# *Where Do I Go?*: A Game-Based Exploration of Failure and Playfulness as Musical Expression

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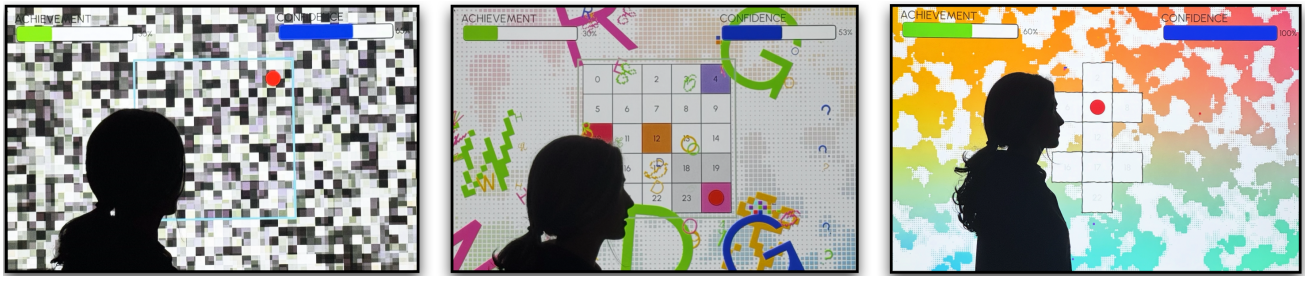


**Figure 1: A three-panel snapshot shows the player moving through glitch-tile puzzles in Level 2 and a hopscotch pattern in Level 3, with Achievement and Confidence meters tracking progress.**

## Abstract

This paper introduces *Where Do I Go?*, an interactive NIME practice that utilizes the Impostor Phenomenon (IP) as a conceptual framework to investigate failure and playfulness in music performance. The project integrates game mechanics, glitch aesthetics, and audience participation within a grid-based game structure, enabling audience members to direct the performer's movements and choices in real time. The paper first outlines the conceptual motivations for the interface and examines the relationship between the Impostor Phenomenon and performance practice. It then situates the work within related research and artistic traditions, demonstrating how using game design and glitches can turn mistakes into creativity. The technical implementation is described, including game design, scoring mechanics, hardware configuration, software pipeline, and the adaptive sound engine. The discussion addresses the artistic implications of this approach, acknowledges current limitations, and proposes future directions for expanding the performance framework. This work seeks to encourage broader dialogue about vulnerability, creativity, and community-building within NIME and related fields.

## Keywords

musical interface, game, failure and playfulness, impostor phenomenon, interactive musical performance

## 1 Introduction

Impostor Phenomenon (IP), defined as the persistent sense of fraudulence despite clear evidence of competence, affects numerous high-achieving individuals, particularly within creative and academic domains [26]. Individuals experiencing IP frequently report a lack of belonging, concerns that their accomplishments are unearned [13], and apprehension that others will eventually recognize their perceived inadequacy. This phenomenon occurs regardless of achievement level, gender, or professional field [26].

*Where Do I Go?* externalizes the internal experience of IP by constructing a performance system in which achievement metrics actively undermine the performer's sense of self-worth. Game design serves as the primary medium for this investigation, as it inherently involves negotiation of rules, uncertainty, and shifting definitions of success. During the performance, the performer engages with a grid-based game on stage, with actions determined through a dynamic interaction between audience input and personal decision-making.

This format highlights the influence of external factors and the experience of uncertainty. It also emphasizes the creative potential inherent in system glitches, treating each as both a challenge and a source of expressive possibility. The work encourages reflection on the conditions under which error becomes opportunity. Glitches are intentionally incorporated as moments that allow the performer to transcend the game's constraints, thereby transforming system failure into a form of achievement. This methodology draws on experimental music and post-digital art, where failure is recognized as a catalyst for creativity [8, 25].

In this paper, we examine both the conceptual foundations and technical realization of *Where Do I Go?*, paying particular attention to the dramaturgical and musical roles that glitches play as expressive tools [3]. The following section discusses how this game-based mode of engagement offers novel forms of collaboration and community participation.

