

The Co-Creation Space: Supporting Asynchronous Artistic Co-creation Dynamics

ALINA STRINER, Centrum Wiskunde & Informatica, The Netherlands

THOMAS RÖGGLA, Centrum Wiskunde & Informatica, The Netherlands

MIKEL ZORILLA, Vicomtech, Spain

SERGIO CABRERO BARROS, Vicomtech, Spain

STEFANO MASNERI, Vicomtech, Spain

HÉCTOR RIVAS, Vicomtech, Spain

IRENE CALVIS, LICEU Barcelona, Spain

JIE LI, Centrum Wiskunde & Informatica, The Netherlands

PABLO CESAR, Centrum Wiskunde & Informatica, The Netherlands and TU Delft, The Netherlands

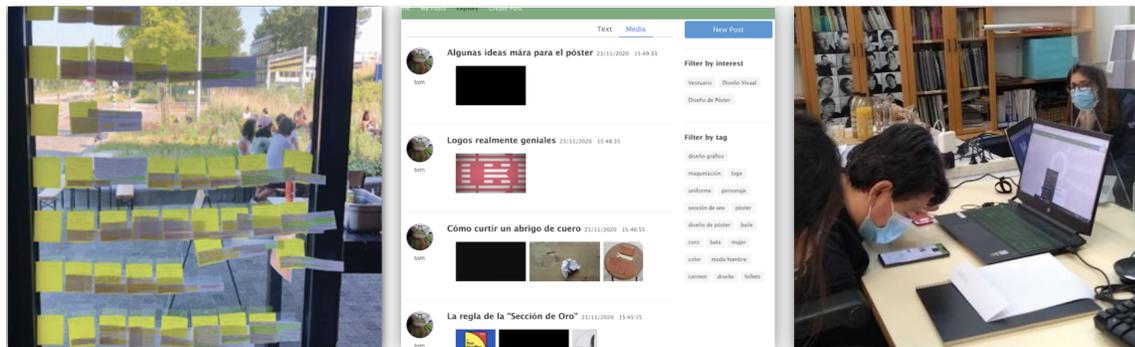


Fig. 1. An overview of our user-centered design process. Left: Photo of our requirement qualitative coding procedure. Middle: Screenshot of the media timeline from the CCS interface. Right: Participant evaluation of the tool in Barcelona.

Artistic co-creation empowers communities to shape their narratives, however HCI research does not support this multifaceted discussion and reflection process. In the context of community opera, we consider how to support co-creation through the design, implementation, and initial evaluation of the Co-Creation Space (CCS) to help community artists 1) generate raw artistic ideas, and 2) discuss and reflect on the shared meaning of those ideas. This work describes our user-centered process to gather requirements and design the tool, and validates its' usability with 6 community opera participants. Our findings support the value of our tool for group discussion and personal reflection during the creative process.

CCS Concepts: • **Human-centered computing** → **Computer supported cooperative work**; **Collaborative content creation**; **Collaborative and social computing systems and tools**.

Additional Key Words and Phrases: Co-creation; Art; Asynchronous

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1 INTRODUCTION

As media creation becomes globally pervasive, artistic co-creation [11, 28] has the capacity to empower communities to shape and share their own narratives [3], thereby fading the distinction between high and low culture [11, 28, 33]. Technology has the potential to support artistic co-creation, however current tools do not adequately support the development of multifaceted artistic, social, and education goals [8, 11] that evolve over time through discussion between professional facilitators and community members. In HCI, participatory design (PD) considers co-creation in favour of concrete goals (e.g. education [6] and tool design [6, 18]), but does not support the dynamics of parallel creative processes, and the evolution of intangible goals [20]. Likewise, media co-creation [2, 26] aims to support artistic co-creation processes by including community members in artistic creation, but does not support iterative community involvement which is vital to artistic co-creation [11]. We design, implement, and test the Co-Creation Space (CCS), to support creative discussion about media in a non-judgemental “safe space” [15]. This tool allows co-creators to 1) put raw ideas into an easily communicable digital formation, and 2) engage in discussion and reflection dynamics.

