FinHERtip: Embodied Identity and Human-AI Co-Creation in Accessible Musical Performance

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Figure 1: *FinHERtip* — Performed in Summer 2025.

Abstract

FinHERtip introduces a musical performance system co-designed with a blind, queer musician to explore identity expression music creation. The system combines beadwork, computer vision, and audio synthesis to translate tactile gestures into layered, expressive sound. Drawing from both blind and queer cultural practices, it centers embodied authorship and reclaims technical space through personal ritual and material interaction. An **Expressive Co-Creation Framework** is proposed to support collaborations between human experience and machine response. This work advances accessible digital performance by challenging normative design and valuing lived identity as a site of creative agency.

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CCS Concepts

• **Applied computing → Sound and music computing**; • **Human-centered computing → Empirical studies in interaction design**; *Accessibility*.

Keywords

Tangible musical interface, Music performance, Queer identity, Human-AI collaboration, Accessibility

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1 Introduction

This paper presents a live musical performance that explores the performative possibilities for blind and low vision (BLV) performers through a co-design pipeline of musical performance design. The performance collaborates with an indie BLV musician, Cai (pseudonym), a lesbian performer from a rural region in southern China. We developed a tangible musical interface, *FinHERtip*, that engages bodily engagement, algorithmic agency, and queer identity, bringing together beadwork, computer vision, and Human-AI co-creation.

Beadwork, shown in Figure 2, is a widely used tangible material in education for BLV people, valued for its tactile perception, flexibility and low cost [Zhang et al. 2024]. In *FinHERtip*, beadwork becomes both an input medium and a form of identity expression, transforming the performer's gestures into algorithmically generated soundscapes. Drawing from Cai's practice of beadwork and Guzheng playing for emotional relief and musical expression, we embedded these embodied rituals into the performance.

Our work builds on tangible computing, soma design, and queer embodiment and identity, which collectively challenge the dominant, masculinized logics of digital technology. Technical systems are often framed by masculine-coded authority, requiring conformity to abstract standards of competence that marginalize queer, feminine, and disability [Brooke 2025]. *FinHERtip* claims technical space through embodied interaction, playful materiality, and human-AI co-creation. The performance uses beadwork and gesture recognition to produce expressive sound. The performer's hand becomes a site of queer and disabled agency. This somatic experience highlights social identity, accessibility and co-creation, reclaiming technical space for marginalized forms of expression.

We frame this work as practice-based research [Candy and Edmonds 2018]. Through iterative co-design with Cai, we developed a tangible musical interface that facilitated both technical and artistic exploration. The resulting system maps bead configurations to multi-layered audio sequences, integrating Guzheng and bass elements central to Cai's expression. Additionally, we proposes a paradigm, **Expressive Co-Creation Framework**, as follows: 1) Identifying the relationship between embodiment and the target identity (expression); 2) Bridging tangible computing to expression; 3) Empowering embodied expression by co-creating with AI. This paradigm redefines how BLV queer performers break through the constraints of mainstream technical authority to express queer identity, and how we conceptualize autonomy and authorship in digital performance.

This paper contributes to two key areas:

- The design and technical realization of *FinHERtip*, a tangible musical interface for BLV and queer expression;
- The **Expressive Co-creation Framework**, which supports broader applications of AI co-create, identity expression performance design.

2 Related Work

2.1 Queer Embodiment and Identity

In social sciences and psychology, queer embodiment is a key way in which identity is experienced, expressed, and negotiated through the body. Charlotte Ross proposes "queer embodiment" as combining phenomenological attention to lived experience and materiality [Ross 2012]. Queer identity is shaped through how people live in their bodies, in relation to others and to social norms. Identities like butch and femme are not fixed roles, but ways of expressing sexuality and responding to pressures such as patriarchy and heteronormativity [Crawley and Willman 2018]. Research in psychology also shows that sexuality is understanding through people's bodies over time and in different settings [Tolman et al. 2014]. Thus, the existing research underlines why embodiment matters - it's how identity is felt and lived, not just theorized.

Within HCI, scholars have explored how tangible interactions can materialize queer identity [DeVito et al. 2021; Riggs et al. 2024]. Projects like "Button Portraits" demonstrate how wearable/tactile objects can evoke queer affect and communal belonging [Riggs et al. 2024]. Additionally, Freeman proposes that the body embodiment is highly related to queer identoty [Freeman and Acena 2022]. Overall, aligning embodiment with queer identity reveals how sexuality and selfhood are lived through the body. This alignment is important across different domains, where embodied practices contribute to queer experiences, making identity both expressive and socially situated.