### 1.1 Participation as Transformative Act

Creative collaborations and meaningful social dialogue grow when NIME projects welcome artists, makers, and academics beyond the established community. However, the technical complexity of our field often creates a barrier to entry. This work addresses this by making NIME a bridge between specialized technical work and wider social experiences. We embed complex technical systems within meaningful artistic frameworks. In doing so, technology becomes the bridge linking concept, making, and audience engagement.


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Central to this work is the concept of participation as a transformative act. Drawing on Augusto Boal's "Theater of the Oppressed",audience members become "spect-actors", actively collaborating in the development of the performance [4]. This process extends beyond passive observation, encouraging participants to question the performer's choices and their own.

This methodology also draws on the traditions of Fluxus [20] and performance art [1], in which distinctions between artist, audience, and environment are intentionally blurred. This provides a useful model for translating complex technical systems into accessible performances.

The IP is a widely shared experience, and engagement with this theme does not require a background in NIME research. Its effects extend across geographic and disciplinary boundaries, frequently manifesting as anxiety, perfectionism, and reduced self-confidence. Recent research indicates that social support from outside one's immediate peer group is essential for mitigating impostor feelings, while support within competitive peer environments may intensify them [15]. Our performance opens up conversation and reflection with anyone who has confronted self-doubt or questions of belonging. Performance art is positioned here as a space for dialogue, agency, and the building of community among NIME performers and audiences, as well as within the broader context of NIME's evolving practices.

To contextualize this work within broader artistic and scholarly discourse, the following section provides related research and practices that have shaped its conceptual foundations and methodological approach.

## 2 Related Work

*Where Do I Go?* integrates interactive performance, the aesthetics of failure, and subversive game design. By making the internal tension of impostor phenomenon visible, this work extends the tradition of using interactive systems to reflect complex psychological states. The musical interface serves as a space for social and personal reflection, challenging the traditional focus on flawless performance by highlighting the performer's vulnerability [9] instead of flawless execution. This approach is rooted in our game-based framework.

The incorporation of playful, game-like features into musical interfaces blurs the distinction between performers and audiences, encouraging broader participation in the creative process. NIME researchers often use this approach to break down these boundaries [6, 11, 19]. Our work builds on these ideas but shifts the focus from traditional expertise to exploring failure, self-doubt, and playfulness. Such engagement often grows when game mechanics encourage play and prompt players to subvert standard goals or rethink what it means to win.

Several games have influenced the scoring logic of this project, particularly through their use of self-referential feedback. Rather than focusing solely on points and levels, these games encourage players to experiment with unconventional strategies [14, 18]. This approach redirects attention from straightforward achievement to creative thinking within and beyond the game environment. For instance, Michael Brough's 868-HACK [7] links self-belief to gameplay by requiring players to assess their own skill when choosing the number of enemies to confront. Similarly, Max Kreminski's Epitaph [21] employs a chain of dependencies in which failure increases the likelihood of subsequent failures, illustrating how negative events can accumulate over time.

Our work adapts the snowballing effect by increasing impostor bias in proportion to the player's confidence when glitches are missed, mirroring the escalation of self-doubt that occurs when individuals dwell on their failures. This persistent cycle of doubt is examined through failure and unpredictability, which serve as tools for artistic discovery in NIME practices [9]. Rather than avoiding mistakes, artists increasingly regard malfunctions and errors as sources of new material and as mechanisms for altering perceptions among performers and audiences.

Works that embrace failure highlight vulnerability and the creative opportunities it presents, expanding the expressive potential of musical systems [16]. In this project, these mechanical changes manifest visually and sonically as glitches [22], positioning the game's breakdown as a central stylistic element. Drawing on Cascone's "post-digital" aesthetics [8], glitches in Where Do I Go? are interpreted as "failure is a feature, not a bug", providing novel avenues for musical expression and system critique [18].

Video game design demonstrates that glitches can function as both obstacles and opportunities. For instance, in Metal Gear Solid (1998), the boss Psycho Mantis requires players to alter the physical configuration of their controller to succeed. The game also includes moments such as the on-screen display changing from "VIDEO" to "HIDEO" during a simulated glitch. After employing these techniques, the player overcomes Psycho Mantis. Such fourth wall-breaking moments have inspired elements of this project, in which the performer must relinquish standard rules to regain control [27].

