



# Telerobotic Theater of the Oppressed in Israel and Palestine: Becoming Digital Jokers

AVNER PELED, Department of Art and Media, Aalto University, Finland

TEEMU LEINONEN, Department of Art and Media, Aalto University, Finland

BÉATRICE S. HASLER, Department of Information Systems, University of Liechtenstein, Liechtenstein

The theatrical and political expression methods of “Theater of the Oppressed” by Augusto Boal were adopted by HCI researchers to facilitate participatory design. However, the potential of technology to expand and enrich these methods, particularly in intergroup settings, is still underexplored. We introduce a novel combination of participatory design, technological education, and theater: a telerobotic theater of the oppressed. We invited activists from Israel and Palestine to learn telerobotic technology and create puppet shows to run simultaneously on both sides of the border. During a weekend workshop, we created and tested the performance in two rooms, simulating Israel and Palestine. We collected, coded, and analyzed qualitative data consisting of semi-structured interviews, videos, photos, and notes. The findings demonstrate how the solution promotes intergroup contact, directly through creative collaboration and indirectly through remote performances. The analysis serves as a guide for adapting Boal’s facilitation method, the joker system, to digital technology.

CCS Concepts: • **Applied computing** → **Performing arts**; • **Computer systems organization** → **Robotic control**; • **Human-centered computing** → **Participatory design**.

Additional Key Words and Phrases: telerobotics, puppetry, performance activism, intergroup contact, theater of the oppressed, joker system, participatory design

## 1 INTRODUCTION

The call for the HCI community to take a more active role in promoting peace, social justice, and equality has increased in volume and urgency [10, 12, 39, 62, 78, 105]. In practices commonly referred to as Participatory Action Research (PAR) [60, 110, 126] and Participatory Design (PD) [20, 21, 40, 41], researchers collaborate with activist or marginalized communities and co-design technologies with a common purpose of social change. One method used in participatory design is Augusto Boal’s “Theater of the Oppressed” (TO) [23, 84]. TO is made up of multiple participatory tools and practices that use theater to address social and political issues. In this study, we introduce a novel approach to integrate communication technology with TO in the context of intergroup conflict. When intergroup contact is scarce, opposing groups are more likely to form negative prejudices against one another [6]. Therefore, we invited group members to co-create and co-perform in a telerobotic puppet theater, designed to be shown to two audiences in both groups simultaneously, bridging physical barriers. To our knowledge, such a combination of TO, intergroup contact, and participatory design of communication technology has not been studied. The suggested format has two distinct phases. In the first phase, participants meet physically

---

Authors’ addresses: Avner Peled, avner.peled@aalto.fi, Department of Art and Media, Aalto University, Espoo, Finland; Teemu Leinonen, Department of Art and Media, Aalto University, Espoo, Finland, teemu.leinonen@aalto.fi; Béatrice S. Hasler, Department of Information Systems, University of Liechtenstein, Vaduz, Liechtenstein, beatrice.hasler@uni.li.

---

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, or post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org).

© 2025 Copyright held by the owner/author(s).

ACM 1557-7325/2025/2-ART

<https://doi.org/10.1145/3717064>

to co-create the telerobotic theater. In the next phase, the plays are performed in the localities of both groups in front of live audiences. The workshop presented here implements the first phase with the objective of gaining insight for the complete process.

Our study asks two questions about the addition of the two elements: puppet making and telerobotic technology to TO in the context of intergroup contact. First, does the production process promote collaboration and dialogue between groups in conflict? Second, can the expansion of TO to a telerobotic puppet theater create meaningful digital contact between the groups? And crucially, we ask what we can do as facilitators to promote these two goals. In TO, the role of the facilitator is also named the “joker”. The joker freely moves between the various elements of the theater, mediates between the stage and the audience, and facilitates the pedagogical and critical aspects of the performance [38, 119]. By adding technological mediation to the role of the joker, we wish to become “digital jokers”. Firstly, by facilitating the democratization of technology with participatory and playful educational tools, and secondly, by enabling and orchestrating real border crossing through telerobotic live performances. The unsolicited digital inclusion of outgroup participants in a local theater play corresponds to the “trickster” element of the joker [121]. As Schutzman notes: “Tricksters reconstitute power on behalf of those without power by moving the boundaries between the haves and have-nots” [120, p. 140].

The workshop was carried out in collaboration with the Tech2Peace organization<sup>1</sup> in the context of the Israeli-Palestinian conflict. This violent and protracted conflict, currently at the state of an ongoing war [31], is fueled by its segregated nature, with severe mobility restrictions imposed between the groups. Tech2Peace is an organization that facilitates peacebuilding through technology and entrepreneurial education, fostering a community of activists who share a passion for conflict resolution and technology. We developed a kit that allows participants to create remotely controlled glove puppets (telepuppets) and incorporate them in a symmetric theater that extends over geographical boundaries. We invited Israeli Jews<sup>2</sup> and Palestinian alumni of Tech2Peace (in equal numbers) to Tel Aviv to learn technology and design a puppet theater that addresses the Israeli-Palestinian conflict from their perspective (see figure 1). In the weekend workshop, we tested the design of the cross-border performance by performing in two separate theater rooms with participants and mentors as audiences.

During the workshop, the participants produced three (duplicated) puppet theater plays in three teams. We analyzed qualitative data consisting of semi-structured interviews, videos, photos, and the scripts of the plays. The findings show the potential of telerobotic puppetry to expand and enrich TO, both by including technological education and puppet design as part of the process and by creating indirect intergroup contact through telerobotics. Since the participants were Tech2Peace alumni, already experienced with intergroup conflict resolution activities (see the Research Design section for more information on the participants), the study does not draw conclusions on the potential of the method to facilitate intergroup contact within general populations. Because this was an initial time-limited exploration, we do not define the finalized workflow of a telerobotic TO workshop and its resulting live performances. Instead, we used the impressions and ideas of the participants to answer the research questions and instruct further development of the format and the facilitation methods of the digital joker. In the following sections, we present a theoretical review, the findings, including a description of the plays created by the participants, and the analysis of the collected data. We follow with a discussion of our findings and how they guide us further.

<sup>1</sup><https://www.tech2peace.com/>

<sup>2</sup>The two groups in the conflict are commonly referred to as “Palestinians” and “Israeli Jews” [87]. The term “Israeli Jews” is used to exclude Palestinians who have Israeli citizenship. Palestinians who remained within Israel’s borders in 1948 (after Israel’s war for independence and the Palestinian “Nakba” [107]) were granted citizenship in Israel.



Fig. 1. A story of reconciliation through falafel - one of the plays produced by the participants.

## 2 BACKGROUND AND RELATED WORK

### 2.1 The Israeli-Palestinian conflict

The intractable [14] Israeli-Palestinian conflict is defined as protracted [13], as well as asymmetric [87], with the Palestinians being the disadvantaged group and the Israeli Jews the advantaged group [87]. It exhibits an oscillating level of violence since the founding of Israel in 1948, which Palestinians refer to as the “catastrophe” or “Nakba” due to the mass displacement of Palestinians from the region [107]. Since then, the conflict periodically reaches a state of heightened armed interventions that are often defined as wars. It is characterized by a lack of communication and high levels of prejudice and dehumanization [87], which demand creative thinking to bridge the two groups [15]. Although some Palestinians were granted Israeli citizenship in 1948 and some were granted residency after the annexation of East Jerusalem in 1967, the two peoples are largely separated [145]. The focal points of the violent conflict are on the borders of Israel, the West Bank and Gaza, where Israeli separation barriers, military checkpoints, and fences control movement [4]. Due to the difference in power in the region, Palestinians in the West Bank (excluding East Jerusalem) are not allowed to cross into Israel without a special permit (usually for work), while Israeli Jews have a relative freedom of movement. However, the presence of Israeli Jews in the West Bank is only in the form of settlements<sup>3</sup> that reside in gated communities [56]. In addition, Gazan citizens have been isolated in a blockade imposed by Israel and Egypt when Hamas gained control over the region in 2007 [1]. As a result, most of the interactions between the groups are at military checkpoints [5]. Despite local and international attempts to reach a solution that ends the conflict, the belief in peace within the groups has been declining since 2016 [35]. On 7 October 2023, the conflict reached another boiling point on the Gaza border, which started a long and debilitating war in the region that resumes at the time of writing [31].

### 2.2 Telerobotics and Intergroup Contact

The “contact hypothesis” of Gordon Allport [6] states that, within the right conditions, contact between groups in conflict is crucial for the dissolution of prejudice and negative attitudes. Those conditions are generalized to the following: a) equal status between the groups, (b) common goals, (c) cooperation, and (d) institutional support.

<sup>3</sup>The Israeli settlements in West Bank are defined illegal by the International Court of Justice (ICJ), yet the Israeli supreme court has often validated their formation [74].

The initial contact theory [106] referred to physical meetings between group members (such as workplace or neighborhood meet-ups), but advances in communication technology, combined with the immense challenge of establishing contact in areas of conflict, sparked the field of indirect contact [139]. In indirect contact, group members experience contact without sharing a physical space. Under the category of digital contact [104] (also known as e-contact [140] or online contact [67]), Peled et al. established the “telerobot contact hypothesis” [102], seen as a midway between direct, face-to-face contact, and virtual contact. The authors provided a set of design hypotheses and guidelines for the use of telerobotics as a medium for intergroup communication. Telerobots [57], as envisioned by Marvin Minsky and Patrick Gunkel [92], are robots that mediate the presence of human operators in a remote location. Telerobots are used when physically attending a location is desirable but challenging: a search and rescue operation in a hazardous environment [132], or providing care in the time of a pandemic [66]. The human operator’s experience in this scenario is referred to as telepresence [122, 123]: feeling present in a remote environment, and as a sense of embodiment [44]: feeling in control of a remote body. This is accompanied by a sense of co-presence for those who interact with a robot [7], feeling that the robot operator is in fact present with them on site.

According to Peled et al. [102], based on previous research, a high degree of presence in telerobotic contact would promote a positive outcome, reduce prejudice, and improve attitudes between groups. Additionally, the telerobotic system should be symmetric so that participants feel they are on equal grounds [86]. When only one participant in the conversation uses (and hides behind) a robot, it may induce a sense of power, distorting the relations between the sides. That is the dominant form of telepresence and telerobotics [96, 97, 102, 133], where at one end of the line a human operates a robot, perceiving the remote location through its eyes (cameras), and at the other end, people in the remote environment interact with the robot as if it is an embodiment of the teleoperator. Asymmetric architectures are being deployed in contexts such as education [65, 80, 82], health [29, 90, 142], and the workplace [25, 79, 127]. In our design of a telerobotic theater, the setup is symmetric, allowing the interlocutors to simultaneously interact with their partner and operate their telerobot. Previous designs achieve this using body scanning [95, 144], but the architecture presented here is simplified to the use of the hand inside a glove puppet. In such architectures, the two interlocutors have a sense of co-presence, but not telepresence (see the Research Design section for a detailed description). Additionally, the audience watching the performance is sensing co-presence with the puppet that is operated from the remote location. Indirect contact can also occur vicariously [135] when an audience witness an encounter between the groups as a bystander [108].

Finally, the “telerobot contact hypothesis” suggests that one should consider the different needs of groups in conflict when designing a telerobotic encounter [102, 124]. As a result of the asymmetric power relations, the disadvantaged group (in this case, the Palestinians) is more likely to seek direct confrontation and empowerment in dialogue, while the advantaged group (in this case, Israeli Jews) tends to seek acceptance, co-existence, and empathy. Furthermore, in the context of the Israeli-Palestinian conflict, Palestinians often oppose any form of communication that symbolizes normalization of relations with Israeli Jews before power imbalance is restored [5]. An initial survey by Peled et al. [103] showed that the distancing nature of telerobotic communication could make it a favorable form of intergroup communication for Palestinians, as it resonated less as a normalization of relations. In this study, we explore how these different attitudes manifest in the participants’ design and discussions for the telerobotic puppet theater.

### 2.3 Theater of the Oppressed and Participatory Design

The notion of a “people’s theater”, a theater for the working class that deals with contemporary political matters, can be traced back to the Agit-Prop Theater movement in Soviet Russia of the 1920s and the later work of Bertolt Brecht [28, 48]. A more direct inspiration for TO was from Boal’s fellow Brazilian, Paulo Freire. In his work: *Pedagogy of the Oppressed* [47], Freire outlined a manifesto calling for the democratization of knowledge and

knowledge production. Inspired by Freire's desire to dissolve the divide between student and educator, Boal sought to dissolve the divide between actor and spectator. Boal devised a toolbox that gradually transformed participants from objects to subjects. It starts with *Simultaneous Dramaturgy*, when the audience is invited to rewrite a part of the plot for the actors in the middle of the play, continues to *Image Theater*, where the participants physically sculpt the scene with the body of the actors, and then *Forum Theater*, where the participants take the reigns and act. TO disseminated as a political tool around the world [63], including India [91], France [45], and New York [114]. TO was also used to facilitate dialogue in the Israeli-Palestinian conflict [8], including the use of *Invisible Theater* [9], another concept of Boal in which covert performers enact a political performance at a site of conflict without revealing that the happenings are staged. As mentioned, the pivotal role in the TO process is that of the joker [23, 24, 121]. The fluid movement of the jokers and their ability to intervene in the process create spaces for facilitation and discussion. Agosto et al. analyze the role of a joker as "border crossing" [2]. It has the power to establish borders (cultural, bodily) between participants, but those borders only "serve spaces for rest and rejuvenation – until they do not...joking ultimately aims to destroy barriers that maintain oppression and retain borders only to cross them" [2, p. 712].