2.2 Tangible Computing for BLV People

We position our work within ongoing research on tangible computing and soma design. Tangible interfaces have been introduced to support BLV individuals in music learning, creation, and performance, using a range of everyday and custom-made objects such as Rubik's cubes [Mannone et al. 2019], mobility canes [Dimogerontakis et al. 2024], 3D-printed blocks with NFC or QR codes [Costa et al. 2022; Kobayashi and Matsumoto 2022; Sabuncuoglu 2020], and AR-tagged cards recognized via computer vision [Omori and Yairi 2013; Yairi and Takeda 2012]. These systems enable users to manipulate musical elements such as notes, tempo, loudness, and timbre through physical interaction.

In recent years, soma design has emerged as an approach to designing technology centered on bodily experience [Höök et al. 2016]. It emphasizes subtle and rhythmic interactions that foster bodily awareness, particularly in feminist HCI, and is especially relevant for BLV individuals, as tactile perception plays a key role in their daily life activities [Höök et al. 2019; Luft et al. 2023; Ståhl et al. 2016; Zhang et al. 2024]. Overall, these works demostarte potential of using tactile and familiar materials to support non-visual and embodied interaction, providing foundations for designing accessible musical interfaces that align with the sensory strengths and bodily practices of BLV people.

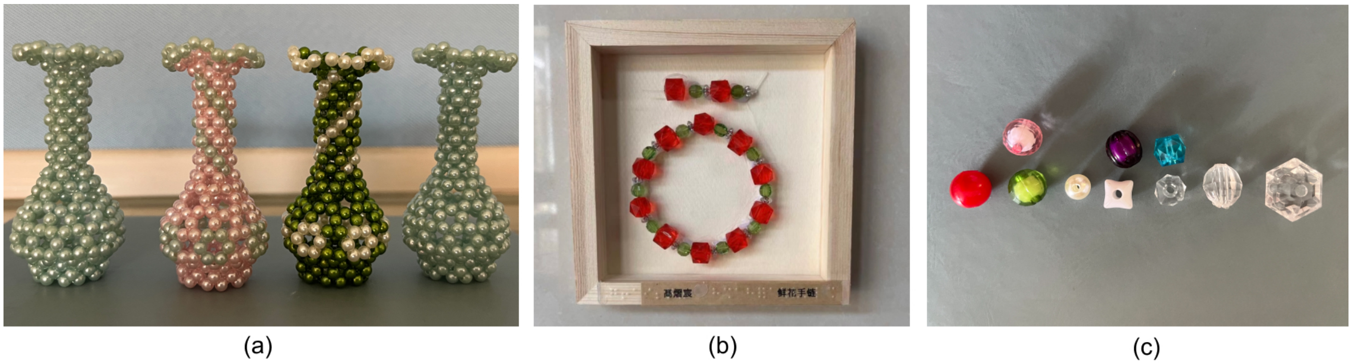

Figure 2: The photoes of beadwork, originally published in Zhang et al. From (a) to (c) shows the complicated beadwork (3D) to single bead. Reproduction permission was obtained by the authors.

2.3 AI and Tangible Computing in Artworks and Performance

Recent developments in somatic music and AI collaboration mark a shift from using AI as an assistive tool to engaging it in embodied, co-creative performance. Many performances and installations draw on soma design, incorporating bodily input and tangible materials. For example, seeds and Khipu have been adapted into musical interfaces rooted in daily tactile practices [Cadavid 2020; Hinojosa 2022]. Bang and Fdili Alaoui designed an interface combining bodily movement and material interaction [Bang and Fdili Alaoui 2023]. Lia Mice's work with oversized digital instruments reveals how scale alters technique and identity, showing how technology co-constructs the body and culture [Mice and McPherson 2022]. Rust uses performance to reflect on women's labor [Rüst 2021], while Vann et al. highlight queer embodiment through emotionally layered sonic participation [Vann et al. 2024].

Artists also increasingly engage AI as a co-creator in sound and visual media. Lee proposes AI musical agents paired with real-time projections [Lee et al. 2025], and Fan presents a live performance blending Chinese percussion with AI improvisers [Fan 2021]. Together, these works demonstrate the growing potential of embodied, accessible, and queer-aligned human-AI performance.

3 Artistic Concepts and Ideas

In this section, we demonstrate the co-design procedure and the conceptual framework of the artistic concepts and ideas, showing how our design aligns with related works.

3.1 Co-Design with BLV Performer

In the co-design session, we articulate the contribution of each step and how the BLV performer collaborates with the researcher. We co-design with the BLV performer and her assistant, conducting six co-design workshops over two months (Figure 3). Each workshop targets a different topic: 1) Self-reflection on performer; 2) Co-designing a tangible musical interface; 3) Trying out the developed tangible musical interface and designing the mapping of music to each tangible component in the performance; 4) Trying out the first iteration; 5) Co-designing the performance; 6) Technical rehearsal.

Figure 3: (a) is a photo shot in the co-design session. (b) shows the first small musical performance.

3.2 Conceptual Framework

From the co-design sessions, we draw on three points from the related work 2 to structure the conceptual framework of artistic concepts and ideas.