Similar to circuit bending [24] and glitch art movements [24], this project treats malfunction as a creative pathway [5]. The following sections provide a detailed account of the game design, scoring system, and technical implementation that support this framework.

## 3 Where do I go?

*Where Do I Go?* is a performative exploration of the Impostor Phenomenon (IP) that translates feelings of self-doubt, failure, and playfulness in performance art into a participatory musical game. The piece unfolds across three progressive levels on a 5x5 grid, each stage representing a distinct psychological mode: external guidance, confusion and resistance, and self-acceptance through play. The interplay of audience instructions, performer agency, and system glitches forms the core narrative, questioning conventional notions of success and achievement. As the game goes on, achievements build up and confidence shifts in unexpected ways. The piece encourages both the performer and the audience to work through rules, uncertainty, and disruptions together. Immediately before the piece begins, the performer announces a short orientation to the house in addition to providing program notes.

### 3.1 Program Notes

*Where Do I Go?* is a performative exploration of the Impostor Phenomenon (IP), translating self-doubt, failure, and playfulness in performance art into a participatory musical game. At the start, the performer asks, "Where do I go?" Audience members respond by calling out a cell number (0–24) on the 5×5 grid, and the performer navigates accordingly. If you notice a an active glitch on the grid, you can call it out by naming the cell; a glitch is caught when the performer steps onto that cell while the glitch is active. If the performer does not step onto an active glitch cell before it deactivates, the glitch is missed. As the game progresses, the

| Levels | Performane Action | Audience Role | Game Metric and glitches |
|---|---|---|---|
| Level 1: External Guidance & Self-Doubt | Follows audience directions exactly | Direct performer's movement | Two glitch tiles are introduced. Landing on a glitch increases achievement but lowers confidence. Each time the player leaves the grid, confidence increases. |
| Level 2: Confusion & Resistance | Responds less reliably and questions audience | Attempts to direct and faces resistance | Four glitch tiles are introduced. Catching a glitch increases achievement. Confidence can increase or decrease. Each time the player leaves the grid, confidence increases. |
| Level 3: Play & Self Acceptance | Inores directions ad moves freely | Observes and no longer directs | The glitch tiles disappear, and the 5×5 grid turns into a hopscotch game. Reaching the end hopscotch tile increases achievement and confidence. A play pattern emerges. |

**Figure 2: Table shows three levels of the performance game system, detailing performer actions, audience roles, and game metrics or glitches at each stage.**

performer may start to resist your input or act independently. The boundaries between audience and performer blur, and the rules themselves become just another part of the game to explore. In the final phase, the performer regains full autonomy and moves freely, leaving you to watch and reflect on the shifting balance. *Where Do I Go?* is both an experiment and a negotiation, a dialogue of power and play where every participant decides just how far to go.

## 3.2 Interaction

Interaction dynamics unfold across three levels. Audience input is delivered verbally in the performance space. Audience members call out a target tile by its cell index (0–24) on the 5×5 grid, and the performer uses these shouted instructions to choose where to move. Throughout the game, the performer's score and confidence are monitored and shown, providing clear feedback to everyone involved. Figure 2 summarizes the progression and participant roles for each stage.

*3.2.1 Level 1: External Guidance & Self-Doubt.* The performer begins in the first grid cell and asks, "Where do I go?" to get direction from the audience. In this stage, the performer acts like a human cursor, following the audience's instructions exactly. If the performer steps on a glitch tile, the system creates a visual and sound disruption. The performer leaves the grid and strikes a cymbal to mark the achievement. The achievement score on-screen increases, but the performer's confidence does not necessarily follow. The performer's physical demeanor reflects growing confusion, illustrating how external success can deepen internal self-doubt.

*3.2.2 Level 2: Confusion & Resistance.* In the second stage, the system becomes more unstable, with glitches occurring more frequently, making performance harder. The performer's tone changes, and their requests for feedback sound more uncertain and frustrated. Audience instructions start to lose their effect as the performer begins to ignore or question them, showing a growing inner struggle. Achievements are harder to define, and the confidence meter on-screen fluctuates.