The TO tools were used in Participatory Design [84], User-centered Design [94], Critical Design [22], Experience Design [136], and Game Design [46]. Although not strictly aimed at political performances, these techniques support a more democratic and inclusive design process. HCI has a more direct relationship to performance activism when researchers collaborate with artists to incorporate technology into their works [18, 43, 113, 130, 131]. Often, such performances are of a political nature [3, 17, 68, 130]. PD and PAR were previously used to facilitate intergroup contact in an intercultural, [41, 143], intergenerational [37] and interfaith [112] context, but the proposed combination of participatory technological design with intergroup contact and TO is so far unexplored. At its core, PD offers a collaborative setting, beneficial for intergroup contact, and supports the empowerment of disadvantaged groups. It also increases the engagement with technology, as has been shown in the co-design of robots [52, 61, 111]. This study is a first exploration of these aspects merged into a TO setting of telerobotic puppetry.

## 2.4 Puppetry, TO and Robotics

Puppet theaters have long been a tool for political activism. Examples include Peter Schumann's "Bread and Puppet", an anti-war and civil rights theater in the 1960s and 1970s in New York [117], and Gary Friedman's "Puppets against Apartheid" in the 1980s in South Africa [75]. Studies suggest that puppets are a radical political tool because they are perceived as a separate agency from their puppeteer. Not only do they free the puppeteer from conforming to cultural and social inhibitions [118], they also endow them with a layer of protection from authorities, institutions, and the audience [75]. TO workshops are usually conducted with human actors, but there are some examples of puppets or other objects used as a theatrical tool of expression [109]. Puppets are known for their efficacy in therapy and educational settings, especially with children who are dealing with trauma [11]. The qualities of protection, distancing, and hybridity [141] in puppeteering are discussed as possible conduits for political expression via TO [51].

Robots have been used in theater, both as autonomous puppets, performing without human intervention [69, 81, 138], which is also a common scenario for STEAM (Science, Technology, Engineering, Arts and Mathematics) education [16, 71, 73], and as human-operated telepuppets, be it full body tracking [115], or hand tracking for glove puppets [64, 83] and marionettes [36, 129]. Robots were used as objects in TO workshops with children exploring bullying [55, 116, 134], but not in an intergroup or teleoperated context. Sanourbari et al. noted the similarity between robots and puppets and argued for the advantages of puppetry in TO [116].

In a 2021 survey of telerobotic contact conducted by Peled et al. among Israeli Jews and Palestinians [103], participants were asked to rate their interest in an intergroup telepuppetry performance compared to more

traditional scenarios of telerobotics and communication. The puppet theater scenario was broadly less popular, but for some participants, the idea of a puppet performance increased their motivation to communicate, despite having negative attitudes toward robots or the outgroup. In addition, a popular choice for participants was to communicate with the outgroup with two identities. One identity for the robot, and at the same time displaying their identity as the operator. This “dual identity” strategy [30] fits the puppetry medium and was shown to benefit intergroup contact while maintaining support for social change [59].

### 3 RESEARCH DESIGN

#### 3.1 Workshop Preparation

The technological concept designed for this work is as follows: We constructed two identical theater sets. In each, a puppeteer performs with a regular glove puppet, performing along with a co-located telepuppet (see figure 2). By wearing a motion capture glove on the hand that fits inside the puppet, the hand movements of the puppeteer get mirrored by a remote telepuppet. On the other end, another puppeteer performs alongside the telepuppet, thus creating a symmetric duplicated theater that could operate simultaneously in Israel and Palestine. Although the symmetric design prevents the teleoperators from perceiving the remote environment (telepresence) while they are operating their puppet, it maintains the sense of co-presence, as they are acting alongside another robotic puppet.

The Tech2Peace organization stood out as the most appropriate partner for the workshop. After a round of interviews and meetings with Tech2Peace, we received approval for the initiative and a slot for a weekend seminar with Tech2Peace alumni as participants. In its primary function, Tech2Peace offers intensive two-week gatherings that combine technology and entrepreneurial education with conflict resolution. For alumni of those gatherings, Tech2Peace offers periodic seminars, organized primarily from within the community. The activity was attractive to the NGO because the participants would learn about telerobotics and, at the same time, collaborate to create new perspectives on the conflict (via puppet performances). This workshop was our first collaboration with Tech2Peace and the first time that an alumni event was organized by members outside of the community. Therefore, it was designated as a small-scale experiment for future collaborations.

Tech2Peace maintains contact with its alumni to invite them to forthcoming events. We co-wrote an invitation form that was sent to all alumni. It described the activity, collected registration requests with informed research consent from those interested, and collected information on the previous experiences of the participants. Logistically, it is easier for Tech2Peace to have events in Israel than in the West Bank (more facilities, more mobility). They delegated location selection in Israel to us and we reached out to *Craftoola*<sup>4</sup> - a community center for making and crafting in Tel Aviv founded by artists and educators of new media. Participants who did not live in Tel Aviv shared rooms in a hostel. The language used in the workshop was English. English is commonly used as a “neutral” language in Israeli-Palestinian peace initiatives, especially those that involve educational content [72]. The workshop took place in June 2023 and was planned as follows: the first evening was for introduction, team division, and planning at the hostel, the second (full) day focused on producing the plays at Craftoola, and on the third day (also in Craftoola), teams would finalize the production and perform in front of an audience in the venue and online with guests on the Zoom platform. Initially, the organizing team consisted of the three authors of this article, a representative of Tech2Peace, and the founder of Craftoola. We turned to the community for help and were able to draft mentors for the workshop through acquaintances of the first author and the founder of Craftoola: three from the new media art community and two from the maker community. In addition, two members of the New Israel Fund Deutschland education program<sup>5</sup> joined as supporters. In total, we had 12 staff members (8 of Israeli nationality, 1 Palestinian, 1 Finnish, and 2 German) supporting 23 participants.

<sup>4</sup><https://craftoola.com/>

<sup>5</sup><https://www.nif-deutschland.de/>



Fig. 2. The symmetrical puppet theater in two rooms, as it appeared on the Zoom livestream. In each setting, one puppet is operated by a human actor and another is a telerobot. The sign in “Puppet Show 2” states the name of the restaurant in Hebrew and in “Puppet Show 1” in Arabic.

### 3.2 Participants

The workshop included 23 participants: 10 Israeli Jews (7 women and 3 men) and 13 Palestinians (9 men and 4 women). The Palestinian participants were divided as follows: six were citizens of Israel (1948 Palestinians [107]), two had residency (because they lived in East Jerusalem, part of the West Bank that was annexed in 1967 [145]), two already had a permit to enter Israel from the West Bank by work or study, and two had the access permit arranged for them by Tech2Peace. The participants were young adults, between 20 and 40 years old, and had diverse professional and academic backgrounds. The degree of previous acquaintance between the participants varied. Some participants were familiar with each other from previous Tech2Peace events and some have met for the first time. Teams were divided beforehand, ensuring equal diversity in skills, gender, and nationality. Table 1 lists the participants and their background in detail, and if there were absences. The research staff was present for the entire duration of the workshop.

### 3.3 Task Description

We decided that the participants would produce three theater plays. Each play would have two identical sets in separate rooms, simulating a parallel performance in Israel and Palestine. Every theater set would have two characters: one operated by an Israeli Jew actor and one by a Palestinian actor. Consequently, a total of six regular glove puppets and six telerobotic clones of these puppets were produced in the workshop. On the first evening of the workshop, we presented the teams, handing them a printed form where they had to fill out the chosen roles of the members (crafting, designing, technology, writing, puppeteering) as well as the general concept of the play and the characters they chose (one operated in Israel and one operated in Palestine). Since the participants did not have previous experience with theater or playwriting (as is common in TO), we introduced three broad types of play. First, a political satire, demonstrated using a video from Gary Friedman’s “Puppets against Apartheid” [75]. The second type was “Parable/Fable” - a fictional story that ends with some moral lesson about the conflict, and the third was a “Narrative” play - where the puppets re-enact a realistic narrative, highlighting the different perspectives of each group. We suggested that the plays would be 10-15 minutes, as in Boal’s “Forum Theater”. Unlike the common practice of the joker, we did not have the opportunity to intervene in the plays during their performance. Since most of the time was spent on technological production and crafts, each team could perform just once at the end of the workshop. Additionally, to speed up the work, we advised participants that they could



Table 1. The participants of the workshop

Participant	Team	Identity	Occupation	Absence
1	1	Palestinian	Computer science student	
2	1	Palestinian	Musician	Last day
3	1	Palestinian	Civil engineer	
4	1	Palestinian	Biomedical engineer	
5	1	Israeli Jew	Software developer	
6	1	Israeli Jew	Nursing student & Entrepreneur	Introduction
7	1	Israeli Jew	Teacher	
8	2	Palestinian	IT professional	
9	2	Palestinian	Entrepreneur	
10	2	Palestinian	Software developer / Peacebuilder	Last day
11	2	Palestinian	IT professional	Last day
12	2	Palestinian	Computer science student	Introduction
13	2	Israeli Jew	Multidisciplinary creator & producer	
14	2	Israeli Jew	Computer science researcher	
15	2	Israeli Jew	Robotics engineer	
16	3	Palestinian	Biotechnology & food engineer	
17	3	Palestinian	Software developer	
18	3	Palestinian	Computer science graduate	
19	3	Palestinian	Applied Physics student & Security guard	Introduction
20	3	Israeli Jew	IT Product manager	Last day
21	3	Israeli Jew	Computer science student & instructor	
22	3	Israeli Jew	Art & education student	
23	3	Israeli Jew	Dancer and Computer science student	

use ChatGPT [98] to get help writing the script. We also encouraged the participants to think about how they could involve the audience in their plays.

### 3.4 Telerobotic solution architecture

The diagram in figure 3 presents the technological solution developed for the workshop. The flow of data through the hardware and software is as follows: 1) The puppeteer is wearing a glove puppet on top of a motion



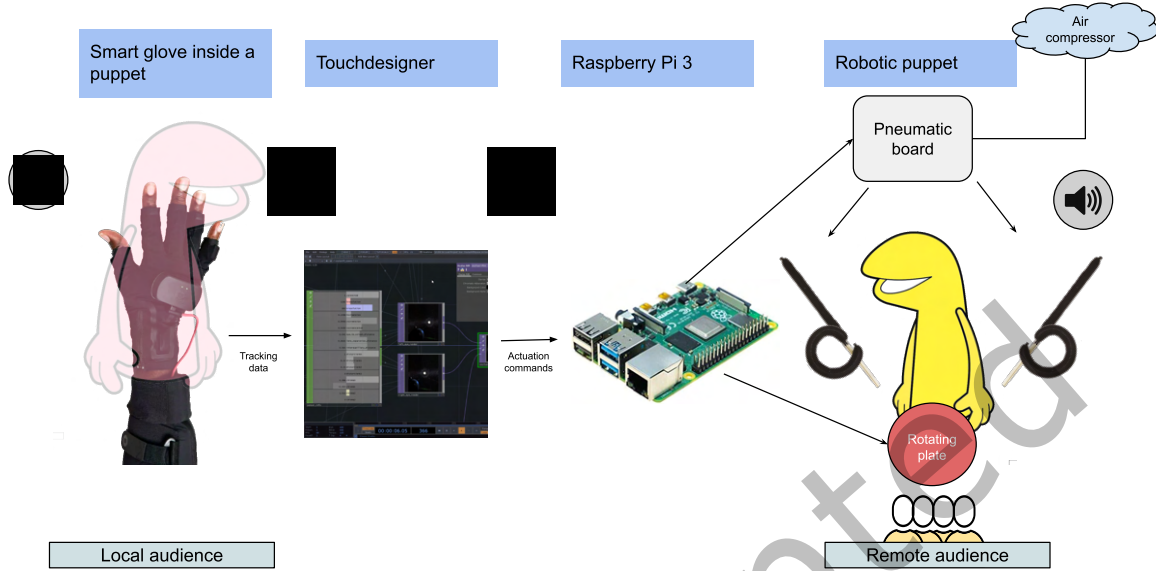


Fig. 3. The flow of data from one theater set, where a live actor is wearing the glove puppet on a smart glove, to the other end where the telepuppet mirrors the movement.

capture smart glove, 2) data regarding finger and hand position and rotation are streamed to a computer with Touchdesigner<sup>6</sup> software, 3) Participants use Touchdesigner's graphical interface to process the motion data and assign it to actuators on the robotic puppet running Raspberry Pi.

The puppet is mounted on a rotating plate that adjusts its rotation based on hand orientation. Each telepuppet contains two soft textile-based actuators that drive its bodily gestures. The actuators are connected to a pneumatic board that controls inflation and deflation in response to finger flexion and extension. The pneumatic board has inlet and outlet valves for every actuator and flow control valves to tune the actuation speed. The air pressure is delivered by a consumer-level air compressor. In addition, the voice of the performer is transmitted to the remote theater via a laptop.