We situate our work in community opera, working with 3 projects in Ireland, Portugal, and Spain. We employ an user-centered approach to gather requirements and validate the usability and value of our tool through these projects. Based in Dublin, the Irish project (IP) develops a digital opera with remote Irish communities. The second, a Portuguese project (PP) in Leiria, engages prisoners in opera co-creation to lower criminal recidivism. The Spanish project (SP) helps migrant workers in Barcelona learn creative skills through collaboration with professionals at the Liceu opera house. Our contribution lies in understanding and supporting *discussion* around the artistic co-creation process.

2 RELATED WORK

PD practices employ co-creation methods in explicit goals, such as tool creation [16, 34], public deliberation [9], and community management [7]. Such processes engage users at clearly demarcated moments of the co-creation process in explicit roles [16, 23], such as workshop and prototyping phases [9, 23]. In parallel, PD practices in media use workshops, interviews, and high-fidelity prototypes to engage community participants at different steps of the co-creation process [13, 14, 30, 35]. This demonstrates the gap in supporting cooperative work that 1) engages community participants as equals to professionals, and 2) supports the complexity of artistic goals and processes that develop over time. Rossitto [22] characterizes participants, art, and context as interdependent with co-creation technologies, and Varghese [30] questions participatory processes that do not involve community members throughout the creative process. Relatedly, Holmer [14] describes power differences between designers and participants in PD [8], and Clarke [8] recognizes that insight and change comes from working with contradictions in complex community relationships.

There is likewise a gap in supporting discussion and reflection around media creation [11, 26]; Bartindale [2] outlines technology needs for community media collaboration that include peer support, group discussion, and self-reflection. In response to these needs, we develop the CCS to support media discussion and self-reflection dynamics, including *reflection-in-action* that arises during design activities [32], and *reflection-on-action* [24] that helps designers evaluate and reflect on unconscious aspects of their experience [25]. In co-creation, these processes must consider how to represent participant intentions, and support communication differences and contradictory needs [33].

3 GATHERING REQUIREMENTS

We gathered tool requirements with 12 leaders from the project over 3 focus groups. Each session lasted 2.5 hours, and took place over Zoom during May of 2020. Leaders had on average 9.4 years of experience in opera production, and included 4 executive and artistic directors, 2 studio/outreach producers, a digital communications manager, 2 project managers, 2 social program coordinators, and a staging assistant. In preparation, participants filled out a booklet probe, a method of context mapping [29, 31] to elicit feedback about how the projects might use technology for co-creation.

Two moderators led each focus group; one facilitated, while a second took notes. After consent and introductions, participants described their roles and experiences in opera production, and discussed their interpretations of a standard opera timeline. Participants then envisioned how technology could support their co-creation goals, and a moderator summarized related concepts. Finally, participants responded to a high-level artist illustration of tool interaction, discussing how it compared to their co-creation needs. A moderator then summarized participant ideas and tool requirements, and a week after, project leaders were sent the summary to reflect and provide clarifying comments or questions. The focus groups were analysed using thematic analysis, employing a modified version of the six-phase framework developed by Braun and Clarke [4, 5, 19]. Transcribed and cleaned audio-recordings of the sessions were independently open-coded by the moderators for key words and emergent trends, grouped, labeled, and given a description. Through iterative discussion, open codes were grouped to generate high-level themes and sub-themes.

3.1 User Experience Themes and Design Requirements

Theme 1: Support Divergent Elements of Co-creation: Leaders wanted to archive workshop materials, share different phases of co-creation, and needed a space to support education goals and cross-fertilization activities, such as recorded stories by prisoners about their lives. Supporting uncertain timelines was likewise important. Opera usually plans productions years in advance, whereas these projects had to “*be prepared to adapt and change*” (SP).

Theme 2: Building Relationships: Helping participants connect remotely was important for building trust and community relationships. In the prison context, we found that dignified communication created lasting impact; “*we have to know the names of the mothers, of the girlfriends*” for inmates to “*be immersed and cooperative*” (PP).

Theme 3: Technology Flexibility: Community participants had limited technology access, and relied on mobile experiences rather than expensive computers. In complement to this, participants required an interface with minimal learning, and access to content in a variety of languages, as well as the ability to subtitle and translate text.