*3.2.3 Level 3: Play & Self-Acceptance.* In the final level, the strict 5x5 grid disappears, replaced by a hopscotch pattern. This change marks a move from structured work to free play. The performer stops interacting with the audience and leaves behind the "Where do I go?" question. The performer moves freely, their silence signaling a shift from external validation to internal autonomy. By reclaiming the space through the logic of a playground game rather than a rigid grid, the performer illustrates how playfulness can serve as a vehicle for navigating complex psychological barriers [2]. This climactic transformation creates a provocative environment where the audience is left to reflect on their own roles in structures of authority and validation [10].

## 3.3 Game Design and Scoring

The central game mechanic subverts the traditional "mastery loop" in game design, where achievement typically yields reward and status [23]. The game design draws on Pauline Clance's The Impostor Cycle [12], which begins when an achievement-related task is assigned and is characterized by a disconnect between achievement and self-perception. This cycle explains how individuals experience anxiety when facing tasks, achieve success, but ultimately attribute accomplishments to external factors, leading to persistent self-doubt [26]. In translating this psychological phenomenon into a performative context, the game deliberately decouples achievement from confidence.

The scoring system evaluates two key metrics: Achievement and Confidence. Achievement is measured through event-based success updates. In Levels 1 and 2, these updates are primarily tied to catching an active glitch. Confidence is tracked separately and changes through its own rules. The game has three levels and in each level the scoring mechanics are updated through discrete game events. In practice, the score changes when the performer catches an active glitch, misses an active glitch, and leaves the grid.

Achievement and Confidence are coupled differently across levels. In Levels 1 and 2, active glitch tiles are predefined, with fixed locations and fixed glitch themes. During gameplay, each glitch activates at randomized times and remains active for random durations. In both levels, catching an active glitch produces a success update that increases Achievement, symbolizing material success. Missing an active glitch decreases Achievement. Entering an off-grid state increases Confidence, encouraging the player to be playful.

In Level 1, the two metrics are deliberately uncoupled. A success update increases Achievement but decreases Confidence. This establishes the central contradiction: completing the assigned task does not necessarily produce reassurance. In Level 2, a success update still increases Achievement, but Confidence may either increase or decrease after each success. This preserves the disconnect while making the relationship between performance and self-perception less stable. Level 3 uses a different rule set. There are no glitch tiles to catch. Instead, one success condition is reaching Cell 22, the end of the hopscotch path. When the performer reaches this tile, the game registers a success update that increases both Achievement and Confidence. More generally, in Level 3, success updates move the two metrics together, symbolizing that the player now begins to internalize their success as confidence.

Further details regarding technical implementation, including sensor data, system architecture, and the sound engine, are provided in Section 4.

# 4 Technical Implementation

Our system uses a three-part software pipeline to manage data collection, game logic, and the sound engine. We use Python[1] for

[1]https://www.python.org

**Figure 3: Left panel shows the battery and microcontroller with a quarter for size reference. Middle panel shows the battery and microcontroller wrapped into a module. The right panel shows the module embedded into a ball. Here, you can also see the opening that was cut into the ball.**

sensor input and correcting position data, Processing[2] for game logic and visuals, and Max[3] for the adaptive sound engine. As shown in Figure 4, the system operates as a closed-loop feedback mechanism connecting the performer, software, and audience.

In Python, we connect to the wearable foot-tracking sensor via Bluetooth Low Energy (BLE) and perform a brief calibration before the performance. We correct for the natural foot progression angle, as the sensor is worn on the foot. The corrected position data streams into Processing via OSC, where the game discretizes coordinates into tile indices and updates player state and scoring metrics in real time.

Max sends OSC messages to Processing to control level transitions based on the set total duration of the performance. Processing waits for OSC signals indicating that a level has started or ended, then updates the round state and transitions from a short round-title screen to active play. In Processing, the main draw loop discretizes incoming position updates into tile indices, applies round-specific glitches, updates player state, and continuously sends per-cell state back over OSC for the audio engine.