### 3.5 The Telerobotic Puppetry Kit

The telerobotic puppetry kit includes the hardware and software required to produce a symmetric telerobotic theater with two telepuppets. For the telepuppets, we chose a pneumatic, textile-based, soft-robotic design based on the work of Cappello et al. [33, 34]. We found this approach applicable to glove puppets and suitable for non-professionals in robotics. Additionally, Peled et al. saw value in the sense of safety that a soft actuation could provide, as it is harder to perceive a soft robot as causing damage or harm [102].

Crafting materials, pneumatic equipment, and smart gloves were shared between the participants, while other components were available to each team in the kit box (two boxes per team). The kit also contained an engraved laser-cut panel for mounting the hardware components (see figure 4). The kit made extensive use of 3D-printed components to house the hardware and mount it on the laser-cut panel. The specific materials and equipment

<sup>6</sup><https://derivative.ca/>

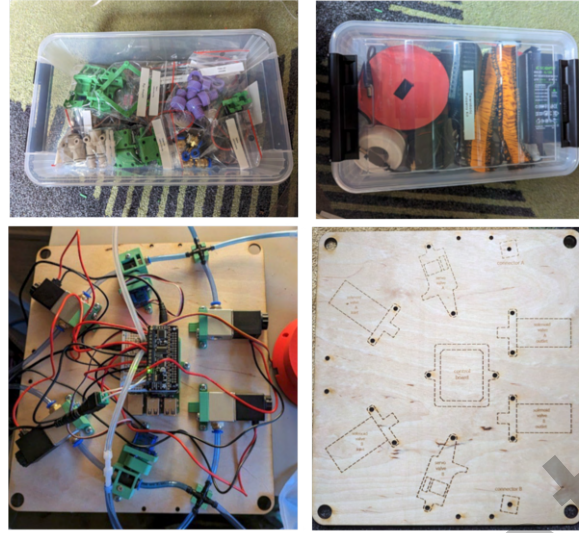


Fig. 4. The telerobotic puppetry kit. Components in the kit are mounted by the participants on the engraved laser-cut panel and routed to the telepuppet.

used are listed on the supplementary sheet. We also publish all the source files, drawings, and 3D models used in the kit.

Ready-made software was available to participants with some required modifications. The participants had to configure the TouchDesigner project to read the desired fingers from the smart gloves and send the commands to the Raspberry Pi. The code on the Raspberry Pi was programmed in Rust language and required the participants to edit the configuration file with the appropriate PINs and names of their actuators. We provided two ready-made textile actuator sleeves to each team. The participants had to cut and seal the TPE bladders (see [33]), insert them into the sleeves, and sew. We prepared a documentation website for the participants explaining the production process.

### 3.6 Data collection and Analysis

Empirical data were collected during and after the workshop. The data includes observation notes, photos and videos, three mid-work semi-structured group interviews with each team, the scripts of the three plays, and ten post-workshop semi-structured individual interviews with selected participants (see table 2). In mid-work group interviews, we asked the team about their current state and how they decided on the design. We also asked for general feedback on the concept and if they imagine showing their play to an outside audience. The discussions were free and moderated by the researchers only to ensure that all voices were heard. The semi-structured post-workshop interviews included the following topics: 1) Background and motivation of the participant, 2) Personal experience of each day of the workshop, 3) Rewatching and discussing the play that the team produced, 4) If applicable, the experience of puppeteering, 5) Speculating on reactions to the play in the participant's locality, 6) Feedback on the technology, concept, and workshop organization, and 7) Thoughts on the next phase. Individual interviews allowed us to triangulate information collected from other data sources [53] and to obtain a deeper personal perspective on the research topics. The participants in the individual interviews were sampled so that all teams and nationalities were represented and higher priority was given to the participants who performed

Table 2. Data gathered from the workshop

Data	Amount	Comments
Scripts of the plays	3	Text
Video recordings of the plays	3 (30min)	From both rooms
Video clips of the process	176 (1hr25min)	From 3 workshop days
Images from the process	210	"
Audio recordings of team interviews	3 (1hr9min)	During the workshop
Videos of individual interviews	10 (9hr7min)	After the workshop

Table 3. Thematic analysis

Theme	No. of subthemes	Code frequency	Example codes
Intergroup contact with puppets and technology	3	103	"Easier to talk through the puppet", "Use of stereotypes in design"
Digital contact with telerobotics	2	219	"Co-presence with the co-actor", "Expecting negative reactions (PS)"
The role of humor	0	47	"Comedy is not normalizing", "Favoring the use of humor"
Lessons for participatory design	0	121	"Gender dominance", "Missed working with the technology"

the plays. The videos and photos were taken by the mentors and participants when they felt appropriate, with the approval of the participants. Videos of all performances were recorded. Anonymized transcripts of the interviews will be published in The Finnish National Board on Research Integrity (TENK)<sup>7</sup>.

Data were analyzed and coded according to reflexive thematic analysis [26, 27] (for our reflections, see the "positionality" and "discussion" sections) with open-source *QualCoder* software<sup>8</sup>. The unit of analysis was defined as a statement made by the participants. The codes and themes were assigned by the first author to the transcribed interviews and documented media. The codes were then reviewed by the second author. The first coding iteration produced 236 codes from which we mapped out 13 initial themes. The majority of themes in the group discussions were also reflected in the individual interviews. While group discussions were an opportunity to hear more pluralistic points of view and see discussions happen in real-time, in individual interviews we were able to dive deeper into the dynamics from individual perspectives and reflect with the participants on the experience. In the second iteration, the themes were reviewed, refined, and merged to 4 themes and 5 subthemes that capture the essence of all data sources and connect back to our research questions. Table 3 summarizes the resulting themes.

<sup>7</sup><https://tenk.fi/>

<sup>8</sup><https://qualcoder.wordpress.com>

### 3.7 Ethics and Positionality

While the first and third authors are of Israeli nationality, the research is conducted primarily in Finland, the country of residence of the first author. The principal investigator (second author) and the funding body are Finnish and have no official position on the Israeli-Palestinian conflict. The principal investigator oversaw the research design and data analysis to mitigate possible bias. Tech2Peace is funded by international donors and employs Israeli Jew and Palestinian personnel. Furthermore, this research does not take a position on possible resolutions of the conflict. Instead, it facilitates grassroots communication between the two groups so that resolutions can emerge from within.

The research followed the research ethics protocols of The Finnish National Board on Research Integrity (TENK). The involvement of Tech2Peace as a co-organizer and the fact that all participants were experienced alumni reduced the overall risk of harm to the participants and staff. All participants have provided their informed consent to participate in the research project, and privacy and security of those who wished to remain anonymous were ensured. We have also confirmed quotes with the participants in some cases where anonymity within the teams could be compromised.

We acknowledge that supporting dialogue is in itself taking a stance toward normalization of communication. Some argue that contact may decrease motivation for social change [5]. In response to such concerns, models such as the Integrated Contact Collective Action Model [59] define conditions in which intergroup contact does not negate social action, for example, maintaining group differences, discussing inequalities, and empowering group members. These elements serve as guidelines for our work.

## 4 PRODUCED PLAYS

The teams have produced and performed three theater plays. Some of the robotic actuators showed only minimal movement in the final presentation due to changes made at the last minute, but the overall impression was of satisfaction. The plays and the process of their conceptualization are described in the following subsections.

### 4.1 Team 1: The office

Abraham, a male Hasidic Jew, and Iman, a female Muslim Palestinian, work together in an office (figure 5). When thinking about how they could convince the management board of their company to raise their salary, Iman suggests asking ChatGPT for ideas. Abraham is skeptical:

**Abraham:** If ChatGPT is sooo amazing, tell it to solve the Israeli-Palestinian conflict.

**Iman:** Good idea! [Typing] ChatGPT, please solve the Israeli-Palestinian conflict.

**[Reading]** “The solution to the century-long conflict is quite simple. Have Ismail Haniyeh and Itamar Ben Gvir<sup>9</sup> in bikinis, wrestling to death in a mud pool. The winner takes the whole land.”

**Iman + Abraham to the audience:** Kids, who want to see Ben Gvir and Hanyieh wrestling in bikinis in a mud pool?

### 4.2 Team 2: The falafel stand

In 2034, Israeli and Palestinian falafel sellers argued about who invented falafel and who makes the better falafel (Figure 1). The argument becomes heated:

**Israeli:** Enough! I will deport you back to Palestine if you keep this up.

**Palestinian:** And I will report you to the UN for harassment and cultural appropriation!

<sup>9</sup>The former head of “Hamas” (assassinated in July, 2024, reportedly by Israel) and the right-winged Israeli minister of national security.



Fig. 5. On the top: “The office”. At the bottom: “The hippo and the parrot”.

One year later, the argument repeats itself, but when the Palestinian decides to try the Israeli falafel, he finds it surprisingly delicious. The two decide to call it a truce. The final scene in 2037 shows the two cheering for friendship and falafel.

#### 4.3 Team 3: The hippo and the parrot

A hippo named “Bamba” and a parrot named “Kofi” argue over a pebble (Figure 5). The hippo found the pebble in the water, and the parrot claimed that it belonged to him, but he dropped it. An argument evolves, with the hippo claiming “finders keepers” and the parrot citing rules of possession. Eventually, they resolve the conflict when the parrot offers a fruit to the hippo that it would not have been able to pick by itself: “A new friendship was born, realizing the value of understanding and compromise”.

### 5 FINDINGS

The findings presented in this section correspond to the derived themes and subthemes. Participant identifiers in quotes are denoted by their index in the table and a group identifier: “IL” for Israeli Jew and “PS” for Palestinian.

#### 5.1 Theme 1: Intergroup contact through puppets and technology

*5.1.1 Puppets as a liberating medium*. Participants agreed it is easier for them to talk about the conflict through puppets. This sentiment was discussed in one mid-work group discussion when a mentor wanted to ask:

**Mentor:** Do you think it’s easier to voice certain things through the puppets?

**Participant 1 (PS):** For sure, yeah. I think it's more friendly and less intimidating to the audience and for me...like, I don't like to express my political views, generally speaking, so I'd rather have a puppet to do it.

And in the post-workshop interviews, such as with Participant 3 when asked for their opinion on the concept:

**Participant 3 (PS):** It makes talking about the conflict - since it's a heavy topic or a sensitive topic, it makes it "Yeah! Let's talk!". Like the puppet is saying it - it's not me.

Participant 6 had a similar notion in the post-workshop interview:

**Participant 6 (IL):** You can really have them fight, and then our brain doesn't take it as a fight between people, and it's a lot easier to accept important and difficult information.

And Participant 9 reflected in the post-workshop interview on the nature of puppets:

**Participant 9 (PS):** It's something that grabs you to your childhood. When you have puppets... you think as a child's mind - that pure clean mind.

**5.1.2 Invoking dialog through puppet theater design .** The discussion of the scenery, dialogue, and characters of the puppet play within the groups gave the participants an opportunity to approach various aspects of the Israeli-Palestinian conflict. The falafel play discussed the symbolic conflict about the origin of the falafel dish [50]. The team asked ChatGPT to create a script on the topic, and the result was a naive story of reconciliation. A team member described the design process in the post-workshop interview:

**Participant 13 (IL):** ChatGPT brought it, and then we were like "this is so rainbows and butterflies, woohoo!" we laughed about how stupid it is...So if the story is like "oh, we're cute and cuddly", then the characters could be accordingly very vulgar. Because it's obvious that this is a joke. It's obvious that neither this nor that is the reality."

The character design was intended to be stereotypical, but it prompted discussions in the group. A Palestinian participant explained in the post-workshop interview:

**Participant 12 (PS):** Why is it that always it's expected that the Arab person is a terrorist wearing a kufiya and that the Israeli person is, like, just having fun?

The participants reported that the team listened to the concerns and that the design was amended.

The hippo and parrot play revolved around water, another key aspect of the Israeli-Palestinian conflict (water resources in the region are under Israeli control [49]). The team looked for a theme of reconciliation related to water and came up with the symbiotic relationship between the hippopotamus and the Oxpecker bird that has been observed in Africa [128]. After lengthy discussions, the team settled on a script made by ChatGPT, but the question of which animal represents which nationality remained. In the group session, a Palestinian participant suggested that Israel should be the hippo, after previously describing the hippo as "the most aggressive animal on the planet". An Israeli Jew participant commented:

**Participant 21 (IL):** If the hippo was Israel and the bird was Palestine, then Israelis would be mad. Because [Participant 19 (PS)] said "the most aggressive animal" - like what the hell.

The office team used a Breslov [93] Yamaka found in the props and a Muslim Hijab to make the characters stereotypical and satirical. However, they also considered a message of gender equality when they decided to portray the Palestinian character as a modern technologist woman, while the Israeli male character was more conservative.

**5.1.3 Collaboration through crafting and technology .** In post-workshop interviews, we asked the participants about their motivation to join the workshop. The most common response was an interest in telerobotic technology.

This was followed by an interest in craft and in puppetry. One participant described the Tech2Peace rationale of combining technology and dialogue in the post-workshop interview:

**Participant 9 (PS):** I found technology really...strong tool that makes people go together. Because you think [about it], without thinking about anything else, and then you can build a base for any other discussion.

Multiple participants reported in the post-workshop interview that those who were more proficient in technology helped others working with the kit, both in their team and in other teams. Participant 6, who was more occupied with crafting, commented on its potential to build friendships in the post-workshop interview:

**Participant 6 (IL):** They put us in the place for sewing...I sat with girls in other teams and we could talk...what we were doing was not like programming, not thought intensive, so we really had time to talk. It was fun, I really enjoyed it, as a kind of grandma.