3.2.1 *Hands as queer expression.*

Cai reflects inward to express her identity through performance. As a queer person, she faces challenges around inclusion and belonging [Crawley and Willman 2018; Ross 2012]. Research in Queer HCI shows how small gestures can affirm identity, resistance, and community [DeVito et al. 2021; Freeman and Acena 2022; Riggs et al. 2024]. In response, Cai performs beadwork and sound gestures with her fingertips, embedding her lesbian identity into the interface. The hand becomes not just a tool but a site of agency. Cai's finger gestures in beadwork support musical expression while asserting queer and disabled agency.

3.2.2 *Beadwork as accessible interface.*

Beadwork grounds the interface in tactile input [Zhang et al. 2024]. In our first meeting, Cai shared her perfromance's motivations and reflected on daily life as a BLV and queer person. Beadwork and Guzheng are her stress-relief activities for 12 years. Thus, sound elements draw from her Guzheng practice, a habit that deepens her musical exploration. In co-design, Cai and the researchers make an agreement that the bass and drum are core to supporting her performance.

3.2.3 Human-AI co-creation in performance. In our co-design, we consider that AI are not engaged as tools but co-creators. AI responds to both beadwork and gestures, enabling shared authorship. Agency is reframed as co-agency, expressing intent through human–machine systems [Bennett et al. 2023]. For a blind queer performer, autonomy emerges through interdependence—with tools, materials, and audience [Bergström et al. 2022]. *FinHERtip* presents a somatic, AI-integrated performance that foregrounds accessibility, agency, and creative partnership.

4 Technical Realization

FinHERtip maps physical configurations of tangible objects (beads) into generative musical loops in real-time. The full system consists of five loosely coupled subsystems: 1) a tangible user interface; 2) a visual capture unit; 3) a perception engine; 4) an audio generation core; 5) and sound delivery.

As illustrated in Figure 4, users place strung beads with different shapes on a platform. User triggers sensing via a hand gesture. A camera captures the scene, and the perception engine encodes bead positions into symbolic track sequences. These sequences are interpreted by three audio engines, which synthesize synchronized audio layers—rhythm, bass, and melody. sound card renders in real-time and the speaker play the music.

4.1 Tangible Interface

Our system centers around a bead-based tangible interface that translates physical arrangements into symbolic musical material. The interface consists of a flat platform onto which users place plastic beads of various geometric shapes (e.g., circles, squares, triangles). These beads serve as embodied musical primitives whose interpretation depends on both their shape and spatial context.

Beads are not arranged linearly, but rather in closed circular patterns (referred to as rings) on the platform. Each ring is interpreted as an individual track, or musical voice. Within a ring, beads are read in a clockwise or left-to-right traversal order to form a discrete symbolic sequence—analogous to a musical phrase or seed.

Each bead shape does not have a fixed absolute meaning; rather, its musical role is context-dependent, modulated by which track it appears in. For instance, a triangle in Track 1 may denote a kick drum event, while the same shape in Track 2 could trigger a bass palm muting. This role-overloaded mapping enables a compact yet expressive vocabulary for musical representation.

Through this mechanism, users can sculpt multiple musical streams in parallel—using different rings to lay out rhythm, bass, or melody layers. The arrangement is modular and reconfigurable, allowing for improvisation, composition, and real-time re-seeding by simply moving or replacing beads on the surface.

4.2 Vision Capture

A fixed 1080p USB webcam is mounted directly above the platform, oriented for a vertical top-down view. This setup ensures consistent imaging of the bead arrangement, minimizing distortion and maintaining spatial alignment between physical and virtual representations.

Users initiate a capture by raising both hands above the platform in a distinctive gesture—open palms facing downward, referred to here as a double palm-down trigger. This gesture is detected via MediaPipe[Lugaresi et al. 2019], a lightweight skeletal tracking model that runs in real time on standard CPU hardware.

Once the gesture is recognized, the system introduces a 0.5-second delay before capturing the image. It ensures the user's hands are out of frame, avoiding occlusion and producing a clean top-down view of the bead configuration. The resulting image—termed the bead pattern—is forwarded to the Perception Engine for symbolic analysis.

4.3 Perception Engine

Figure 5 shows how the Perception Engine transforms the captured bead image into three symbolic sequences, each corresponding to a distinct musical layer.

Bead Detection. We fine-tuned a YOLOv8-nano[Jocher et al. 2023] model on a dataset of 200 annotated images, each containing up to three concentric bead rings. The dataset spans five bead classes, each denoting a distinct musical role. The final model achieves a mAP@50 of 0.938 and per-class F1 scores above 0.90, demonstrating robust detection performance. We adapt YOLOv8 for its real-time efficiency and compact design. The nano variant runs on limited hardware while detecting small, closely spaced beads with high accuracy. Its single-stage pipeline also simplifies training and deployment, matching the needs of our interactive system.