The grid's cells can display randomized colors and overlays based on game state, while the performer's movements directly affect which visual and scoring events occur. Classes manage grid layout, player achievement, and confidence, forming the core game logic and user feedback systems. Glitch effects are integrated to create a responsive, playful environment that reacts to performer input and timing cues. OSC communication keeps Processing synchronized with Python (sensor input) and Max (audio/timing), allowing the system to adapt dynamically to both performer movements and audience input.

## 4.1 Electronics

To track performer location, we use WEAR's Navigation Solutions' RT-BLE-001r3 foot tracking device [4]. This compact, lightweight wireless sensor (30 × 20 × 8 mm, 6 gm) as shown in Figure 3 provides real-time data on foot position and orientation via BLE. With these capabilities, we reliably map movement onto our 5×5 grid game and support broader movement analysis. The RT-BLE-001r3 operates independently, with inertial sensors and an onboard computer. It streams live updates to any nearby BLE-enabled device using a transparent protocol. Key advantages include continuous, stepwise motion tracking with typical step-to-step error below 1%. Horizontal positioning error is under 24%. The device operates at up to 100 Hz and supports dynamic movement up to jogging pace (about 3 m/s). Its battery lasts over 12 hours and recharges in 1.5 hours, allowing for uninterrupted performance. The self-contained design is resilient to interference and adaptable for various environments, from musical performance to clinical gait analysis.

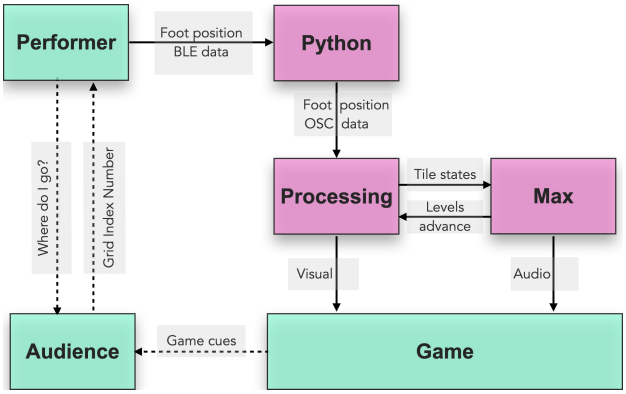


**Figure 4: The diagram shows the data flow in an interactive game-piece system where a performer's movements are tracked and processed by software, influencing the game and involving the audience in real-time decision-making.**

The Python calibration algorithm collects 15 position samples as the user steps forward and back, computes the forward direction angle as $\arctan 2(y_{\max}, x_{\max})$ from the maximum-distance sample, and constructs a z-axis rotation matrix for all subsequent position vectors. This corrects for individual foot progression angle variations, ensuring that forward movement is measured relative to the user's actual walking direction rather than the sensor's orientation.

## 4.2 Sound Engine

The sound engine serves as a compositional system, generating audio in real time based on gameplay and supporting the performance's narrative. It uses adaptive synthesis with multiple interdependent layers. Player movement on the grid activates distinct synthesizer voices, allowing the music to evolve as the performer moves. As achievements increase, sonic textures become richer. Glitch states are intentionally included as expressive events, introducing randomized glitches, bursts of noise,

[2] https://processing.org
[3] https://cycling74.com/products/max
[4] https://www.imuwear.com

and micro-sounds. Each glitch tile either adds a new motif or disrupts the current texture. The engine manages these layers by dynamically adjusting the mix based on the duration of active glitches. When a glitch is triggered, its sound layer becomes more prominent.

The sound engine adapts to gameplay variables and the evolving context of each performance, producing a dynamic soundscape tailored to the game. This approach allows unexpected moments to shape and expand the piece's expressive range. In Level 1, the engine encourages audience interaction by maintaining a sparse musical texture. In Level 2, the 5×5 grid acts as a five-step, five-layer sequencer. As the performer moves, steps are activated or deactivated, resulting in denser music that builds momentum and creates a more continuous texture. In Level 3, the focus shifts to manipulating the pre-recorded "Where do I go?" voice as the main sound material. As the performer becomes less audience-driven, the engine reduces external interaction, highlighting the persistence of impostor thoughts even as achievements accumulate and confidence returns.