Although there were some missed expectations and collaboration issues (to be discussed in the theme “lessons for participatory design”), there was overall positive feedback from participants on the making experience and the teams were able to resolve disagreements. Participants reported getting closer to participants of the other nationality, both in group discussions and individual interviews. This was also apparent in the fact that participants stayed until late at night to finish their work with the team, and some of those who had to leave joined the Zoom broadcast to see the final play. Participant 1 described the positive experience in the post-workshop interview:

**Participant 1 (PS):** It was [really] amazing and just so much fun... The people and the camaraderie that we got to build... Working through the tasks was amazing... By the end of the weekend we just felt very close together and I love that we stayed until late.

## 5.2 Theme 2: Digital contact with telerobotics

**5.2.1 The implications of contact.** The idea of performing a puppet play involving one local actor and one teleoperated actor from another nationality spawned various discussions and ideas from the participants. In a group discussion, the possibility that the audience is afraid of the robot was raised. A comment that it would “scream Allah Wakbar and then explode” was raised jokingly by a Palestinian participant. But more seriously, multiple participants commented in the post-workshop interviews that Israelis and Palestinians who are not of a liberal background are not ready to see such an encounter. For example, as noted by Participant 3:

**Participant 3 (PS):** I think we’re not ready yet for these shows, you know, because people are still dogmatic and and not ready for that in my local place. But maybe in other places.

And Participant 13:

**Participant 13 (IL):** There could be a lot of antagonism, like what is this leftist thing, ‘why involve Arabs now?’...I can see that happening.

In the mid-work group session with the “office” team. The possibility that such a performance would be criticized in Palestine as an attempt to normalize relations with Israel (see [89]) was raised.

**Participant 2 (PS):** If it’s the same story about peace it won’t be accepted in the west bank because it will be called a normalizing and of all this you know...but in Tel Aviv, I think they accept everything.

**Interviewer:** Even if it’s puppets? it’s a puppet show.

**Participant 2 (PS):** It’s a puppet, but there’s also a story...between Jews and Arabs.

**Interviewer:** Would it affect the audience if they know that one of the puppets is actually controlled by an Israeli from Tel Aviv?

**Participant 2 (PS):** It will, like, support the idea of Israelis controlling the West Bank.



However, participants were interested in suggesting measures that would mitigate these issues. The most common suggestion being that the identities of the puppet operators would only be revealed at the end of the show, after the viewers got used to the setting and were drawn to the story. This strategy was suggested in all group sessions and also discussed in multiple post-workshop interviews, for example, by Participant 9:

**Participant 9 (PS):** I'm OK with exposing who I am and where I'm from, but if I did it, I prefer to keep it at least to the last of the show, to avoid any previous perspectives.

And, as noted by Participant 12:

**Participant 12 (PS):** This is actually the Tech2Peace technique. You know, first they introduced us as friends and then we start expressing our opinions.

**5.2.2 Co-presence in the telerobotic performance .** Performing participants reported sensing that there is another human present with them on the set. The performers were concentrating on reading the script correctly and moving their puppet and did not think about telerobotic communication. Participant 9 described their perception:

**Participant 9 (PS):** I actually didn't feel that it's a robot. I felt that it's another person that's sitting next to me and moving his own puppet, and it was all about the the script, the show itself.

And a similar notion was described by participant 23:

**Participant 23 (IL):** For me, there is another person...There is something significant in knowing that someone else is activating it in real-time. That it's not a recording of a puppet or a set of instructions. I don't know, it touches on the "Caveman Effect"<sup>10</sup>, I think it's called. Something inherent.

This effect was also apparent in the performance video analysis. In one case, before a performer starts to read a line that should be said simultaneously by the two actors, they appear to be winking in the direction of the robotic puppet, as if there was another person there. When asked about this in the post-workshop interview, the participant noted that it was probably unintentional, and they were waiting for the co-actor to say something first. Another video shows Participant 23, with a background in dance, touching the puppet of their co-actor with their puppet during the performance. We asked to reflect on how this felt in the post-workshop interview:

**Participant 23 (IL):** I addressed their embodiment...I knew they were there...but I couldn't see what is happening outside, like I'm used to, to be honest, in dance. I don't have a real sense of what is happening outside.

Even when the performers were hidden behind the theater set, unable to see the audience (or the puppets), the presence of the audience, physically and online, affected the performance of the participants. In the post-workshop interview, participants reported thinking about the audience (both local and remote) while performing. The participants also discussed how to connect the experience between the audiences on both sides. In the group session of the "hippo and parrot" play, participants suggested inviting members of the audience to operate the puppet and perform with the remote actor.

**Participant 22 (IL):** Not letting just actors with scripts do that...now someone from the audience. Like I'm in Tel Aviv, I'm talking with someone from Ramallah, Bet Lehem, Jenin.

In the group session of the "falafel" team, multiple participants suggested that the audiences in both places should be able to see each other. This was summarized by Participant 8:

**Participant 8 (PS):** Maybe get them thinking about the other side...from another perspective. Like OK, I saw the scene and he saw the scene at the same time. What's his opinion on this? This offended me; would it offend him?

<sup>10</sup>This refers to the "caveman principle" by Michio Kaku in the 2011 book "Physics of the Future"

Finally, we asked the participants for their feedback on telerobotic technology and its use. The participants reported that the pneumatic actuation technology was fun and interesting, but in some cases difficult to use and cumbersome due to dependence on an air compressor. The participants also showed interest in adding more features to the telerobot, such as locomotion, touch feedback, machine translation, and voice modification.

### 5.3 Theme 3: The role of humor

The workshop had a playful nature, beginning with the experimentation of technology. Almost all of the interviewed participants described the technology positively, using words such as “funny”, “interesting”, “new”, and “crazy”. The video data also demonstrate a friendly and playful atmosphere, with several laughter moments while working with the technology. Humor also played a significant role in the production of puppet shows. However, there were some concerns that a humorous story should also be sensitive and maintain the reference to the conflict. For example, in the “office” team group discussion about the story, Participant 2 favored the use of ChatGPT to express serious thoughts about the conflict:

**Participant 2 (PS):** Let’s just be honest. Like [the humorous script] is nice, but I don’t know. It’s not that strong and connected to the conflict that much. Just more funny, like a funny scene that you see, drink beer....I mean, the conflict is already known...we understand it all...We just need someone to organize it. So, Chat[GPT], please, can you?

And in the post-workshop interview when we asked Participant 12 to reflect on the falafel story:

**Participant 12 (PS):** Honestly, I don’t know if our script really, like, showed something. Like I feel it was just funny, you know...It wasn’t, like, building toward something...an Israeli that hates Arabs and an Arab that hates Israelis, and a couple of years later they both agree on food...the food is falafel...one of the things that we divide over the most. It’s not real. It will never happen in real life.

The feeling of dissatisfaction with scripts that were “just funny” was more common among Palestinian participants. However, not all Palestinians shared this view. For example, in the post-workshop interview, Participant 9 expressed content with the falafel story:

**Participant 9 (PS):** It touched my heart.

**Interviewer:** Really?

**Participant 9 (PS):** I felt all the feelings when we did it. Because it’s something that really connected to our daily life, to our situation, so it’s really touching you from inside.

And Participant 1 was happy with the office scene:

**Interviewer:** When it was finally done...were you happy with the story?

**Participant 1 (PS):** I think it was fun. It was better than a serious story...There was a debate...about wanting to do something very serious and not include sarcasm or satire in the script...So we ended up doing [the funny script] and I was very happy about it because I wouldn’t want it to be serious...Yeah, there’s enough seriousness, I think.

Participant 12, who previously described the script as being “just funny”, reflected further on the balance between humor and sensitivity in the post-workshop interview when we asked them how the falafel script would be accepted in their local town.

**Participant 12 (PS):** as long as the Israeli is making sure that he is just delivering his emotions and thoughts, you know, and not saying anything remotely triggering or offensive to Arabs, then they will listen and it will get through...Because it’s through a puppet, I think that this aspect kind of makes it more comfortable... I mean, I know I said that they wouldn’t like it if we did the show



Fig. 6. Integrating textile-based soft actuators to the puppets. On the top: attaching the actuator to the foam-based head generates a movement for opening and closing the mouth. At the bottom left, the TPE bladder without a textile sleeve pushes the head of the hippo to open the mouth. At the bottom right: the textile sleeve was wrapped with felt to create a moving arm.

in [my local town], but I can also see them like laughing at dark jokes, you know, like dark humor jokes both about Jews and Arabs.

In the group session of the “office” play, participants discussed whether a satirical show of Israeli Jews and Palestinians would count as normalization of relations. Participant 7 (Israeli Jew, writer of the script) contended that it is not:

**Participant 7 (IL) :** It’s a strong comedy sketch, I don’t think it’s normalizing.

Although this was not explicitly agreed with by the Palestinian participants, they did support the humorous angle (later in the same discussion).

**Participant 3 (PS):** It will, like, break and and take that intensive feeling... if you use fun or jokes in the context.

**Participant 2 (PS):** Yeah, I agree. It’s black humor.

#### 5.4 Theme 4: Lessons for participatory design

Throughout the workshop, we sought to involve participants in the development of the research, technology, theoretical foundation, and workshop design. Having participants from different backgrounds contributed to the interdisciplinary nature of the work. Those with a background in engineering suggested ways to make the pneumatic circuit more efficient, others thought of ways to waste less of the textile and plastic materials, and a participant with a background in civil engineering and construction had ideas on improving the theater set. With the help of diverse skills, the teams came up with novel solutions to integrate actuators into puppets (see Figure 6). Participants also raised unconventional ideas for pneumatic soft actuators, including initiating a deliberate explosion of the puppet’s head as part of the storyline or using air pressure to blow bubbles in the air.

However, some participants, despite their hopes, did not have the time or opportunity to learn about the technology. Several participants reported that they did not imagine the workshop would be in the style of a “hackathon” - rushing to produce an outcome before the deadline, and that they were “missing out on the actually interesting part”. Some participants had more experience with crafting, design, or performance arts than with technology but hoped to step out of their comfort zone and work with technology. However, because the team was rushing to meet a deadline, they saw themselves as obligated to contribute using their strongest skills and let those with more experience in technology finish the work faster. In the mid-work group discussion, Participant 13 expressed their feeling:

**Participant 13 (II):** I feel like I’m hanging out with friends, but I didn’t enjoy so much the work because I felt like I’m not really learning. Like “must keep sewing! Have to keep sewing!”...And I don’t even do sewing like that when I do my sewing... I came because it was the robotics weekend that had to do stuff with crafts.

Some Palestinian participants reported on male dominance in technology. Palestinian women who wanted to work with technology felt that the opportunity was taken away from them because men took over. In some cases, it happened off-handedly and in some cases more bluntly.

## 6 DISCUSSION

### 6.1 Toward a telerobotic theater of the oppressed: becoming digital jokers

The findings from the workshop demonstrate the potential of telerobotic theater to facilitate intergroup contact in the two vectors studied in this paper: 1) in the collaborative process of making theater and technology and 2) by extending the reach of the production across borders. In line with the tenets of TO, participants found it easier to discuss aspects of the conflict through performance, and the theater design process helped raise various topics for discussion. In line with the tenets of intergroup contact, collaborating on technological making created a positive atmosphere and helped create friendships between the groups.

Evaluating the telerobotic component of the theater, the findings suggest that it is possible to create a meaningful contact even when the co-actors are not in the same environment. The performing teleoperator is not required to perceive the remote environment to sense the co-presence of the co-actor and the remote audience. This was due to the symmetric nature of the system and to the nature of traditional puppetry [76] in which the performers do not see the set nor the audience and operate primarily based on auditory feedback, similar to how a participant described their experience as a dance performer. Insofar as the puppeteers were immersed in the local performance, they experienced a “suspension of disbelief”; they were focusing on their physical environment, interacting with the audience and with the co-actor, rather than thinking about the remote environment. Furthermore, the discussions conducted by the participants regarding the possible scenarios of a remote performance in the outgroup enriched the intergroup dialogue and provided insight to take the theater productions to the next phase of a public performance.

The expansion of TO to the realm of technology requires an expansion of role of the facilitator, or the joker, into a digital joker. Apart from the traditional roles of the joker in navigating the unfolding theatrical drama to explore latent social and political quandaries, the digital joker also navigates the participants through novel technology. Taking into account our findings, this entails maintaining the playful technological atmosphere, open-ended experimentation, and assigning the diverse skills of the participants to the corresponding technological tasks. As the theatrical joker in TO, the digital joker could facilitate the crossing of boundaries between roles, professions, cultures, and genders in a technological environment and ensure that learning expectations are met. This includes ensuring a more gender-inclusive environment, considering that male dominance in technology is still present in HCI [88], in the maker movement [42], in developing economies [137], and in the Middle East [70, 100], and, correspondingly, encouraging more male involvement in arts and crafts. The promise of teaching the participants

about the latest robotic technologies was an important driver to motivate, empower, and build trust with the community. We cannot take for granted the willingness of peace NGOs to involve us as outsiders in their process and should not assume that research directly benefits them [58, 99]. Reports from HCI researchers suggest that it is not easy to obtain the trust of these organizations, especially within disadvantaged communities [54, 77].