Theme 4: High-Quality Audio: Leaders wanted to maximize audio quality to feel the physical sensation of the singers; “*opera...lives from the quality of the timber...and most...tools compress...the harmonics*” (PP). Capturing the spatial movement of sound “*relative to where the performers are on the stage*” (IP) was likewise important for immersion.

Design Requirements: Table 1 summarizes functional and non-functional design requirements, including system constraints, and data and usability needs. These are split into 1) Interface, 2) Media, 3) Accessibility, and 4) Summary.

4 DESIGN AND FUNCTIONALITY

We designed our tool through a multi-step user journey [17]. First, we developed *user personas* [1] and defined a set of scenarios and use cases with project leaders and developers. Using a persona template, we brainstormed an initial set of personas, gave project leaders the templates to further brainstorm, and met a second time to discuss their personas. We likewise defined *scenarios* and *use cases*, first integrating personas into a set of scenarios, then brainstorming a set of possible use-cases for how the CCS could support project goals. After receiving feedback on the use cases and adding

Table 1. Requirements Gathered for the Co-Creation Space

Code Type	Requirements
Interface	<i>Simple/intuitive interface; onboarding, Standardized tags; Feedback (commenting and tagging); Password protected user profiles; Edit profile settings after onboarding; Content moderation; Privacy settings; Mobile/Desktop Support</i>
Media	<i>Playback support for HD audio and video; Adaptable video quality for device/bandwidth context; Image previews; Transcode video files into CCS video format; Upload and store standard image and video files and 360° videos; 360° video player; Store, upload, and visualize 3D models; Timestamped media reactions; Screencast support.</i>
Accessibility	<i>Caption overlays for videos; Subtitles/descriptions (edit offline, download, upload); W3C Compliance; Multi language translation; Offline interface that syncs with online database; Admin permissions</i>
Summary	<i>Public-facing co-creation summary timeline; Post notifications; Post thread timeline; Daily digest; Calendar schedule.</i>

corresponding requirements, we *storyboarded* a subset of these interactions, sketching use cases by hand and in Figma (<http://figma.com/>), and discussing these again with project leaders and developers. Finally, we created *wireframes* of the interface based on the storyboard interactions, received feedback from developers on the implementation of the tool, and feedback from project leaders on the clarity of the interfaces. Our implementation met the gathered requirements with the exception of a 360° video player, 3D model visualization, screen-cast support, daily digest, and calendar; during design, feedback from opera leaders suggested these needs were out of scope as their internal plans had changed.

The CCS was developed from our requirements and iterative design process. Functionality includes *creating an account, exploring posts, creating posts* with different types of media, and *commenting and reacting* to posts and media with text and emojis. First, users sign into or create an account, select interest topics, and choose a preferred interface language. Users can explore posts using a text and media preview timeline, filtering for interests and tags, or searching for keywords and phrases. When creating posts, users add a title and description, choose a relevant topic from a drop-down menu, and add tags. When viewing posts, users can select from 70 languages to subtitle videos, and can react to posts through likes and comments. Users can also react to videos with emojis that appear on an emoji timeline below the video. A detailed description of the tool functionality and accompanying screenshots are found in Roggla [21].

5 VALIDATION OF INTERFACE USABILITY

We evaluated the the tool with 6 participants from the Spanish project in December 2020, including 4 students from Escola Massana, and 2 SINEA creatives. The study was conducted in Spanish, and took between 1 and 2 hours to complete. To evaluate both mobile and laptop usability, the first 3 tasks were conducted on a phone, and the last two tasks were conducted on a laptop. After consent, participants were introduced to the tool through a scenario where they were told to imagine they were working with a team member on a poster for the opera. Using a “think aloud” protocol [10], users tested the interface of the tool through 5 tasks, including creating an account, interacting with the media timeline, and commenting on a video with emojis and text. All participants completed the tasks, and at the end of the study, answered open-ended questions that compared the tool to other social media platforms, envisioned its usefulness for co-creation processes, and considered what media editing features they would want to include.