Beyond the synthesized layers, the sound design includes two forms of achievement announcement. When a glitch is caught, the system immediately plays a short pre-recorded reversed cymbal. The performer then leaves the grid and strikes a physical cymbal to announce the achievement within the performance space. Exiting the grid is a core game rule: each departure increases confidence. This action represents a metaphorical break from the evaluated task space, aligning with the Impostor Phenomenon framework, where relief and self-assurance depend on interruption, reframing, or externalization rather than in-task performance alone. [12, 26].

The sound engine also uses a pre-recorded vocal part where the performer asks, "Where do I go?" In Level 1, this question is asked live to create a direct connection with the audience. In Levels 2 and 3, the recorded voice plays alongside the live performance, highlighting feelings of uncertainty and outside pressure. By Level 3, the voice slowly fades away, showing the shift from doubt to confidence.

## 5 Discussion and Limitations

As discussed earlier in Section 1.1, this work is inspired by participatory performances [20]. By combining technical complexity with accessible artistic frameworks and encouraging dialogue, Where Do I Go? presents NIME as more than a specialist platform. It becomes an open space for a wide range of communities, including artists, makers, academics, and people from outside the usual circles. This approach builds a culture of shared meaning and creative risk, reflecting Kaprow's idea that true artistic freedom comes from working together and sharing authorship.

Professor Johannes Haushofer's "CV of Failures" [17] influenced this work. This document acts as a 'meta-résumé,' listing professional rejections, unsuccessful applications, and academic setbacks. Still, sharing vulnerability is often easier for those who have already found success. Haushofer's openness is facilitated by his position as a Princeton professor, which provides both the security of tenure and the prestige of the institution.. In contrast, for students or early-career researchers, such openness may be perceived not as a courageous pedagogical approach but rather as an indication of inadequacy. We recognize that not everyone has the same freedom to fail. By comparison, NIME research supports this kind of artistic exploration. It offers a space to start new conversations about artistic risk, failure, and playfulness in performance as musical expression.

Our practical limitation comes from using the wearable foot sensor, which needs quick calibration between levels to track movement accurately. At each transition, the performer returns to the starting grid position and does a short step-back-and-forward routine. This calibration is necessary for technical accuracy, but it is built into the performance and rehearsed so the audience does not notice these brief adjustments.

## 6 Conclusion and Future Work

This project looks at the paradoxes of achievement and self-doubt through interactive performance. It uses game-like engagement, audience participation, and the idea of failure to highlight the Impostor Phenomenon. By separating achievement from confidence, the system shows the complex nature of validation, vulnerability, and playfulness, inviting both performer and audience into a space of uncertainty. This work explores musical expression and encourages new conversations about failure, risk, and play across different fields, audiences, and spaces.

During development, we investigated possibilities for alternative spaces beyond the traditional stage. Using the foot tracker integrated into the game system, the performer is not limited to a fixed position and can be located anywhere. The current configuration employs a cymbal as a stage prompt to announce achievements, with the performer activating the cymbal if the player successfully navigates glitches and leaves the game environment. For future iterations, we aim to adapt the piece for outdoor performances by integrating a carillon in place of the cymbal for achievement announcements. Additionally, we will investigate the use of alternative sound icons and innovative announcement methods to further expand the work's sonic and spatial possibilities. We keep exploring alternative glitch effects and announcement mechanisms, and to use NIME performance as a vehicle for dialogue in academic and non-academic communities.

In addition to performance practice and technical development, we are also developing a score and script for the performance. This will make the work accessible to other NIME participants and performers from diverse backgrounds who want to present the piece, enabling broader interpretations.

Finally, Dr. Özcan's ongoing artistic investigation into playfulness and failure in performance art is reflected in multiple NIME performances, including a piece centered on juggling [9]. In Where Do I Go?, this juggling performance will be incorporated as one of the "glitches," positioning the current work within a broader continuum of performances. This approach allows Dr. Özcan to integrate her NIME practice into the evolving narrative.

## 7 Acknowledgments

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## 8 Ethical Standards

This project is supported by a grant from the Arts Initiative at the University of Michigan. A survey is being conducted to inform

this work and contribute to discussions about achievement, failure, and IP in academic settings. All data collected is anonymized to ensure participant privacy.

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