Apart from the crossing of metaphorical boundaries, the digital joker is capable of facilitating the crossing of physical boundaries. With telerobotic technology, the digital joker can involve actors who are not physically together and introduce unheard voices to new audiences. This is done in three parts. First, by facilitating the creation of a digital environment that enables shared performances. Feedback from the participants expressed the desire to create a sense of co-presence also for the audiences through live video, enabling a shared viewing experience with the remote location. In this way, the audience may experience intergroup contact not just vicariously as bystanders but as participants. Second, the digital joker can time and target the audience's exposure to the intergroup context, as suggested by the participants. In "forum theater", the joker is defined as the mediator between the actors and the audience. Therefore, in a public performance, the digital joker could orchestrate the time and manner in which the identities of the remote puppet operators and their locations are revealed to the audience. Finally, keeping in mind the role of the original TO joker, a digital joker could also mediate the technology to the audience and participants. In the making phase, as was in this workshop, the joker can facilitate dialogue by discussing the hypothetical scenario of a remote performance. In the theater phase, this could mean inviting members of the audience to improvise and interact with the telepuppet, as suggested by the participants, or discussing technology inside the theater play itself, as was demonstrated with ChatGPT in the "office" play.

In the spirit of "forum theater" and the will of participants to involve the audience, telerobotic puppetry can open another dimension of participation via the Internet. If we were to take the puppet stage into the public sphere, we could perform not just with live actors using their hand-tracking devices but also with people from all over the world, using their mobile devices. Although this implies an asymmetric system, with an expected decrease in operator presence and equality, this kind of participation bestows a voice to virtually anyone and allows complete anonymity which may increase expression [125]. One possible design direction is the *Chorus* in the joker system [23]. Inspired by Greek tragedy, the chorus represents the voice of the masses. According to Boal, a play could have two choruses - each supporting an opposite side in the story - they may debate, comment, and interrupt the play. Therefore, in a public telerobotic theater, there could be protagonists (or protagonist and antagonist) as live puppeteers in two locations, two choruses open for connections online, and digital jokers who manage the theatrical scenarios and telerobotic communication - those could be us researchers or, for example, Tech2Peace members trained by us (see figure 7).

## 6.2 Humor and the joker system

The playful nature of the puppets and the technology lightened the atmosphere when working on the challenging topic of the Israeli-Palestinian conflict. However, the participants were at odds on whether a satirical and humorous script was meaningful enough to deal with the serious aspects of the conflict. These debates occurred mainly with Palestinian participants, when some contended that jokes alone are not enough to address the conflict. This observation corresponds to previous research findings [87, 124] that the disadvantaged group has a greater need to confront the conflict directly in dialogue than the advantaged group. However, some Palestinian participants were satisfied with an ironic and arguably more superficial play. It appears that the ability to touch on sensitive topics in a satirical manner made humor a powerful tool for issues that otherwise remain unspoken.

In the book *Radical Doubt*, Mady Schutzman argues: "The pedagogy of the Joker System is in many ways a pedagogy of humor"[121, 25]. Both comedians and TO jokers use methods such as paradoxical thinking, contradiction, and nonlinearity. TO jokers are constantly "playing" with the theatrical substance, breaking the rhythm, shuffling, and surprising. In similar ways, jokes derive laughter [19]. We saw this in the plays produced

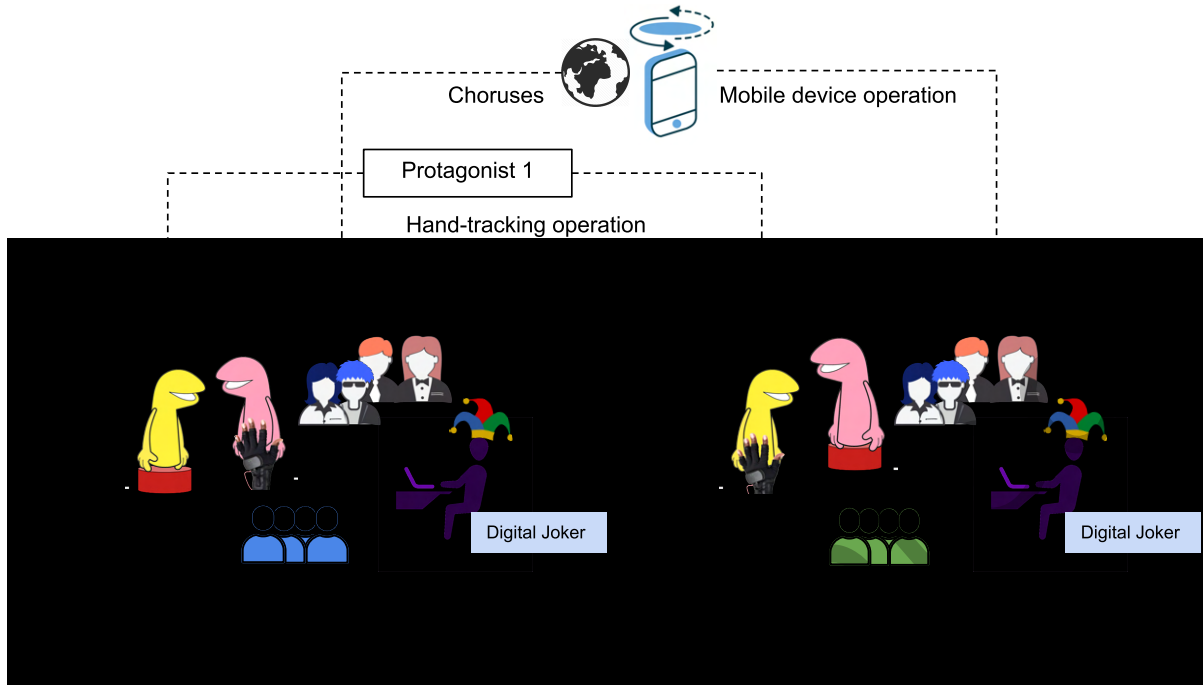


Fig. 7. An illustration for a telerobotic TO - Running in two stages simultaneously where each stage includes a hand-operated protagonist, a telerobotic protagonist, two mobile device-operated choruses, a Digital Joker, and an audience.

by the participants: the unrealistic bonding of the falafel salesmen or the idea of ChatGPT to resolve the conflict via mud wrestling. As Schutzman notes: “Jokes are about sidestepping the point” [121, p. 88]. The joint recognition of absurdities and contradictions without mentioning them by name has a bonding effect [121]. If we add to that the distancing effect of puppetry, which makes it easier to accept and communicate with the opposing group, we understand the points made by the participants that “there is enough seriousness”. Furthermore, the discussions by the participants suggest that not only the medium of puppetry but also the use of black humor could ease the path to acceptance of dialog between the groups, even to those who oppose any form of normalization of relations. The artist Marcel Duchamp described the evolution of his art style as opening a “corridor of humor” [101, p. 81]. When opposing views are fixed in their contradicting poles, they become a part of the same system. Through humor, Duchamp and his colleagues tried to break free from rigid patterns of thought.

### 6.3 Limitations and further research

The research presented in this paper is exploratory in nature. In the short time frame of this collaboration with Tech2Peace, we acquired valuable feedback that guides us in future designs and implementations. Due to the amount of time spent on creating the theaters, there were no opportunities to reflect, intervene, and improvise in the plays with the participants and the audience in real-time, as is customary in TO. Instead, we rely on the process that led the participants to premiere their creations. Furthermore, since this was only the first phase: the creation of the theater, we did not test the performance over the borders of Israel and Palestine with a public audience. Finally, since the workshop participants already had experience in dialogue with the other group, we could not study the full potential of the workshop to reduce prejudice and improve attitudes among

general populations, where disagreements could lead to more challenging clashes. However, despite the previous experience of participants in intergroup contact, the contribution of the proposed format to facilitate dialogue was clear. Crucially, we gained insight from the peacebuilding experience of the participants on how to use the medium, taking into account the known hurdles of intergroup conflict, and how to better organize the workshop. With all that, there is ample room left for exploration, not only in the Israeli-Palestinian conflict, but also in other regions where the two sides have limited ability to interact physically and locally.

In terms of technology, one vector of research left untouched is the involvement of ChatGPT or other generative AI in co-design and peacebuilding. In our workshop, we have seen generative AI enter the design process as a third party, occasionally helping the teams skip over time-consuming dilemmas or solve disagreements, albeit not all participants supported this strategy (as in the office scene). Other pathways of interest for telerobotic research include touch sensing and haptic feedback functions (for example, handshaking with the audience or with the other puppet), machine translation and voice altering, and improving the actuation implementation.

One of the core principles of participatory research is following up and maintaining a relationship with participants [32]. This practice is not only for the benefit of the research, but also for the empowerment of the community and the transition of power [85]. In that sense, the findings are only secondary to the pathways that opened through engagement with Tech2Peace and its community. After the study, we kept in contact with the participants, updating them on the progress of the research in our shared WhatsApp group, and discussing future directions. Four months after the study, the war broke out [31], and with it new challenges of gathering people to create the telerobotic theater. Faced with those, we now focus on measures that can make use of the research without physical meetups. Those include 1) Creating new bridges for activism through mobile remote puppeteering (similar to what we suggested for the chorus) and 2) Delegating upcoming stages to members of the Tech2Peace community so that they could conduct workshops in their localities. These two strategies expand the research to explore solutions for cases where direct intergroup contact is not possible. Together with the participants, we have also embraced a guiding principle to help us deal with the harsh reality: the insistence on opening corridors of humor, even when it seems futile.

## ACKNOWLEDGMENTS

This research is supported by the Kone foundation. We deeply thank Battya Dezabeli from *Craftoola* and the Tech2Peace staff for their collaboration and hospitality. We are grateful for the support of our mentors: Marian Boo, Nimrod Keret, Ivan Lukomskiy, Jeremy Rutman, and Neora Shem Shaul. Special thanks go to: Avner Holdengraber, Adnan Jaber, Emmi Pouta, Arik Segal, Salla-Maaria Syvänen, and USK. The workshop was also supported by the educational program of The New Israel Fund (NIF) Deutschland, represented by Jan-Hinrich Wagner and Nathaniel Ngomane. The use of the motion capture gloves was supported by MAGICS, national infrastructure for human in the digital world. Finally, we thank all the workshop participants who enabled the writing of this paper and inspired us for the future.

## REFERENCES

- [1] Wifag Adnan. 2022. From Economic Integration to Near Elimination: The Economic Consequences of Isolation. *The Journal of Development Studies* 58, 6 (2022), 1160–1180.
- [2] Vonzell Agosto, LaSonja Roberts, María Migueliz Valcarlos, Tara Nkrumah, Tanetha Grosland, Andrew Bratspis, Nathalie Warren, and Edwin Reynolds. 2022. Jokering Bodies. *International Review of Qualitative Research* 14, 4 (Feb. 2022), 708–727. <https://doi.org/10.1177/19408447211049508>
- [3] Sarah Fdili Alaoui and Jean-Marc Matos. 2021. RCO : Investigating Social and Technological Constraints through Interactive Dance. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–13. <https://doi.org/10.1145/3411764.3445513>
- [4] Mai Albzour, Zacharia Bady, Guy Elchereth, Sandra Penic, Nils Reimer, and Eva G. T. Green. 2022. Talking to a (Segregation) Wall: Intergroup Contact and Attitudes Toward Normalization Among Palestinians From the Occupied Territories. *Political Psychology* 0, 0