Symbol Assembly. From the predicted bounding boxes, we compute the center point of each detected bead. A density-based clustering algorithm then groups these centers into spatial clusters, each corresponding to a physical ring placed by the user. Typically, three clusters are identified, arranged from left to right on the platform.

Track Encoding. Within each cluster, beads are ordered by their angular position in polar coordinates, using the cluster centroid as the origin. This yields a consistent clockwise sequence for each ring, invariant to spatial rotation. “Track” refers to a symbolic musical sequence—a series of discrete symbols representing rhythmic or melodic patterns. In our system, each track is derived from a ring of beads. As illustrated in Figure 5, the rings correspond to Track 1 (T1), Track 2 (T2), and Track 3 (T3), arranged from right to left. Bead classes are mapped to symbols, producing sequences such as:

- Track 1: T1#A–T1#B–T1#A–T1#D–T1#E …
- Track 2: T2#C–T2#A–T2#A–T2#B–T2#B …
- Track 3: T3#B–T3#B–T3#E–T3#E–T3#A …

4.4 Audio Generation Core

The audio generation core transforms symbolic bead sequences into a three-layer musical composition. Each layer corresponds to a specific musical role: rhythm, bass and melody, reflecting modular principles common in electronic music production[Zeiner-Henriksen 2016]. To facilitate flexibility and stylistic variation, each track is handled by an independent synthesis engine, as shown in Table 1.

Each symbolic sequence from Perception Engine is interpreted as a control stream. These streams collectively form a 4-bar musical loop, aligned to a user-defined BPM. The sequences are processed by the following dedicated engines:

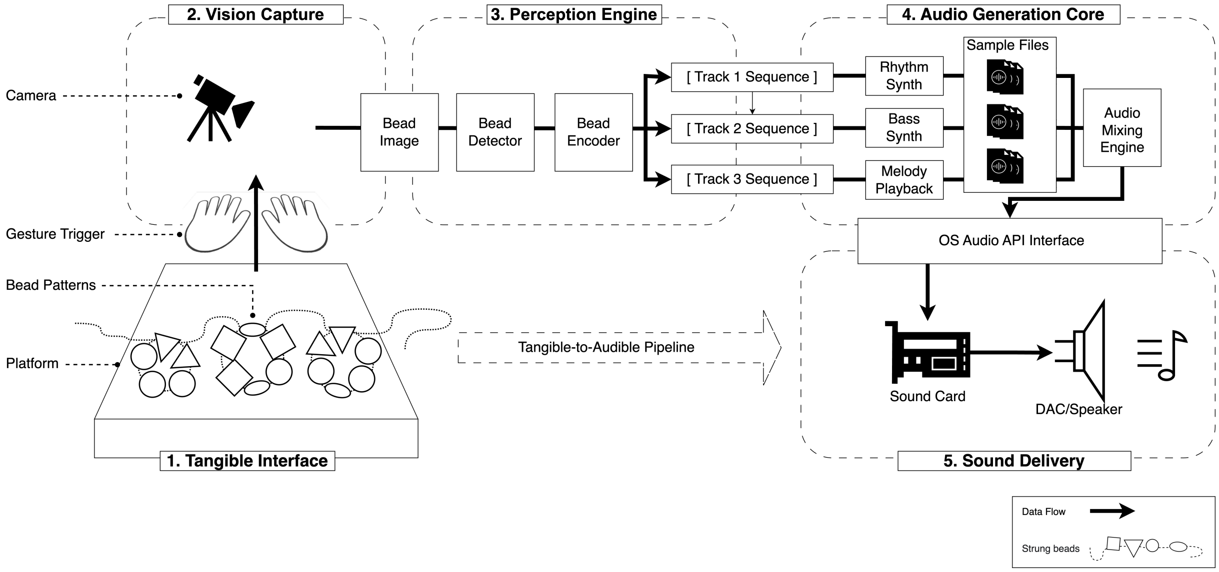

Figure 4: The Tangible-to-Audible pipeline of *FinHERtip*. (1) Users string beads on a platform to create bead patterns. (2) Hand gestures trigger a camera to capture these bead patterns, and the Vision Capture module return bead images. (3) The Perception Engine then detects and encodes the strung bead patterns into track sequences. (4) These sequences are translated into rhythm, bass, and melody through the Audio Generation Core, which uses synthesizers and sample files. (5) The generated audio is delivered via the OS audio interface, sound card, and speaker system.