Overall, participants described the CCS as “*well thought-out tool*” (P6); “*fast, easy to use*” (P5) and “*simple...[because] it [focuses] on the co-creation process*” (P6). As well as helping to “*share ideas, or to stay up-to-date with other people’s work,*” they saw it as an archival “*black box’...when people do not agree on something, they can just go back to the post and see what they decided back in the day*” (P1). Compared to existing platforms, the CCS felt like a “*mixture of Google Drive and a chat,*” (P6) but was simpler (P5), and positioned “*text and multimedia...at the same level*” (P6). Users also felt the

tool's emoji and comment reaction features were more intuitive than “*platforms like Slack, Twitter, and Reddit*” (P4), and enjoyed reacting to videos with emojis as a helpful way to highlight a reaction to something specific (P3, P4).

Interface suggestions included different ways of searching for content, accounting for privacy concerns, and visual design changes. These included having a greater awareness of others users of the tool; “*Who has access to the platform?*” P6 asked. “*All the users or just the people from MY group?*” Participants also wanted more direct communication capabilities, such as a private chat feature and video calls (P43), and gave feedback to improve the interface through a different color palette (P1), larger images with less text (P4), and different labels for tagging features (P3, P4, P6).

6 DISCUSSION

We support artistic co-creation through the design, implementation, and evaluation of the *Co-creation Space* (CCS) to help community artists generate raw artistic ideas, and discuss and reflect on the shared meaning of those ideas in a multi-lingual “safe space.” By developing relationships with 3 opera projects, we discovered the complexity of rethinking a traditional art form in context of new technology [27], while working with communities speaking different languages with varying technology needs. Our experience reflects the literature on artistic co-creation; is precisely through (not despite!) this complexity that leads to democratic participation described by Matarasso and others [3, 8, 11]. We gathered requirements with 12 leaders from 3 community opera projects, designed the tool through a user-centered approach, then evaluated the interface with 6 community participants. Our work is primarily limited by its context in opera, and by the size and context of the pilot evaluation, which did not evaluate the complex relationships and power dynamics inherent to artistic co-creation [8, 14]. Future work will validate our findings through open pilots in different performing art contexts and community production processes, as described by Green and others [2, 12, 13].

Social and Temporal Affordances: Participants were motivated by the social affordances of the tool, connection to another during co-creation, and asynchronous feedback on their work. During the design process, we recognised that the tool may be used for mentorship (e.g. a costume expert explaining a sewing technique) as well as for collaborative co-creation processes (e.g. inmates posting audios can be integrated into a composition). By systematically documenting and archiving ideas, discussions, and choices, participants were able to see “*the different steps of the creative process*” (P1) and follow “*the evolution of the work*” (P4), allowing them to recall *when and why* they made creative choices. As well as validating the participant process, this archival process may also allow for the assembly of new experiences [30].

Supporting Reflection and Discussion: As the CCS focused on simplicity, a challenge was determining what features were central to reflection and discussion dynamics. When discussing media editing, some participants wanted image and processing features such as trimming photos, cutting video length, and adding titles to a video. Others opposed processing features “*as there are already other platforms and tools dedicated to editing images*” (P4). Similarly, some participants wanted scheduling and digest features, but existing tools likewise support these processes. Since artistic reflection and discussion dynamics exist within larger media creation processes, an added challenge was understanding how the core value of our tool fits within the symbiotic dynamics of creative app “ecosystems” described by Nouwens [20].

7 CONCLUSION

We created the CCS to support collaboration during artistic co-creation. We gathered requirements for, designed, and implemented the tool using an user-centered process, and validated the tool with 6 community opera participants, finding that they valued the tool as a safe space to share raw ideas, discuss and receive feedback, and reflect on their work. In contrast to explicitly defined PD practices, the CCS supports the *complexity* of community co-creation processes, giving community participants equal status to professionals, and supporting dynamically evolving co-creation goals.