- (2022). <https://doi.org/10.1111/pops.12816>
- [5] Mai Albzour, Sandra Penic, Randa Nasser, and Eva G. T. Green. 2019. Support for "Normalization" of Relations Between Palestinians and Israelis, and How It Relates to Contact and Resistance in the West Bank. *Journal of Social and Political Psychology* 7, 2 (Dec. 2019), 978–996. <https://doi.org/10.5964/jsp.p.v7i2.877>
  - [6] Gordon W Allport. 1954. *The Nature of Prejudice*. Addison-Wesley, Oxford, England.
  - [7] Luis Almeida, Paulo Menezes, and Jorge Dias. 2022. Telepresence Social Robotics towards Co-Presence: A Review. *Applied Sciences* 12, 11 (Jan. 2022), 5557. <https://doi.org/10.3390/app12115557>
  - [8] Chen Alon. 2011. CHAPTER FOURTEEN: Non-Violent Struggle as Reconciliation Combatants for Peace: Palestinian and Israeli Polarized Theatre of the Oppressed. *Counterpoints* 416 (2011), 161–172. jstor:42981337
  - [9] Chen Alon, A. Citron, and D. Zerbib. 2014. Dismantling Road Blocks: Non-Violent Resistance of the Palestinian-Israeli Group 'Combatants for Peace'. *Performance Studies in Motion: International Perspectives and Practices in the Twenty-First Century* (2014), 194–205.
  - [10] Adriana Alvarado Garcia, Ivana Feldfeber, Milagros Miceli, Saide Mobayed, and Helena Suárez Val. 2022. Crossing Data: Building Bridges with Activist and Academic Practices from and for Latin America (Cruzar Datos: Tendiendo Puentes Con Prácticas Activistas y Académicas Desde y Para América Latina). In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*. ACM, New Orleans LA USA, 1–6. <https://doi.org/10.1145/3491101.3505222>
  - [11] M Aronoff. 1996. Puppetry as a Therapeutic Medium: An Introduction. *British Journal of Therapy and Rehabilitation* 3, 4 (April 1996), 210–214. <https://doi.org/10.12968/bjtr.1996.3.4.14843>
  - [12] Mariam Asad. 2019. Prefigurative Design as a Method for Research Justice. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (Nov. 2019), 1–18. <https://doi.org/10.1145/3359302>
  - [13] Edward E. Azar, Paul Jureidini, and Ronald McLaurin. 1978. Protracted Social Conflict; Theory and Practice in the Middle East. *Journal of Palestine Studies* 8, 1 (Oct. 1978), 41–60. <https://doi.org/10.2307/2536101>
  - [14] Daniel Bar-Tal. 2000. From Intractable Conflict Through Conflict Resolution To Reconciliation: Psychological Analysis. *Political Psychology* 21, 2 (June 2000), 351–365. <https://doi.org/10.1111/0162-895X.00192>
  - [15] Daniel Bar-Tal, Boaz Hameiri, and Eran Halperin. 2021. Chapter Three - Paradoxical Thinking as a Paradigm of Attitude Change in the Context of Intractable Conflict. In *Advances in Experimental Social Psychology*, Bertram Gawronski (Ed.). Vol. 63. Academic Press, 129–187. <https://doi.org/10.1016/bs.aesp.2020.11.003>
  - [16] Jaclyn Barnes, Maryam S. FakhrHosseini, Eric Vasey, Zackery Duford, and Myoungsoon Jeon. 2017. Robot Theater with Children for STEAM Education. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 61, 1 (Sept. 2017), 875–879. <https://doi.org/10.1177/1541931213601511>
  - [17] Steve Benford, Chris Greenhalgh, Bob Anderson, Rachel Jacobs, Mike Golembewski, Marina Jirotko, Bernd Carsten Stahl, Job Timmermans, Gabriella Giannachi, Matt Adams, Ju Row Farr, Nick Tandavanitj, and Kirsty Jennings. 2015. The Ethical Implications of HCI's Turn to the Cultural. *ACM Transactions on Computer-Human Interaction* 22, 5 (Sept. 2015), 1–37. <https://doi.org/10.1145/2775107>
  - [18] Steve Benford, Chris Greenhalgh, Andy Crabtree, Martin Flintham, Brendan Walker, Joe Marshall, Boriana Koleva, Stefan Rennick Egglestone, Gabriella Giannachi, Matt Adams, Nick Tandavanitj, and Ju Row Farr. 2013. Performance-Led Research in the Wild. *ACM Transactions on Computer-Human Interaction* 20, 3 (July 2013), 14:1–14:22. <https://doi.org/10.1145/2491500.2491502>
  - [19] Henri Bergson, Cloudesley Shovell Henry Brereton, and Fred Rothwell. 1914. *Laughter: An Essay on the Meaning of the Comic*. Macmillan.
  - [20] Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren. 2010. Participatory Design and "Democratizing Innovation". In *Proceedings of the 11th Biennial Participatory Design Conference*. ACM, Sydney Australia, 41–50. <https://doi.org/10.1145/1900441.1900448>
  - [21] Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren. 2012. Agonistic Participatory Design: Working with Marginalised Social Movements. *CoDesign* 8, 2-3 (June 2012), 127–144. <https://doi.org/10.1080/15710882.2012.672577>
  - [22] Mark Blythe, Kristina Andersen, Rachel Clarke, and Peter Wright. 2016. Anti-Solutionist Strategies: Seriously Silly Design Fiction. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. Association for Computing Machinery, New York, NY, USA, 4968–4978. <https://doi.org/10.1145/2858036.2858482>
  - [23] Augusto Boal. 2008. *Theatre of the Oppressed* (new edition ed.). Number 6 in Get Political. Pluto Press, London.
  - [24] Augusto Boal and Adrian Jackson. 2021. *Games for Actors and Non-Actors* (3 ed.). Routledge, London. <https://doi.org/10.4324/9780429261053>
  - [25] Andriana Boudouraki, Houda Elmimouni, Marta Orduna, Pablo Perez, Ester Gonzalez-Sosa, Pablo Cesar, JesÚS Guti  rrez, Taffeta Wood, Ver  nica Ahumada-Newhart, and Joel E Fischer. 2023. Emerging Telepresence Technologies for Hybrid Meetings: An Interactive Workshop. In *Companion Publication of the 2023 Conference on Computer Supported Cooperative Work and Social Computing (CSCW '23 Companion)*. Association for Computing Machinery, New York, NY, USA, 547–552. <https://doi.org/10.1145/3584931.3611283>
  - [26] Virginia Braun and Victoria Clarke. 2006. Using Thematic Analysis in Psychology. *Qualitative Research in Psychology* 3, 2 (Jan. 2006), 77–101. <https://doi.org/10.1191/1478088706qp0630a>

- [27] Virginia Braun and Victoria Clarke. 2019. Reflecting on Reflexive Thematic Analysis. *Qualitative Research in Sport, Exercise and Health* 11, 4 (Aug. 2019), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>
- [28] Bertolt Brecht. 1964. *Brecht on Theatre*, Trans. John Willett. New York: Hill and Wang.
- [29] E. Broadbent, R. Stafford, and B. MacDonald. 2009. Acceptance of Healthcare Robots for the Older Population: Review and Future Directions. *International Journal of Social Robotics* 1, 4 (Oct. 2009), 319. <https://doi.org/10.1007/s12369-009-0030-6>
- [30] Rupert Brown and Miles Hewstone. 2005. An Integrative Theory of Intergroup Contact. *Advances in experimental social psychology* 37, 37 (2005), 255–343.
- [31] Daniel Byman. 2024. A War They Both Are Losing: Israel, Hamas and the Plight of Gaza. *Survival* 66, 3 (May 2024), 61–78. <https://doi.org/10.1080/00396338.2024.2357484>
- [32] Caitlin Cahill. 2007. Including Excluded Perspectives in Participatory Action Research. *Design Studies* 28, 3 (May 2007), 325–340. <https://doi.org/10.1016/j.destud.2007.02.006>
- [33] Leonardo Cappello, Kevin C. Galloway, Siddharth Sanan, Diana A. Wagner, Rachael Granberry, Sven Engelhardt, Florian L. Haufe, Jeffrey D. Peisner, and Conor J. Walsh. 2018. Exploiting Textile Mechanical Anisotropy for Fabric-Based Pneumatic Actuators. *Soft Robotics* 5, 5 (Oct. 2018), 662–674. <https://doi.org/10.1089/soro.2017.0076>
- [34] Leonardo Cappello, Jan T. Meyer, Kevin C. Galloway, Jeffrey D. Peisner, Rachael Granberry, Diana A. Wagner, Sven Engelhardt, Sabrina Paganoni, and Conor J. Walsh. 2018. Assisting Hand Function after Spinal Cord Injury with a Fabric-Based Soft Robotic Glove. *Journal of NeuroEngineering and Rehabilitation* 15, 1 (June 2018), 59. <https://doi.org/10.1186/s12984-018-0391-x>
- [35] Elisa Cavatorta and Ben Groom. 2024. An Analysis of Changing Israeli and Palestinian Attitudes towards Peace. <https://www.lse.ac.uk/middle-east-centre/publications/paper-series>.
- [36] I-Ming Chen, Raymond Tay, Shusong Xing, and Song Huat Yeo. 2004. Marionette: From Traditional Manipulation to Robotic Manipulation. In *International Symposium on History of Machines and Mechanisms: Proceedings HMM2004*. Springer, Dordrecht, 119–133.
- [37] Justin Chun-Ting Cheung, Vivian Wei-Qun Lou, Dong-Yuan Hu, Nicol Fu Chun Pan, Esther Mei Wa Woo, and Michael Sai Fuk Cheng. 2023. Eliminating Ageism in Higher Education: An Intergenerational Participatory Co-design Project. *Educational Gerontology* 49, 11 (Nov. 2023), 966–978. <https://doi.org/10.1080/03601277.2023.2187107>
- [38] Greg Dimitriadis. 2006. Pedagogy on the Move: New Intersections in (between) the Educative and the Performative. *The Sage handbook of performance studies* (2006), 296–308.
- [39] Carl DiSalvo. 2010. Design, Democracy and Agonistic Pluralism. In *DRS Biennial Conference Series*. Montreal, Canada.
- [40] Carl DiSalvo, Andrew Clement, and Volkmar Pipek. 2012. Participatory Design for, with, and by Communities. In *International Handbook of Participatory Design*. Routledge Oxford, 182–209.
- [41] Ana Maria Bustamante Duarte, Nina Brendel, Auriol Degbello, and Christian Kray. 2018. Participatory Design and Participatory Research: An HCI Case Study with Young Forced Migrants. *ACM Transactions on Computer-Human Interaction (TOCHI)* 25, 1 (2018), 1–39.
- [42] Jennifer Eckhardt, Christoph Kaletka, Bastian Pelka, Elisabeth Unterfrauner, Christian Voigt, and Marthe Zirngiebl. 2021. Gender in the Making: An Empirical Approach to Understand Gender Relations in the Maker Movement. *International Journal of Human-Computer Studies* 145 (Jan. 2021), 102548. <https://doi.org/10.1016/j.ijhcs.2020.102548>
- [43] Sara Eriksson, Åsa Unander-Scharin, Vincent Trichon, Carl Unander-Scharin, Hedvig Kjellström, and Kristina Höök. 2019. Dancing With Drones: Crafting Novel Artistic Expressions Through Intercorporeality. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. Association for Computing Machinery, New York, NY, USA, 1–12. <https://doi.org/10.1145/3290605.3300847>
- [44] Sara Falcone, Gwenn Englebienné, Jan Van Erp, and Dirk Heylen. 2022. Toward Standard Guidelines to Design the Sense of Embodiment in Teleoperation Applications: A Review and Toolbox. *Human-Computer Interaction* 0, 0 (March 2022), 1–30. <https://doi.org/10.1080/07370024.2022.2039147>
- [45] Gwenaëlle Ferré. 2019. Féminisme-Enjeux: Challenges and Paradoxes of a Feminist Theatre of the Oppressed Company. In *The Routledge Companion to Theatre of the Oppressed*. Routledge, 375–380.
- [46] Mary Flanagan and Helen Nissenbaum. 2007. A Game Design Methodology to Incorporate Social Activist Themes. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '07)*. Association for Computing Machinery, New York, NY, USA, 181–190. <https://doi.org/10.1145/1240624.1240654>
- [47] Paulo Freire. 2000. *Pedagogy of the Oppressed* (30th anniversary ed ed.). Continuum, New York.
- [48] Dan Friedman. 2021. *Performance Activism: Precursors and Contemporary Pioneers*. Springer International Publishing, Cham. <https://doi.org/10.1007/978-3-030-80591-3>
- [49] Christiane J. Fröhlich. 2012. Security and Discourse: The Israeli–Palestinian Water Conflict. *Conflict, Security & Development* 12, 2 (May 2012), 123–148. <https://doi.org/10.1080/14678802.2012.688290>
- [50] Zeina B. Ghandour. 2013. Falafel King: Culinary Customs and National Narratives in Palestine (I). *Feminist Legal Studies* 21, 3 (Oct. 2013), 281–301. <https://doi.org/10.1007/s10691-013-9250-0>