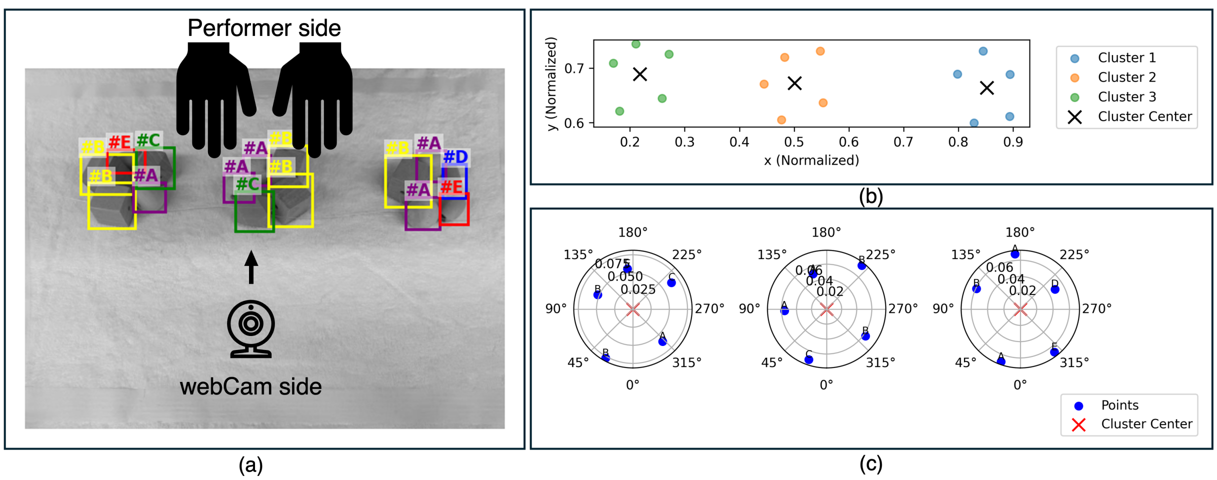

Figure 5: Visualization of the symbolic sequencing pipeline in the *Perception Engine*. (a): Input image captured by the webcam, with beads detected and labeled using our fine-tuned YOLOv8-nano model. Colored bounding boxes denote the five bead classes (e.g., #A, #B, etc.), overlaid on up to three physical rings placed by the user. (b): Cartesian view of the computed centers for each detected bead, normalized to $[0, 1]$, with color-coded clustering. Cluster centers are marked with black crosses, arranged from right to left in order. (c): For each cluster, beads are sorted by their angular position (θ) in polar coordinates, measured clockwise from the downward (south) direction. Cluster centroids serve as polar origins. This ordering yields rotation-invariant sequences used to generate symbolic musical tracks.

Rhythm Synth: A character-level LSTM trained on curated drum pattern sequences. It accepts a seed and generates 8-symbol loops using top-k sampling. The vocabulary encodes kick, snare, and other timbres. See Algorithm 1.

Bass Synth: A greedy decoder LSTM that models note-to-note progression. Each symbol maps to a bass sample (e.g., one-shot '.wav'), sequenced in rhythm-aligned steps. See Algorithm 2.

Table 1: Track–Ring Mapping and Corresponding Synthesis Engines

Track (Ring ID)	Musical Role	Engine	Output Type
T1 (Rightmost ring)	Rhythm	DrumRNN (LSTM)	Symbolic → Sample-based
T2 (Middle ring)	Bass	BassNet (LSTM)	Symbolic → Sample-based
T3 (Leftmost ring)	Melody	MelodyNet (Hybrid)	Symbolic → Audio (glitch / stretch)

Algorithm 1: DrumRNN (Autoregressive Drum Generator)

Input: Seed string s, loop length L
Output: Sequence S of L symbols
$S \leftarrow s$;
while $|S| < L$ **do**
  $x \leftarrow \text{Embed}(S)$;
  $h \leftarrow \text{LSTM}(x)$;
  $p \leftarrow \text{Softmax}(Wh)$;
  $c \leftarrow \text{SampleTopK}(p)$;
  Append c to S;
return S

Algorithm 2: BassNet (Conditioned Bass Generator)

Input: Rhythm string R
Output: Bass string B
$B \leftarrow [R_0]$, $h \leftarrow$ init;
for $i \leftarrow 1$ **to** $|R|$ **do**
  $x \leftarrow \text{Embed}(B_{i-1})$;
  $o, h \leftarrow \text{LSTM}(x, h)$;
  $B_i \leftarrow \arg\max(\text{Softmax}(Wo))$;
return B

Melody Synth: A hybrid playback engine that maps symbolic inputs to sampled melody phrases (e.g. Guzheng Clips). For certain input keys, these audio clips undergo micro-grain segmentation (e.g., 100ms chunks) and randomized reordering (glitch processing). This yields a fragmented, textured playback that evokes techno and experimental electronic styles. For others, the system performs classic time-stretching to maintain melodic continuity. See Algorithm 3.

