人間とアルゴリズムの知覚を通じて日常動作を振付として再解釈する「気づかれざるダンス」の予備的研究

A Preliminary Study on Unnoticed Dance: Reinterpreting Everyday Movement as Choreography through Human and Machine Perception

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概要: Unnoticed Dance は、日常的な身体動作を生成的な視覚技術を用いて振付として再構成するプロジェクトである。意図しないジェスチャーに内在する表現性を可視化することで、「ダンス」という概念の再定義を試み、知覚および機械拡張による身体表現に関する新たな研究手法を提案する。

キーワード: 表現支援, インタラクティブシステム, 知覚支援

1. Introduction

Dance is often seen as a formal and intentional practice, yet many recognised dance movements originate from everyday actions reinterpreted through subtle structural cues. When timing, repetition, or visual emphasis is introduced, even ordinary walking can appear choreographed. This study asks under what conditions viewers begin to perceive such non-choreographed movements as expressive dance when mediated by algorithmic intervention.

From a Human–Machine Interaction perspective, dance is treated as a co-constructed perceptual event rather than a purely human-authored form. The study draws on Andy Clark's theory of the *Extended Mind* [1], which frames cognition as distributed across body, tools, and environment, and on the concept of co-embodiment [2], where control and perception are shared between humans and machines. Algorithmic intervention is considered not as a choreographer but as a perceptual collaborator capable of reframing mundane actions to evoke expressivity.

A relevant example is the work of the Cybersubin One Lab [3], which uses real-time motion tracking and machine learning to augment human performance, emphasising co-agency between dancer and system. While their focus is on extending intentional dance vocabulary, *Unnoticed Dance* instead explores perceptual ambiguity, examining how minimal algorithmic manipulation can make non-dance actions appear dance-like and what it means to be seen by a machine as expressive.

This paper investigates these perceptual thresholds through algorithm-edited walking sequences with different levels
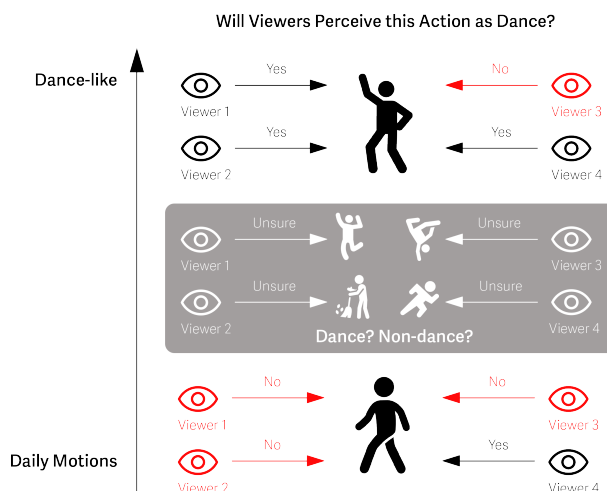

図 1: **Concept of Unnoticed Dance**

of AI-edited duration (20%, 50%, and 80%). Findings from this pilot study suggest that both the duration of expressive segments and distinct dance-like moments influence perception, leading to the hypothesis that algorithmic mediation can reinterpret everyday movement as expressive actions and shift how viewers reflect on their own movement practices.

2. Concept of Unnoticed Dance

Unnoticed Dance is a media art research project that investigates how expressive movement can emerge from mundane action through perceptual framing and machine mediation. Inspired by collectives such as the World Order group [4], whose choreographed walking turns ordi-

nary motion into performance through repetition, timing, and spatial symmetry, this project examines how computational systems might evoke a similar shift in awareness. Drawing on theories of distributed cognition and affective recognition, it treats choreography not as pre-authored intent but as a relational and systemic event co-produced by body, machine, and viewer.