- [51] David Grant. 2020. 'Objects with Objectives': Applied Puppetry from Practice into Theory. *Applied Theatre Research* 8, 1 (July 2020), 13–29. [https://doi.org/10.1386/at\\_r\\_00023\\_1](https://doi.org/10.1386/at_r_00023_1)
- [52] Victoria Groom, Leila Takayama, Paloma Ochi, and Clifford Nass. 2009. I Am My Robot: The Impact of Robot-Building and Robot Form on Operators. In *Proceedings of the 4th ACM/IEEE International Conference on Human Robot Interaction - HRI '09*. ACM Press, La Jolla, California, USA, 31. <https://doi.org/10.1145/1514095.1514104>
- [53] Lisa A Guion. 2002. Triangulation: Establishing the Validity of Qualitative Studies. (2002).
- [54] Selin Gürdere Akdur. 2023. Stakeholders' Involvement in Social Design Practices in Turkey. *The Design Journal* 0, 0 (June 2023), 1–20. <https://doi.org/10.1080/14606925.2023.2225707>
- [55] R. Hakli, P. Mäkelä, and J. Seibt. 2023. *Social Robots in Social Institutions: Proceedings of Robophilosophy 2022*. IOS Press.
- [56] Ariel Handel. 2014. Gated/Gating Community: The Settlement Complex in the West Bank. *Transactions of the Institute of British Geographers* 39, 4 (2014), 504–517. <https://doi.org/10.1111/tran.12045>
- [57] B. Hannaford. 2000. *Feeling Is Believing: A History of Telerobotics. The Robot in the Garden: Telerobotics and Telepistemology in the Age of the Internet*. Edited by Ken Goldberg. The MIT Press.
- [58] Christina Harrington, Sheena Erete, and Anne Marie Piper. 2019. Deconstructing Community-Based Collaborative Design: Towards More Equitable Participatory Design Engagements. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (Nov. 2019), 1–25. <https://doi.org/10.1145/3359318>
- [59] Tabea Hässler, Özden Melis Uluğ, Mariska Kappmeier, and Giovanni A. Travaglino. 2021. Intergroup Contact and Social Change: An Integrated Contact-Collective Action Model. *Journal of Social Issues* 77, 1 (March 2021), 217–241. <https://doi.org/10.1111/josi.12412>
- [60] Gillian R. Hayes. 2011. The Relationship of Action Research to Human-Computer Interaction. *ACM Transactions on Computer-Human Interaction* 18, 3 (Aug. 2011), 15:1–15:20. <https://doi.org/10.1145/1993060.1993065>
- [61] O. Blanson Henkemans, M. Neerincx, S. Pal, R. Van Dam, J. Shin Hong, E. Oleari, C. Pozzi, F. Sardu, and F. Sacchitelli. 2016. *Co-Design of the Pal Robot and Avatar That Perform Joint Activities with Children for Improved Diabetes Self-Management*. New York: IEEE Press.
- [62] Juan Pablo Hourcade and Natasha E. Bullock-Rest. 2011. HCI for Peace: A Call for Constructive Action. In *Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems - CHI '11*. ACM Press, Vancouver, BC, Canada, 443. <https://doi.org/10.1145/1978942.1979005>
- [63] Kelly Howe, Julián Boal, and José Soeiro. 2019. *The Routledge Companion to Theatre of the Oppressed*. Routledge.
- [64] Jwu-Sheng Hu, Jyun-Ji Wang, and Guan-Qun Sun. 2008. The Glove Puppet Robot: X-puppet. In *2008 IEEE/RSJ International Conference on Intelligent Robots and Systems*. IEEE, Nice, France, 4145–4146.
- [65] Charles E. Hughes. 2014. Human Surrogates: Remote Presence for Collaboration and Education in Smart Cities. In *Proceedings of the 1st International Workshop on Emerging Multimedia Applications and Services for Smart Cities - EMASC '14*. ACM Press, Orlando, Florida, USA, 1–2. <https://doi.org/10.1145/2661704.2661712>
- [66] Lillian Hung, Grace Hu, Joey Wong, Haopu Ren, Nazia Ahmed, Ali Hussein, Erika Young, Annette Berndt, Jim Mann, Rekesh Corepal, and Lily Wong. 2023. Telepresence Robots in Long-Term Care Settings in British Columbia During the COVID-19 Pandemic: Analyzing the Experiences of Residents and Family Members. *Gerontology and Geriatric Medicine* 9 (Jan. 2023), 23337214231166208. <https://doi.org/10.1177/23337214231166208>
- [67] Chiara Imperato, Barry H. Schneider, Luca Caricati, Yair Amichai-Hamburger, and Tiziana Mancini. 2021. Allport Meets Internet: A Meta-Analytical Investigation of Online Intergroup Contact and Prejudice Reduction. *International Journal of Intercultural Relations* 81 (March 2021), 131–141. <https://doi.org/10.1016/j.ijintrel.2021.01.006>
- [68] Rachel Jacobs, Steve Benford, Ewa Luger, and Candice Howarth. 2016. The Prediction Machine: Performing Scientific and Artistic Process. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems (DIS '16)*. Association for Computing Machinery, New York, NY, USA, 497–508. <https://doi.org/10.1145/2901790.2901825>
- [69] Elizabeth Jochum, Jarvis Schultz, Elliot Johnson, and T. D. Murphey. 2014. Robotic Puppets and the Engineering of Autonomous Theater. In *Controls and Art: Inquiries at the Intersection of the Subjective and the Objective*, Amy LaViers and Magnus Egerstedt (Eds.). Springer International Publishing, Cham, 107–128. [https://doi.org/10.1007/978-3-319-03904-6\\_5](https://doi.org/10.1007/978-3-319-03904-6_5)
- [70] Ridhi Kashyap and Florianne C. J. Verkroost. 2021. Analysing Global Professional Gender Gaps Using LinkedIn Advertising Data. *EPJ Data Science* 10, 1 (Dec. 2021), 39. <https://doi.org/10.1140/epjds/s13688-021-00294-7>
- [71] Raghav Kasibhatla, Saifuddin Mahmud, Redwanul Haque Sourave, Marcus Arnett, and Jong-Hoon Kim. 2021. Design of a Smart Puppet Theatre System for Computational Thinking Education. In *Intelligent Human Computer Interaction: 13th International Conference, IHCI 2021, Kent, OH, USA, December 20–22, 2021, Revised Selected Papers*. Springer-Verlag, Berlin, Heidelberg, 301–312. [https://doi.org/10.1007/978-3-030-98404-5\\_29](https://doi.org/10.1007/978-3-030-98404-5_29)
- [72] Anastasia J. Khawaja, Valerie S. Jakar, and Brigitta R. Schvarcz. 2021. English as a Mediator for Communication and Understanding: The Case of Israel and Palestine. In *Policy Development in TESOL and Multilingualism: Past, Present and the Way Forward*, Kashif Raza, Christine Coombe, and Dudley Reynolds (Eds.). Springer Nature, Singapore, 217–230. [https://doi.org/10.1007/978-981-16-3603-5\\_17](https://doi.org/10.1007/978-981-16-3603-5_17)
- [73] Sangjin Ko, Haley Swaim, Harsh Sanghavi, Jiayuan Dong, Chihab Nadri, and Myoungsoon Jeon. 2020. Robot-Theater Programs for Different Age Groups to Promote STEAM Education and Robotics Research. In *Companion of the 2020 ACM/IEEE International*

- Conference on Human-Robot Interaction (HRI '20)*. Association for Computing Machinery, New York, NY, USA, 299–301. <https://doi.org/10.1145/3371382.3378353>
- [74] David Kretzmer. 2017. Settlements in the Supreme Court of Israel. 111 (Jan. 2017), 41–44. <https://doi.org/10.1017/aju.2017.17>
- [75] Marie Kruger. 2016. Puppets and Politics: Finding a Platform for Rebellious Voices in South Africa. In *ICHSC2016*. Phuket.
- [76] George Latshaw. 2000. *The Complete Book of Puppetry*. Courier Corporation.
- [77] Debora De Castro Leal, Angelika Strohmayer, and Max Krüger. 2021. On Activism and Academia: Reflecting Together and Sharing Experiences Among Critical Friends. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–18. <https://doi.org/10.1145/3411764.3445263>
- [78] Minha Lee, Débora De Castro Leal, Max Krüger, Angelika Strohmayer, and Cristina Zaga. 2021. Activated: Decentering Activism in and with Academia. In *Companion Publication of the 2021 Conference on Computer Supported Cooperative Work and Social Computing*. ACM, Virtual Event USA, 343–346. <https://doi.org/10.1145/3462204.3481723>
- [79] Min Kyung Lee and Leila Takayama. 2011. "Now, i Have a Body": Uses and Social Norms for Mobile Remote Presence in the Workplace. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '11)*. Association for Computing Machinery, New York, NY, USA, 33–42. <https://doi.org/10.1145/1978942.1978950>
- [80] Ming Lei, Ian M. Clemente, Haixia Liu, and John Bell. 2022. The Acceptance of Telepresence Robots in Higher Education. *International Journal of Social Robotics* 14, 4 (Jan. 2022), 1025–1042. <https://doi.org/10.1007/s12369-021-00837-y>
- [81] Séverin Lemaignan, Mamoun Gharbi, Jim Mainprice, Matthieu Herrb, and Rachid Alami. 2012. Roboscopia: A Theatre Performance for a Human and a Robot. In *Proceedings of the Seventh Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI '12)*. Association for Computing Machinery, New York, NY, USA, 427–428. <https://doi.org/10.1145/2157689.2157831>
- [82] Janika Leoste, Kaido Kikkas, Kalle Tammemäe, Martin Rebane, Edmund Laugasson, and Kristiina Hakk. 2022. Telepresence Robots in Higher Education—the Current State of Research. In *International Conference on Robotics in Education (RiE)*. Springer International Publishing, Cham, 124–134.
- [83] Huahui Liu, Yingying She, Lin Lin, Shizhang Chen, Jin Chen, Xiaomeng Xu, and Jiayu Lin. 2019. HinHRob: A Performance Robot for Glove Puppetry. In *SIGGRAPH Asia 2019 Posters*. ACM, Brisbane QLD Australia, 1–2. <https://doi.org/10.1145/3355056.3364595>
- [84] Teresa Macchia, Vincenzo D'Andrea, Roberto Mazzini, Angela Di Fiore, and Michela Cozza. 2016. Exploring Theater of the Oppressed for Participatory Design. In *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops - Volume 2*. ACM, Aarhus Denmark, 125–126. <https://doi.org/10.1145/2948076.2948105>
- [85] Henry Mainsah and Andrew Morrison. 2014. Participatory Design through a Cultural Lens: Insights from Postcolonial Theory. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium Papers, and Keynote Abstracts - Volume 2 (PDC '14)*. Association for Computing Machinery, New York, NY, USA, 83–86. <https://doi.org/10.1145/2662155.2662195>
- [86] Ifat Maoz. 2005. Evaluating the Communication between Groups in Dispute: Equality in Contact Interventions between Jews and Arabs in Israel. *Negotiation Journal* 21, 1 (2005), 131–146. <https://doi.org/10.1111/j.1571-9979.2005.00050.x>
- [87] Ifat Maoz. 2011. Does Contact Work in Protracted Asymmetrical Conflict? Appraising 20 Years of Reconciliation-Aimed Encounters between Israeli Jews and Palestinians. *Journal of Peace Research* 48, 1 (Jan. 2011), 115–125. <https://doi.org/10.1177/0022343310389506>
- [88] Dana McKay, Huiwen Zhang, and George Buchanan. 2022. Who Am I, and Who Are You, and Who Are We? A Scientometric Analysis of Gender and Geography in HCI. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–19. <https://doi.org/10.1145/3491102.3502106>
- [89] Mahmoud Mi'Ari. 1999. Attitudes of Palestinians toward Normalization with Israel. *Journal of Peace Research* 36, 3 (May 1999), 339–348. <https://doi.org/10.1177/0022343399036003006>
- [90] Francois Michaud, Patrick Boissy, Daniel Labonte, Helene Corriveau, Andrew Grant, Michel Lauria, Richard Cloutier, Marc-André Roux, Daniel Iannuzzi, and Marie-Pier Royer. 2007. Telepresence Robot for Home Care Assistance.. In *AAAI Spring Symposium: Multidisciplinary Collaboration for Socially Assistive Robotics*. California, USA, 50–55.
- [91] Sandra Mills. 2009. Theatre for Transformation and Empowerment: A Case Study of Jana Sanskriti Theatre of the Oppressed. *Development in Practice* 19, 4-5 (2009), 550–559.
- [92] Marvin Minsky. 1980. Telepresence. *Omni* 1980, 06 (June 1980), 44–52.
- [93] Zevic Mishor. 2015. Digging the Well Deep: The Jewish "Ultra-Orthodox" Relationship with the Divine Explored through the Lifeworld of the Breslov Chasidic Community in Safed. (July 2015).
- [94] Maggie Morgan, Chris Martin, Marilyn McGee-Lennon, Julia Clark, Nick Hine, Maria Wolters, and John Arnott. 2008. Requirements Gathering with Diverse User Groups and Stakeholders. In *CHI '08 Extended Abstracts on Human Factors in Computing Systems (CHI EA '08)*. Association for Computing Machinery, New York, NY, USA, 2597–2600. <https://doi.org/10.1145/1358628.1358720>
- [95] Arjun Nagendran, Anthony Steed, Brian Kelly, and Ye Pan. 2015. Symmetric Telepresence Using Robotic Humanoid Surrogates: Robotic Symmetric Telepresence. *Computer Animation and Virtual Worlds* 26, 3-4 (May 2015), 271–280. <https://doi.org/10.1002/cav.1638>
- [96] Carman Neustaedter, Samarth Singhal, Rui Pan, Yasamin Heshmat, Azadeh Forghani, and John Tang. 2018. From Being There to Watching: Shared and Dedicated Telepresence Robot Usage at Academic Conferences. *ACM Transactions on Computer-Human*