All tracks are synchronized via a global metronome. The loop duration is computed as:$T_{\text{loop}} = \frac{60}{\text{BPM}} \times 4$ bars

Runtime Details. All models are executed in real time on a CPU-only system. Model files are <1MB, and playback is handled via `simpleaudio`. Melody phrases are time-stretched using `librosa` to ensure loop alignment.

4.5 Sound Delivery

The synthesized tracks are routed through a unified audio mixing engine that merges rhythm, bass, and melody layers. Sample files are loaded via simpleaudio, a lightweight Python wrapper, and played through the operating system's native audio interface (CoreAudio on macOS).

Algorithm 3: MelodyNet (Sample-Based + glitch-based micro-granular reconstruction)

Input: Symbol string $G = [g_1, ..., g_n]$, target length T
Output: Concatenated audio
$\Phi \leftarrow []$;
foreach g_i *in* G **do**
  $clip \leftarrow \text{LookupSample}(g_i)$;
  if $g_i \in GlitchKeys$ **then**
    $grains \leftarrow \text{Split}(clip, \text{grain\_size} = 100\text{ms})$;
    $\text{Shuffle}(grains)$;
    $clip' \leftarrow \text{Concatenate}(grains)$;
  else
    $clip' \leftarrow \text{TimeStretch}(clip, T)$;
  Append $clip'$ to Φ;
return $\text{Mix}(\Phi)$

All audio is buffered and sent to the system sound card as PCM signals, which are then converted via DAC and delivered through external speakers. Playback is synchronized via a master metronome and supports live updating of sequences during looping.

5 Live Performance

The live music performance holds twice in two different pavilion at a suburban farm in the summer of 2025, see Firgure 6 and 1. Each pavilion is about 40 square meters for containing over 40 people. This is an open call performance welcome not only queer and people who are blind and low vision.

The implementation includes a tangible musical interface placed on a table covered with white cloth for visual contrast. The system uses:

- A 1080p60 webcam mounted overhead;
- A Focusrite Scarlett 2i2 sound card;
- A set of JBL PartyBox/Genelec 8030C speaker for music playing;
- An Apple M1 laptop for processing and synthesis.
- A Yamaha MG10XU mixer.

Figure 6 illustrates the layout of the physical installation.

To define the auditory character of each musical layer in this performnace, we selects parts of Cai's Guzheng practice audio clips and open-source audio samples tailored to the intended texture and affective quality. For rhythm, we employ a collection of classic TR-808 drum machine samples from the Fischer pack[Fischer 2017]. The bass layer uses sine-rich samples from Cleary's FL-style minimal bass library[Cleary 2020]. For melodic, the guzheng layer applies from Cai's Guzheng daily practice.

Figure 6: (a) shows the setup, including a tangible musical interface placed on a table covered with white cloth for visual contrast. The system consists of a 1080p60 webcam mounted overhead, a Focusrite Scarlett 2i2 sound card, a set of JBL PartyBox or Genelec speakers for audio playback, an Apple M1 laptop for processing and synthesis, and a Yamaha mixer. (b) shows the completed beadwork after one of the concerts. (c1) to (c4) are screenshots from the overhead camera recording during a live performance. In (c1), the performance begins; in (c2), a hand gesture triggers the camera to read the shapes and patterns of the beads and play the corresponding musical layer. (c3) and (c4) show the beadwork and system output at the peak and conclusion of the performance, respectively.

The *FinHERtip* performance lasts approximately six minutes. Cai begins with a simple beadwork piece, followed by two more with corresponding bass and Guzheng sounds. She then removes the initial beadwork and continues adding new ones. The performance concludes with a final simple beadwork triggering drum sounds. These beadwork-musical mappings is shown in Figure 6.

6 Expressive Co-design Framework

Based on the articulation in Related Work (Section 2) and Conceptual Framework (Section 3.2), we propose a paradigm, **Expressive Co-design Framework**, for technology-integrated interactive art and performance. The **Expressive Co-design Framework** describes a mode of interactive performance design that centers bodily experience, tangible materials, and shared authorship between human and machine. Developed through co-design with a blind, queer performer, this framework highlights how identity, accessibility, and AI can be meaningfully integrated in tech-art. Here, we articulate the **Expressive Co-design Framework** in three points and how it has been particularly applied to *FinHERtip*.

(1) **Identifying the relationship between embodiment and the target identity (expression).** Building on research in queer embodiment, identity is enacted and negotiated through bodily gestures, often in resistance to normative structures [Crawley and Willman 2018; Riggs et al. 2024; Ross 2012; Tolman et al. 2014]. Thus, the hand becomes a central expressive medium, where Cai's finger gestures in beadwork produce sound as well as assert queer and disabled agency. The hand, in this paradigm, is not a passive interface but a site of identity-making. As demonstrated in Queer HCI and performance studies, small-scale bodily interactions can be politically and emotionally charged, reaffirming identity through touch, rhythm, and motion [DeVito et al. 2021; Freeman and Acena 2022].