This work is conceived as a pilot exploration of when and how algorithmic manipulation can push ordinary gestures, such as walking, across the perceptual boundary into dance. The pilot study suggests that both the duration of expressive segments and the presence of distinct dance-like moments play key roles: longer AI-edited sequences encouraged viewers to reinterpret the motion as a whole, while short but striking dance-like movements could also trigger perception shifts. By reframing everyday gestures through real-time machine intervention, the project aims to highlight the co-agency between human and system and invite audiences to reflect on what it means to be seen by a machine as expressive.

3. Pilot Observation

3.1 Purpose

This pilot observation examines how algorithmic intervention shifts the perception of everyday movement into dance. It asks: *under what conditions do viewers begin to perceive non-choreographed motion as expressive?* The hypothesis is that increased temporal and spatial transformation creates a perceptual threshold where mundane walking is reinterpreted as dance.
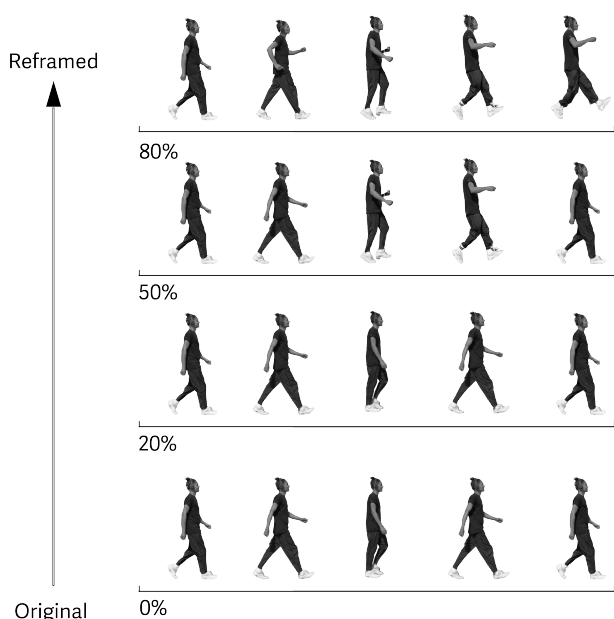

図 2: **Different ratios of AI intervention applied to the walking sequence**

3.2 Method

A single reference walking clip was processed using Morphic AI to create four variations with increasing AI-edited duration, forming a spectrum of algorithmic intervention. The percentage refers to the proportion of AI-edited duration rather than specific techniques. No parameters were strictly controlled; longer AI-edited segments naturally introduced more rhythmic and repeated patterns.

Clip 1 (Baseline, 0%): Raw, unedited walking motion.

Clip 2 (20% AI-edited duration): Mostly walking, with some dance-like movements introduced in the middle.

Clip 3 (50% AI-edited duration): An equal mix of walking and dance-like movements throughout.

Clip 4 (80% AI-edited duration): Mainly dance-like movements, with walking only at the beginning.

3.3 Participants

Eleven participants (4 male, 7 female; aged 20–39) with diverse backgrounds took part in the study. Most had no formal dance training, while two reported beginner-level experience (less than one year). Participants were generally familiar with observing dance through media but varied in how often they engaged with it personally, providing a balanced range of perceptual sensitivities.

3.4 Process

Participants viewed the four clips in randomised order. After each clip, they responded to four questions:

- Did the movement appear to be dance (Yes/No)?

- How expressive did it feel (scale: 0–10)?

- What visual or temporal cues influenced this perception?

- Did your perception change at any point during the clip?

Quantitative data were used to compare dance recognition and expressivity ratings, while qualitative feedback captured descriptions of visual and affective cues.