- Interaction* 25, 6 (Dec. 2018), 33:1–33:39. <https://doi.org/10.1145/3243213>
- [97] Kohei Ogawa, Shuichi Nishio, Kensuke Koda, Koichi Taura, Takashi Minato, Carlos Toshinori Ishii, and Hiroshi Ishiguro. 2011. Telenoid: Tele-Presence Android for Communication. In *ACM SIGGRAPH 2011 Emerging Technologies on - SIGGRAPH '11*. ACM Press, Vancouver, British Columbia, Canada, 1–1. <https://doi.org/10.1145/2048259.2048274>
- [98] OpenAI. 2023. GPT-4 Technical Report. <https://doi.org/10.48550/arXiv.2303.08774> arXiv:2303.08774 [cs]
- [99] Joyojeet Pal. 2017. CHI4Good or Good4CHI. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17)*. Association for Computing Machinery, New York, NY, USA, 709–721. <https://doi.org/10.1145/3027063.3052766>
- [100] Louise Patterson, Damodharan Sowmya Varadarajan, and Beena Saji Salim. 2020. Women in STEM/SET: Gender Gap Research Review of the United Arab Emirates (UAE) – a Meta-Analysis. *Gender in Management: An International Journal* 36, 8 (Jan. 2020), 881–911. <https://doi.org/10.1108/GM-11-2019-0201>
- [101] Octavio Paz. 1990. *Marcel Duchamp: Appearance Stripped Bare*. Arcade Publishing.
- [102] Avner Peled, Teemu Leinonen, and Béatrice S. Hasler. 2022. The Telerobot Contact Hypothesis. In *Computer-Human Interaction Research and Applications: 4th International Conference, CHIRA 2020, Virtual Event, November 5–6, 2020, Revised Selected Papers*. Springer, 74–99.
- [103] Avner Peled, Teemu Leinonen, and Béatrice S. Hasler. 2024. Telerobotic Intergroup Contact: Acceptance and Preferences in Israel and Palestine. *Behavioral Sciences* 14, 9 (Sept. 2024), 854. <https://doi.org/10.3390/bs14090854>
- [104] Leonor Pereira da Costa, Kinga Bierwaczzonek, and Mauro Bianchi. 2024. Does Digital Intergroup Contact Reduce Prejudice? A Meta-Analysis. *Cyberpsychology, Behavior and Social Networking* 27, 7 (July 2024), 440–451. <https://doi.org/10.1089/cyber.2023.0591>
- [105] Adrian Petterson, Ashique Ali Thuppalikkat, Paridhi Gupta, Shamika Klassen, Margaret C Jack, Jun Liu, and Priyank Chandra. 2023. Supporting Social Movements Through HCI and Design. In *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*. ACM, Hamburg Germany, 1–5. <https://doi.org/10.1145/3544549.3573812>
- [106] Thomas F. Pettigrew. 1998. Intergroup Contact Theory. *Annual review of psychology* 49, 1 (1998), 65–85.
- [107] Benjamin Pogrund. 2008. 1948: Independence and the Nakba. *Palestine-Israel Journal of Politics, Economics, and Culture* 15, 1/2 (2008), 107.
- [108] Sabine Preuß and Melanie C. Steffens. 2020. A Video Intervention for Every Straight Man: The Role of Preattitudes and Emotions in Vicarious-Contact Effects. *Group Processes & Intergroup Relations* 24, 6 (June 2020), 921–944. <https://doi.org/10.1177/1368430220910462>
- [109] Laura Purcell-Gates and Matt Smith. 2020. Applied Puppetry: Communities, Identities, Transgressions. *Applied Theatre Research* 8, 1 (July 2020), 3–11. [https://doi.org/10.1386/atr\\_00022\\_2](https://doi.org/10.1386/atr_00022_2)
- [110] Peter Reason. 1994. Three Approaches to Participative Inquiry. In *Handbook of Qualitative Research*. Sage Publications, Inc, Thousand Oaks, CA, US, 324–339.
- [111] Natalia Reich-Stiebert, Friederike Eyssel, and Charlotte Hohnemann. 2019. Involve the User! Changing Attitudes toward Robots by User Participation in a Robot Prototyping Process. *Computers in Human Behavior* 91 (Feb. 2019), 290–296. <https://doi.org/10.1016/j.chb.2018.09.041>
- [112] Mohammad Rashidujjaman Rifat, Reem Ayad, Ashratuz Zavin Asha, Bingjian Huang, Selin Okman, Dina Sabie, Hasan Shahid Ferdous, Robert Soden, and Syed Ishtiaque Ahmed. 2024. Cohabitant: The Design, Implementation, and Evaluation of a Virtual Reality Application for Interfaith Learning and Empathy Building. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–19. <https://doi.org/10.1145/3613904.3642821>
- [113] Asreen Rostami and Donald McMillan. 2022. The Normal Natural Troubles of Virtual Reality in Mixed-Reality Performances. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–22. <https://doi.org/10.1145/3491102.3502139>
- [114] Katy Rubin. 2019. Theatre of the Oppressed NYC: Radical Partnerships on the Ground in New York City. In *The Routledge Companion to Theatre of the Oppressed*. Routledge, 414–419.
- [115] Mose Sakashita, Tatsuya Minagawa, Amy Koike, Ippei Suzuki, Keisuke Kawahara, and Yoichi Ochiai. 2017. You as a Puppet: Evaluation of Telepresence User Interface for Puppetry. In *Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology*. ACM, Québec City QC Canada, 217–228. <https://doi.org/10.1145/3126594.3126608>
- [116] Elaheh Sanoubari, Amanda Johnson, John Edison Munoz, Andrew Houston, and Kerstin Dautenhahn. 2023. Using Robot-Mediated Applied Drama to Foster Anti-Bullying Peer Support. In *Frontiers in Artificial Intelligence and Applications*, Raul Hakli, Pekka Mäkelä, and Johanna Seibt (Eds.). IOS Press. <https://doi.org/10.3233/FAIA220618>
- [117] Peter Schumann. 1970. Bread and Puppets. *The Drama Review* 14, 3 (1970), 35–35.
- [118] Peter Schumann. 1991. The Radicality of the Puppet Theatre. *TDR (1988-)* 35, 4 (1991), 75. <https://doi.org/10.2307/1146164> jstor:1146164
- [119] Mady Schutzman. 2006. Ambulant Pedagogy. *The Sage handbook of performance studies* (2006), 278–295.
- [120] Mady Schutzman. 2006. JOK (ER) ING Joker Runs Wild. In *A Boal Companion*. Routledge, 143–155.
- [121] Mady Schutzman. 2018. *Radical Doubt: The Joker System, After Boal*. Routledge.
- [122] Thomas B. Sheridan. 1992. Musings on Telepresence and Virtual Presence. *Presence: Teleoperators and Virtual Environments* 1, 1 (Jan. 1992), 120–126. <https://doi.org/10.1162/pres.1992.1.1.120>

- [123] T. B. Sheridan. 1995. Teleoperation, Telerobotics and Telepresence: A Progress Report. *Control Engineering Practice* 3, 2 (Feb. 1995), 205–214. [https://doi.org/10.1016/0967-0661\(94\)00078-U](https://doi.org/10.1016/0967-0661(94)00078-U)
- [124] Nurit Shnabel and Arie Nadler. 2008. A Needs-Based Model of Reconciliation: Satisfying the Differential Emotional Needs of Victim and Perpetrator as a Key to Promoting Reconciliation. *Journal of Personality and Social Psychology* 94, 1 (2008), 116–132. <https://doi.org/10.1037/0022-3514.94.1.116>
- [125] Russell Spears, Tom Postmes, Martin Lea, and Anka Wolbert. 2002. When Are Net Effects Gross Products? Communication. *Journal of Social Issues* 58, 1 (2002), 91–107.
- [126] Oliver Stickel, Dominik Hornung, Konstantin Aal, Markus Rohde, and Volker Wulf. 2015. 3D Printing with Marginalized Children—An Exploration in a Palestinian Refugee Camp. In *ECSCW 2015: Proceedings of the 14th European Conference on Computer Supported Cooperative Work, 19-23 September 2015, Oslo, Norway*, Nina Boulus-Rødje, Gunnar Ellingsen, Tone Bratteteig, Margunn Aanestad, and Pernille Bjørn (Eds.). Springer International Publishing, Cham, 83–102. [https://doi.org/10.1007/978-3-319-20499-4\\_5](https://doi.org/10.1007/978-3-319-20499-4_5)
- [127] Brett Stoll, Samantha Reig, Lucy He, Ian Kaplan, Malte F. Jung, and Susan R. Fussell. 2018. Wait, Can You Move the Robot? Examining Telepresence Robot Use in Collaborative Teams. In *Proceedings of the 2018 ACM/IEEE International Conference on Human-Robot Interaction (HRI '18)*. Association for Computing Machinery, New York, NY, USA, 14–22. <https://doi.org/10.1145/3171221.3171243>
- [128] C.J. Stutterheim. 1981. The Feeding Behaviour of the Redbilled Oxpecker. *South African Journal of Zoology* 16, 4 (Jan. 1981), 267–269. <https://doi.org/10.1080/02541858.1981.11447767>
- [129] Tomohito Takubo, Kazutoshi Nishii, Kenji Inoue, and Tatsuo Arai. 2007. Wholebody Tele-Operation for Humanoid Robot by Marionette System. *Journal of the Robotics Society of Japan* 25, 3 (2007), 457–465.
- [130] Robyn Taylor, Guy Schofield, John Shearer, Jayne Wallace, Peter Wright, Pierre Boulanger, and Patrick Olivier. 2011. Designing from within: Humanaquarium. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '11)*. Association for Computing Machinery, New York, NY, USA, 1855–1864. <https://doi.org/10.1145/1978942.1979211>
- [131] Jakob Tholander, Chiara Rossitto, Asreen Rostami, Yoshio Ishiguro, Takashi Miyaki, and Jun Rekimoto. 2021. Design in Action: Unpacking the Artists' Role in Performance-Led Research. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–13. <https://doi.org/10.1145/3411764.3445056>
- [132] James Trevelyan, William R. Hamel, and Sung-Chul Kang. 2016. Robotics in Hazardous Applications. In *Springer Handbook of Robotics*, Bruno Siciliano and Oussama Khatib (Eds.). Springer International Publishing, Cham, 1521–1548. [https://doi.org/10.1007/978-3-319-32552-1\\_58](https://doi.org/10.1007/978-3-319-32552-1_58)
- [133] Katherine M. Tsui, Munjal Desai, Holly A. Yanco, and Chris Uhlik. 2011. Exploring Use Cases for Telepresence Robots. In *Proceedings of the 6th International Conference on Human-Robot Interaction (HRI '11)*. Association for Computing Machinery, New York, NY, USA, 11–18. <https://doi.org/10.1145/1957656.1957664>
- [134] Leena Ventä-Olkkonen, Netta Iivari, Sumita Sharma, Nina Juustila-Cevirel, Tonja Molin-Juustila, Essi Kinnunen, Jenni Holappa, and Heidi Hartikainen. 2022. All the World Is Our Stage: Empowering Children to Tackle Bullying through Theatre of the Oppressed in Critical Design and Making. In *Nordic Human-Computer Interaction Conference (NordiCHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–15. <https://doi.org/10.1145/3546155.3546705>
- [135] Loris Vezzali, Miles Hewstone, Dora Capozza, Dino Giovannini, and Ralf Wölfer. 2014. Improving Intergroup Relations with Extended and Vicarious Forms of Indirect Contact. *European Review of Social Psychology* 25, 1 (Jan. 2014), 314–389. <https://doi.org/10.1080/10463283.2014.982948>
- [136] John Vines, Tess Denman-Cleaver, Paul Dunphy, Peter Wright, and Patrick Olivier. 2014. Experience Design Theatre: Exploring the Role of Live Theatre in Scaffolding Design Dialogues. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 683–692. <https://doi.org/10.1145/2556288.2556960>
- [137] Rojin Vishkaie. 2018. Women, Gender Equality, and Digital Technology. In *HCI International 2018 – Posters' Extended Abstracts (Communications in Computer and Information Science)*, Constantine Stephanidis (Ed.). Springer International Publishing, Cham, 298–303. [https://doi.org/10.1007/978-3-319-92270-6\\_43](https://doi.org/10.1007/978-3-319-92270-6_43)
- [138] Xu Wenfu, Zheng Yanning, and Pan Erzhen. 2015. Design and Simulation of a Turtle Performing Robot for Robotic Theater. In *2015 34th Chinese Control Conference (CCC)*. IEEE, 6049–6054.
- [139] Fiona A. White, Islam Borinca, Loris Vezzali, Katherine J. Reynolds, Johanna K. Blomster Lyshol, Stefano Verrelli, and Juan M. Falomir-Pichastor. 2021. Beyond Direct Contact: The Theoretical and Societal Relevance of Indirect Contact for Improving Intergroup Relations. *Journal of Social Issues* 77, 1 (2021), 132–153. <https://doi.org/10.1111/josi.12400>
- [140] Fiona A. White, Rachel Maunder, and Stefano Verrelli. 2020. Text-Based E-contact: Harnessing Cooperative Internet Interactions to Bridge the Social and Psychological Divide. *European Review of Social Psychology* 31, 1 (Jan. 2020), 76–119. <https://doi.org/10.1080/10463283.2020.1753459>
- [141] Marzenna Wiśniewska. 2020. On Hybridity in Puppetry. *Performance Research* 25, 4 (May 2020), 56–64. <https://doi.org/10.1080/13528165.2020.1842032>
- [142] Ryuji Yamazaki, Shuichi Nishio, Kohei Ogawa, and Hiroshi Ishiguro. 2012. Teleoperated Android as an Embodied Communication Medium: A Case Study with Demented Elderlies in a Care Facility. In *2012 IEEE RO-MAN: The 21st IEEE International Symposium on*

- Robot and Human Interactive Communication*. IEEE, Paris, France, 1066–1071. <https://doi.org/10.1109/ROMAN.2012.6343890>
- [143] George Yerosis, Konstantin Aal, Thomas von Rekowski, David W. Randall, Markus Rohde, and Volker Wulf. 2015. Computer-Enabled Project Spaces: Connecting with Palestinian Refugees across Camp Boundaries. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*. Association for Computing Machinery, New York, NY, USA, 3749–3758. <https://doi.org/10.1145/2702123.2702283>
- [144] Ji-Dong Yim and Chris D. Shaw. 2011. Design Considerations of Expressive Bidirectional Telepresence Robots. In *Proceedings of the 2011 Annual Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '11*. ACM Press, Vancouver, BC, Canada, 781. <https://doi.org/10.1145/1979742.1979633>
- [145] Rami Zeedan. 2019. *Arab-Palestinian Society in the Israeli Political System: Integration versus Segregation in the Twenty-First Century*. Rowman & Littlefield.

Received 31 January 2024; revised 13 October 2024; accepted 23 January 2025

Just Accepted