(2) **Bridging tangible computing to expression.** Tangible computing enabling non-visual interaction for BLV people through physical manipulation of sound parameters. The *FinHERtip* is constitutive of the aesthetic and conceptual design, shaped through co-design with the performer herself. The design extends the use of beadwork, making it a tactile, expressive queer identity, and personally meaningful material. Beadwork facilitates a poetic interface, reflecting lived experience of stress-relief, care, and musical exploration.

(3) **Empowering embodied expression by co-creating with AI.** This paradigm positions AI as a co-creative agent, responsive to embodied input and improvisational structure, rather than framing it as a tool or background system. In human-AI performance, agency becomes distributed. For Cai, autonomy is relational: shaped through shared authorship with AI, beadwork, sound, and space [Bennett et al. 2023; Bergström et al. 2022]. This approach affirms that disabled and queer

performers perform within a mesh of technological, material, and human interdependencies.

The **Expressive Co-creation Framework** bridges theory and practice by grounding artistic expression and tangible interface design in lived experiences. Through this paradigm, *FinHERtip* demonstrates how interactive artworks can be grounded in the expression of lived experience while expanding the aesthetic and technical boundaries of performance [Höök et al. 2019, 2016; Luft et al. 2023; Ståhl et al. 2016]. Future work can follow the **Expressive Co-creation Framework** and the technical approaches, exploring a different expressive topic.

7 Conclusion

FinHERtip explores how a blind queer performer co-authors a digital music performance through embodied interaction, beadwork, and AI. Rather than adapting to mainstream tools, the performer shapes a system grounded in personal, cultural, and sensory experience. This work reframes technical expertise through the lens of care, tactility, and identity. Beadwork becomes both interface and expression, challenging norms of what counts as legitimate performance or skill in digital art. Through the Expressive Co-Creation Framework, we propose a model for designing accessible, identity-centered, and relational performances. Agency here is not individual mastery but co-agency—emerging through interaction with materials, machines, and audience. *FinHERtip* demonstrates that inclusion in creative technology is not about fitting in, but transforming the space itself. It invites broader visions of who gets to perform, how, and with what tools.

References

Tove Grimstad Bang and Sarah Fdili Alaoui. 2023. Suspended Circles: Soma Designing a Musical Instrument. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–15.

Dan Bennett, Oussama Metatla, Anne Roudaut, and Elisa D Mekler. 2023. How does HCI understand human agency and autonomy?. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–18.

Joanna Bergström, Jarrod Knibbe, Henning Pohl, and Kasper Hornbæk. 2022. Sense of agency and user experience: Is there a link? *ACM Transactions on Computer-Human Interaction (TOCHI)* 29, 4 (2022), 1–22.

Siân Brooke. 2025. "Python is for girls!": Masculinity, Femininity, and Queering Inclusion at Hackathons. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. 1–13.

Laddy P Cadavid. 2020. Knotting the memory//Encoding the Khipu_: Reuse of an ancient Andean device as a NIME. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. 495–498.

Linda Candy and Ernest Edmonds. 2018. Practice-based research in the creative arts: Foundations and futures from the front line. *Leonardo* 51, 1 (2018), 63–69.

Ryan Cleary. 2020. FL Studio Bass Samples. https://github.com/cleary/samples-flbass.

Rui Costa, Alvaro Costa Neto, Cristiana Araújo, and Pedro Rangel Henriques. 2022. A framework to assess melodic effectiveness in training computational thinking to visually impaired people. In *2022 International Symposium on Computers in Education (SIIE)*. IEEE, 1–6.

Sara L Crawley and Rebecca K Willman. 2018. Heteronormativity made me lesbian: Femme, butch and the production of sexual embodiment projects. *Sexualities* 21, 1-2 (2018), 156–173.

Michael Ann DeVito, Caitlin Lustig, Ellen Simpson, Kimberley Allison, Tee Chuanromanee, Katta Spiel, Amy Ko, Jennifer Rode, Brianna Dym, Michael Muller, et al. 2021. Queer in hci: strengthening the community of lgbtqia+ researchers and research. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–3.

Emmanouil Dimogerontakis, Dan Overholt, and Stefania Serafin. 2024. MusiCane: an Accessible Digital Instrument inspired by the white cane. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. International Conference on New Interfaces for Musical Expression.

Hongshuo Fan. 2021. Metamorphosis. In *NIME 2021*. https://nime.pubpub.org/pub/kjjp3zcs.

Alex Fischer. 2017. TidalCycles TR-808 Sample Pack. https://github.com/tidalcycles/sounds-tr808-fischer.

Guo Freeman and Dane Acena. 2022. " Acting Out" Queer Identity: The Embodied Visibility in Social Virtual Reality. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–32.

Laddy Patricia Cadavid Hinojosa. 2022. Kanchay_Yupana: Tangible rhythm sequencer inspired by ancestral Andean technologies. In *NIME 2022*. PubPub.

