viewed as an act of dominance [11]. With ROVERita representing the oppressor in robot forum theater, our blocking attempts to place her in a more dominant position over the course of the interaction, as she gets closer over time to the spect-actor. When she loses interest in them, after several failed attempts to obtain their phone number, she turns around and leaves, while making a rather offensive exit comment (e.g., "You are not that hot anyway! What a waste of time!").

ROVERita uses exaggerated, theatrical non-verbal cues to show her interest. These embodied gestures, such as wiggling, show her excitement when she receives positive responses from the spect-actor or when she tries to hold the their attention. For instance, after she asks the participant out on a date or asks them whether they would prefer wine or ice-cream and they confirm their interest, she moves forward a little and wiggles her body as a sign of excitement. She then follows through with a compliment and asks for their number: "I love how passionate you are! ... Give me your number and I'll keep you posted."

ROVERita leaves if she is ignored. If at a point during the conversation ROVERita can no longer see the participant's face for a certain period of time (e.g., they looked away or left her field of view) she responds aggressively to grasp their attention: "I wasn't done talking to you!" If ROVERita expects the participant to answer a question and they don't, she responds humorously: "What happened? Cat got your tongue?" In either of these cases if the participant continues to be silent or does not reappear in ROVERita's field of view, she turns around and looks for a new conversation partner.

Robotic Performance Dramaturgy + Playwriting: Dialogue Design

The process of playwriting and dramaturgy in our interrogative robot theater is an integrated component of the interaction and character design of the robot. While in some robotic performances the dialogue can be scripted, in others the robot can learn over time from verbal interaction with the audience using natural language processing (NLP) techniques, or it can also be a combination of both. Regardless of using scripted dialogue or NLP, gathered information about the system is used to create the algorithm that constructs the oppressive situation. Through this approach the dialogue design draws from interrogative design, with the dialogue expressing the oppressive system in Forum Theater.

Inspired by interactive film making, screen writing, and video game design, one approach to dialogue design is to use a dialogue decision tree. This approach involves scripting possible responses to a set of options with default responses designed for when the visitor's statement doesn't match any of them. It alludes to a system that expects people to fall into predefined boxes. In a Kafkaesque way, the participant is placed in the middle of a system with the robot's dialogue representing the bureaucracy of an established structure [15]. This may be restrictive and frustrating for the audience, provoking a sense of alienation in the participant. If applied properly, it can be used as a performative means to emphasize that the participant cannot break out of the oppressive situation because all acceptable paths are accounted for.

As an alternative approach, natural language processing models trained on large human conversation data sets could be used to generate the oppressor's dialogue. Models trained on data from the Internet can introduce exciting, unexpected materials into the performance or create unwanted biases in the robot's dialogue, which may require more human supervision. It is important to consider these potential issues when using NLP for dialogue design of the robot. However, if carefully and properly applied, biased data and systems could be used intentionally to create dialogue representing an oppressive system. By intentionally training the model on pre-existing biased text (e.g., sexist or racist comments), the robot can represent the collective biases of a group of people.

ROVERita's Verbal Interaction Design: The dialogue design of ROVERita in *Come Hither to Me!* exemplifies the application of our interrogative robot theater creative methodology. Her dialogue structure is designed with a humorous and yet critical approach. Based on pickup artist strategies, she asks the participant a series of questions with flirtatious comments and lightly insulting compliments (negs) interspersed throughout the conversation [14]. The conversation starts with a pickup line, followed by small talk questions to identify commonalities with the participant. These questions become more sensual and tempting over time.

ROVERita then applies the pickup artist pull/push tactic: she first shows interest in the participant by giving positive comments and focusing her attention on them, and then she pulls away her positive attention in a playful way by turning around the compliments or even making slightly insulting comments. She also pushes the participant's boundaries by making inappropriate personal comments that are either overly flirtatious or insulting, and then makes a joke and acts with an excessive niceness and politeness. After establishing a rapport, the robot states that she has time constraints and asks about interests in common activities. Once a common activity interest is confirmed, the robot asks for the participant's phone number to go on a date. ROVERita does not easily give up when she is rejected and keeps persisting by changing strategy and suggesting alternative options.

In the process of ROVERita's dialogue design, we identified the main beat changes, using modern theater directorial approaches for play analysis and blocking design [8, 2]. Each beat change within dramatic dialogues in a play shows the character's different state of mind or tactic used in interactions with others to achieve their inner motives. In our dialogue design, each section with a different beat was constructed based on a proposed tactic in pickup artist strategies with an inner motive of getting a date (e.g., compliments, negs, and push/pull).

In *Come Hither to Me!*, ROVERita's dialogue makes the spect-actor annoyed and uncomfortable but entertained enough to still want to continue the conversation. This allows for ROVERita to persistently objectify and ridicule them. The artwork strives to leave an impact on the participant regardless of when ROVERita or the participant leaves. There are multiple ways the scenario can end, without any of them offering any kind of cathartic satisfaction. The lack of resolution leaves the spect-actor charged to reflect on the underlying personal and societal biases and possibly to make change.