REFERENCES

- [1] Nick Babich. 2020. A beginner's guide to user JOURNEY MAPPING. <https://uxplanet.org/a-beginners-guide-to-user-journey-mapping-bd914f4c517c>
- [2] Tom Bartindale, Guy Schofield, Clara Crivellaro, and Peter Wright. 2016. TryFilm: Situated Support for Interactive Media Productions. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (San Francisco, California, USA) (CSCW '16). Association for Computing Machinery, New York, NY, USA, 1412–1422. <https://doi.org/10.1145/2818048.2819929>
- [3] Augusto Boal. 2000. *Theater of the Oppressed*. Pluto Press.
- [4] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative research in psychology* 3, 2 (2006), 77–101.
- [5] Virginia Braun and Victoria Clarke. 2012. Thematic analysis. (2012).
- [6] Mirian Calvo and Madeleine Sclater. 2021. Creating Spaces for Collaboration in Community Co-design. *International Journal of Art & Design Education* 40, 1 (2021), 232–250.
- [7] Andrea Capaccioli, Giacomo Poderi, Mela Bettega, and Vincenzo D'Andrea. 2016. Participatory infrastructuring of community energy. In *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops-Volume 2*. 9–12.
- [8] Rachel Clarke, Jo Briggs, Ann Light, and Pete Wright. 2016. Situated encounters with socially engaged art in community-based design. In *Proceedings of the 2016 ACM conference on designing interactive systems*. 521–532.
- [9] C DiSalvo, A Clement, and V Pipek. 2012. Communities: Participatory Design For, With, and By Communities, to appear in Robertson, T and Simonsen, J.(eds) *International Handbook of Participatory Design*.
- [10] Marsha E Fonteyn, Benjamin Kuipers, and Susan J Grobe. 1993. A description of think aloud method and protocol analysis. *Qualitative health research* 3, 4 (1993), 430–441.
- [11] Matarasso Francois. 2019. *Restless art: how participation won, and why it matters*. Calouste Gulbenkian Foundation, UK Branch.
- [12] David Philip Green, Simon J. Bowen, Christopher Newell, Guy Schofield, Tom Bartindale, Clara Crivellaro, Alia Sheikh, Peter Wright, and Patrick Olivier. 2015. *Beyond Participatory Production: Digitally Supporting Grassroots Documentary*. Association for Computing Machinery, New York, NY, USA, 3157–3166. <https://doi.org/10.1145/2702123.2702203>
- [13] Christopher Hoadley, Sameer Honwad, and Kenneth Tamminga. 2010. Technology-Supported Cross Cultural Collaborative Learning in the Developing World. In *Proceedings of the 3rd International Conference on Intercultural Collaboration* (Copenhagen, Denmark) (ICIC '10). Association for Computing Machinery, New York, NY, USA, 131–140. <https://doi.org/10.1145/1841853.1841873>
- [14] Hrönn Brynjarsdóttir Holmer, Carl DiSalvo, Phoebe Sengers, and Thomas Lodato. 2015. Constructing and constraining participation in participatory arts and HCI. *International Journal of Human-Computer Studies* 74 (2015), 107–123.
- [15] Mary Ann Hunter. 2008. Cultivating the art of safe space. *Research in Drama Education: The Journal of Applied Theatre and Performance* 13, 1 (2008), 5–21. <https://doi.org/10.1080/13569780701825195>
- [16] Hilary Hutchinson, Wendy Mackay, Bo Westerlund, Benjamin B Bederson, Allison Druin, Catherine Plaisant, Michel Beaudouin-Lafon, Stéphane Conversy, Helen Evans, Heiko Hansen, et al. 2003. Technology probes: inspiring design for and with families. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 17–24.
- [17] World Leaders in Research-Based User Experience. [n.d.]. When and How to Create Customer Journey Maps. <https://www.nngroup.com/articles/customer-journey-mapping/>
- [18] Helena Karasti, Andrea Botero, Elena Parmiggiani, Karen Baker, Sanna Marttila, Joanna Saad-Sulonen, and Hanne Cecilie Geirbo. 2018. Infrastructuring in PD: what does infrastructuring look like? when does it look like that?. In *Proceedings of the 15th Participatory Design Conference: Short Papers, Situated Actions, Workshops and Tutorial-Volume 2*. 1–3.
- [19] Moira Maguire and Brid Delahunt. 2017. Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education* 9, 3 (2017).
- [20] Midas Nouwens, Carla F Griggio, and Wendy E Mackay. 2017. "WhatsApp is for family; Messenger is for friends" Communication Places in App Ecosystems. In *Proceedings of the 2017 CHI conference on human factors in computing systems*. 727–735.
- [21] Thomas Röggl, Alina Striner, Héctor Rivas Pagador, and Pablo Cesar. 2022. The Co-Creation Space: An Online Safe Space for Community Opera Creation. In *ACM International Conference on Interactive Media Experiences*. 229–232.
- [22] Chiara Rossitto. 2021. Political ecologies of participation: Reflecting on the long-term impact of civic projects. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–27.
- [23] Joanna Saad-Sulonen, Eva Eriksson, Kim Halskov, Helena Karasti, and John Vines. 2018. Unfolding participation over time: temporal lenses in participatory design. *CoDesign* 14, 1 (2018), 4–16.
- [24] Donald A. Schön. 1984. *The Reflective Practitioner: How Professionals Think In Action*. Basic Books.
- [25] Phoebe Sengers, Kirsten Boehner, Shay David, and Joseph 'Jofish' Kaye. 2005. Reflective Design. In *Proceedings of the 4th Decennial Conference on Critical Computing: Between Sense and Sensibility* (Aarhus, Denmark) (CC '05). ACM, New York, NY, USA, 49–58. <https://doi.org/10.1145/1094562.1094569>
- [26] Moushumi Sharmin and Brian P. Bailey. 2013. ReflectionSpace: An Interactive Visualization Tool for Supporting Reflection-on-Action in Design. In *Proceedings of the 9th ACM Conference on Creativity & Cognition* (Sydney, Australia) (C&C '13). Association for Computing Machinery, New York, NY, USA, 83–92. <https://doi.org/10.1145/2466627.2466645>