Kristina Höök, Sara Eriksson, Marie Louise Juul Søndergaard, Marianela Ciolfi Felice, Nadia Campo Woytuk, Ozgun Kilic Afsar, Vasiliki Tsaknaki, and Anna Ståhl. 2019. Soma design and politics of the body. In *Proceedings of the Halfway to the Future Symposium 2019*. 1–8.

Kristina Höök, Martin P Jonsson, Anna Ståhl, and Johanna Mercurio. 2016. Somaesthetic appreciation design. In *Proceedings of the 2016 chi conference on human factors in computing systems*. 3131–3142.

Glenn Jocher, Jing Qiu, and Ayush Chaurasia. 2023. *Ultralytics YOLO.* https://github.com/ultralytics/ultralytics

Nahoko Kobayashi and Mitsuharu Matsumoto. 2022. Music learning support system using blocks. In *2022 12th International Congress on Advanced Applied Informatics (IIAI-AAI)*. IEEE, 164–169.

Keon Ju M Lee, Philippe Pasquier, and Jun Yuri. 2025. Revival: Collaborative Artistic Creation through Human-AI Interactions in Musical Creativity. *arXiv preprint arXiv:2503.15498* (2025).

Yoav Luft, Pavel Karpashevich, and Kristina Höök. 2023. Boards Hit Back: Reflecting on Martial Arts Practices Through Soma Design. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–18.

Camillo Lugaresi, Jiuqiang Tang, Hadon Nash, Chris McClanahan, Esha Uboweja, Michael Hays, Fan Zhang, Chuo-Ling Chang, Ming Guang Yong, Juhyun Lee, Wan-Teh Chang, Wei Hua, Manfred Georg, and Matthias Grundmann. 2019. MediaPipe: A Framework for Building Perception Pipelines. *CoRR* abs/1906.08172 (2019). arXiv:1906.08172 http://arxiv.org/abs/1906.08172

Maria Mannone, Eri Kitamura, Jiawei Huang, Ryo Sugawara, Pascal Chiu, and Yoshifumi Kitamura. 2019. CubeHarmonic: a new musical instrument based on Rubik's cube with embedded motion sensor. In *ACM SIGGRAPH 2019 Posters*. 1–2.

Lia Mice and Andrew P McPherson. 2022. Super size me: Interface size, identity and embodiment in digital musical instrument design. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. 1–15.

Shotaro Omori and Ikuko Eguchi Yairi. 2013. Collaborative music application for visually impaired people with tangible objects on table. In *Proceedings of the 15th International ACM SIGACCESS Conference on Computers and Accessibility*. 1–2.

Alexandra Teixeira Riggs, Sylvia Janicki, Noura Howell, and Anne Sullivan. 2024. Designing an archive of feelings: Queering tangible interaction with button portraits. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*. 1–17.

Charlotte Ross. 2012. Queer Embodiments:: fluidity, materiality, stickiness. In *Queer Crossings:: Theories, Bodies, Texts*. Mimesis International, 19–36.

Annina Rüst. 2021. Bad Mother/Good Mother: The Poetics and Politics of the Sounds of Invisible Labor. *Proceedings of the ACM on Computer Graphics and Interactive Techniques* 4, 2 (2021), 1–9.

Alpay Sabuncuoglu. 2020. Tangible music programming blocks for visually impaired children. In *Proceedings of the fourteenth international conference on tangible, embedded, and embodied interaction*. 423–429.

Anna Ståhl, Martin Jonsson, Johanna Mercurio, Anna Karlsson, Kristina Höök, and Eva-Carin Banka Johnson. 2016. The soma mat and breathing light. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*. 305–308.

Deborah L Tolman, Christin P Bowman, and Breanne Fahs. 2014. Sexuality and embodiment. (2014).

Brook Vann, J Molina-Garcia, and August Black. 2024. Pulse Memorial: A web broadcasted multichannel sound installation exploring queer grief through audience participation. In *SIGGRAPH Asia 2024 Art Papers*. 1–6.

Ikuko Eguchi Yairi and Takuya Takeda. 2012. A music application for visually impaired people using daily goods and stationeries on the table. In *Proceedings of the 14th international ACM SIGACCESS conference on Computers and accessibility*. 271–272.

Hans T Zeiner-Henriksen. 2016. Moved by the groove: Bass drum sounds and body movements in electronic dance music. In *Musical rhythm in the age of digital reproduction*. Routledge, 121–140.

Shumeng Zhang, Weiyue Lin, Zisu Li, Ruiqi Jiang, Chen Liang, Mingming Fan, and Raul Masu. 2024. Beadwork Bridge: Understanding and Exploring the Opportunities of Beadwork in Enriching School Education for Blind and Low Vision (BLV) People. In *Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility*. 1–14.