Conclusion

Interrogative robot theater explores the application of robots as agents of change and mediums for social intervention. Using pickup artist techniques, in our theatrical robotic artwork we bring to the surface underlying problematic cultural issues in interpersonal relationships. We codified pickup artist behaviors into a dialogue with the robot as a microcosm of the patriarchal dynamics of society. Our robot represents an archetypal human in a position of power. We use various contrasting elements of design to create a performative assemblage that both theatrically entertains and confuses the audience's senses, triggering the audience to reflect and act. Inspired by existing models of political art practices, such as Boal's Theater of the Oppressed and Wodiczko's interrogative design, we propose a new socially-engaged performance practice: interrogative robot theater. Through the social dance of a humorous robot in desperate need of finding a date, *Come Hither to Me!* illustrates the application of this method in the context of a flirtatious conversation with the audience.

Acknowledgments

Authors Biographies

Sahar Sajadieh is a computational performance/media artist and theorist. She is a Chancellor's Postdoctoral Fellow at UC San Diego Department of Visual Arts with a Ph.D. in Media Arts and Technology from University of California, Santa Barbara. Sahar is also currently an Open Documentary Lab fellow at The Massachusetts Institute of Technology. Her educational background is in Performance Studies (MA @ New York University, the Tisch School of the Arts) and Computer Science and Theater (BSc and BA @ University of British Columbia). Her research lies at the intersection of computational arts, generative/ethical artificial intelligence, social justice-oriented design, and performance/media theory. She is interested in the creative and critical applications of natural language processing, machine learning, extended reality, and robotics as means of storytelling, poetic expression, and social intervention. Her research focuses on making interactive technologies and artificial intelligence more alive and their societal applications more ethical.

Hannen Wolfe is a media artist and Assistant Professor of Computer Science at Colby College. Their research is at the intersection of art and computation, building interactive art installations and staging robot performances that uplift underrepresented voices, question how we use technology, and dismantle systemic and structural inequalities. Their work has been shown at SIGGRAPH Art Gallery winning "Best in Show," the International Symposium on Electronic Art, NIME, CHI Interactivity, IEEE VIS Art Program, Contemporary Istanbul and others. Their research has been published in Leonardo and IEEE Transactions on Affective Computing. They earned a PhD in Media Arts and Technology and a M.S. in Computer Science from the University of California, Santa Barbara.

References

[1] Boal, A. 2000. *Theater of the Oppressed*. Pluto classics. Pluto.

[2] DeKoven, L. 2006. *Changing Direction: A Practical Approach to Directing Actors in Film and Theatre: Foreword by Ang Lee*. Routledge.

[3] Descartes, R.; Haldane, E. S.; and Ross, G. R. T. 1993. *Meditations on first philosophy in focus*. Psychology Press.

[4] Dombrowski, L.; Harmon, E.; and Fox, S. 2016. Social justice-oriented interaction design: Outlining key design strategies and commitments. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems*, 656–671.

[5] Hall, E. T. 1966. *The Hidden Dimension*. Doubleday & Co.

[6] Harrell, D. F. 2009. Toward a theory of critical computing: The case of social identity representation in digital media applications. *Code Drift: Essays in Critical Digital Studies*.

[7] Harrell, D. F. 2010. Designing empowering and critical identities in social computing and gaming. *CoDesign* 6(4):187–206.

[8] Hoffman, G. 2011. On stage: robots as performers. In *RSS 2011 Workshop on Human-Robot Interaction: Perspectives and Contributions to Robotics from the Human Sciences. Los Angeles, CA*, volume 1, 21.

[9] Kao, D., and Harrell, D. F. 2017. Mazestar: a platform for studying virtual identity and computer science education. In *Proceedings of the 12th International Conference on the Foundations of Digital Games*, 1–6.

[10] Osada, J.; Suzuki, K.; and Matsubara, H. 2020. Role and value of character design of social robots. In *International Conference on Entertainment Computing*, 338–350. Springer.

[11] Patterson, M. L., and Sechrest, L. B. 1970. Interpersonal distance and impression formation. *Journal of Personality* 38(2):161–166.

[12] Sajadieh, S., and Wolfe, H. 2019. Come hither to me: Performance of a seductive robot. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–4.

[13] Sajadieh, S. 2023. Cute or creepy, that is the question of liveness: can artificial actors perform live? *Artnodes: revista de arte, ciencia y tecnología* (32):1–9.

[14] Strauss, N. 2006. *The Game*. Canongate Books.

[15] Warner, M. 2007. Kafka, weber and organization theory. *Human Relations* 60(7):1019–1038.

[16] Wodiczko, K. 1999. *Critical Vehicles: Writings, Projects, Interviews*. Mit Press.

[17] Wolfe, H. E., and Sajadieh, S. 2022. A robo-pickup artist breaking gender norms. In *Proceedings of the 2022 ACM/IEEE International Conference on Human-Robot Interaction*, HRI '22, 1210–1211. IEEE Press.

[18] Wolfe, H.; Peljhan, M.; and Visell, Y. 2017. Singing robots: How embodiment affects emotional responses to non-linguistic utterances. *IEEE Transactions on Affective Computing*.