- [27] Alina Striner, Sarah Halpin, Thomas Röggl, and Pablo Cesar. 2021. Towards Immersive and Social Audience Experience in Remote VR Opera. In *ACM International Conference on Interactive Media Experiences*. 311–318.
- [28] Steven J. Tepper and Bill Ivey. 2012. *Engaging Art: The next great transformation of America's cultural life*. Taylor and Francis. <https://doi.org/10.4324/9780203927502>
- [29] Fenne van Doorn, Pieter Jan Stappers, and Mathieu Gielen. 2013. *Design Research by Proxy: Using Children as Researchers to Gain Contextual Knowledge about User Experience*. Association for Computing Machinery, New York, NY, USA, 2883–2892. <https://doi.org/10.1145/2470654.2481399>
- [30] Delvin Varghese, Patrick Olivier, Tom Bartindale, and Matt Baillie Smith. 2020. Towards participatory video 2.0. In *Proceedings of the 2020 CHI conference on human factors in computing systems*. 1–13.
- [31] Froukje Sleeswijk Visser, Pieter Jan Stappers, Remko van der Lugt, and Elizabeth B-N Sanders. 2005. Contextmapping: experiences from practice. *CoDesign* 1, 2 (2005), 119–149. <https://doi.org/10.1080/15710880500135987>
- [32] Andrew M. Webb, Rhema Linder, Andruid Kerne, Nic Lupfer, Yin Qu, Bryant Poffenberger, and Colton Revia. 2013. Promoting Reflection and Interpretation in Education: Curating Rich Bookmarks as Information Composition. In *Proceedings of the 9th ACM Conference on Creativity & Cognition* (Sydney, Australia) (*C&C '13*). Association for Computing Machinery, New York, NY, USA, 53–62. <https://doi.org/10.1145/2466627.2466636>
- [33] Cara Wilson, Roisin McNaney, Abi Roper, Tara Capel, Laura Scheepmaker, Margot Brereton, Stephanie Wilson, David Philip Green, and Jayne Wallace. 2020. Rethinking Notions of 'Giving Voice' in Design. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–8.
- [34] Volker Wulf, Claudia Müller, Volkmar Pipek, David Randall, Markus Rohde, and Gunnar Stevens. 2015. Practice-based computing: Empirically grounded conceptualizations derived from design case studies. In *Designing socially embedded technologies in the real-world*. Springer, 111–150.
- [35] Pinar Yelmi and Tulu Bayar. 2020. Designing an Interactive Non-Linear Documentary Contributed by Public Participation: Suburbs of Istanbul. In *Proceedings of the 2020 ACM Designing Interactive Systems Conference*. 747–755.