3.5 Results and Analysis

Quantitative Results:

As shown in Figure 3 and Figure 4, dance recognition increased with higher transformation levels, with 9 of 11 participants identifying the 80% clip as choreographed or performance-like. At 20% and 50% AI-edited durations, responses were mixed: many participants shifted to choosing "Unsure," indicating that by 50% they began to perceive the entire sequence as potentially dance-like, or at least could no longer firmly categorise it as "not dance." Expressivity ratings followed a gradual upward trend, averaging 3.2 (0%), 5.6 (20%), 6.4 (50%), and 7.6
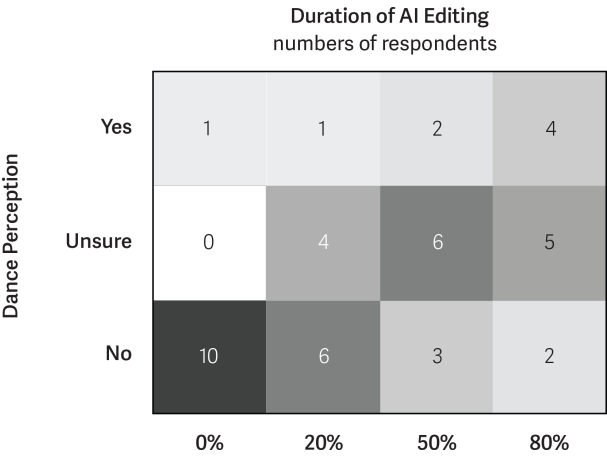
Duration of AI Editing
numbers of respondents

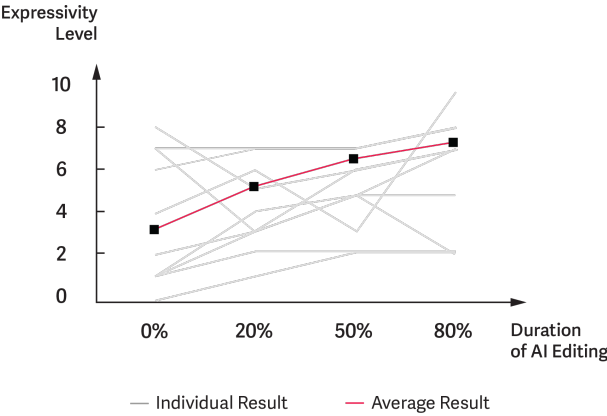図 3: **Dance perception change across different levels of AI editing (P1–P11)**

図 4: **Expressivity ratings across different levels of AI editing (P1–P11)**

(80%). However, several participants still refrained from labelling the motion as "dance" despite higher expressivity scores, suggesting that viewers may rely on an internalised perceptual model of what constitutes dance beyond expressive cues alone. To further explore this, insights were drawn from the semi-structured interviews.

Qualitative Results:

To investigate elements that help viewers judge movement as dance rather than non-dance, two main perceptual drivers emerged. *Form-driven cues* such as symmetry, timing, and repetition were repeatedly cited as signals of intentionality. One participant noted: "When the rhythm started repeating, it no longer felt accidental."

Affect-driven cues such as pauses, exaggeration, and rhythmic flow evoked mood or performance intent. One participant described the 80% clip as "Finally feeling staged, like he was performing for someone." Another participant commented: "The reversed parts gave it a playful energy, which made it expressive even if not strictly dance, and it resonated with me as a dance beginner, as

that would be how I danced."

Others highlighted ambiguity at lower levels: "At 20%, it was just walking with a groove, not yet dance."

These responses indicate that viewers rely on both structural organisation and emotional resonance to interpret movement as dance. Repetition and symmetry created a sense of deliberate design, while playful or exaggerated moments prompted personal identification, particularly for beginners. The shift at 50% and the clear recognition at 80% suggest that once expressive cues accumulate beyond a certain density, viewers begin to reinterpret the entire sequence as potentially choreographed, supporting the possibility of reframing daily movements as dance through algorithmic manipulation.

3.6 Findings

The experiment demonstrates that algorithmic manipulation can shift the perception of everyday movement toward dance, with two key observations. First, at 50% AI-edited duration, participants began to view the sequence as a whole, either interpreting it as dance-like or becoming unsure about rejecting it as "not dance." This suggests that once temporal and rhythmic cues reach a certain density, viewers start to reinterpret the entire movement contextually rather than judging it frame by frame. Second, a clear perceptual threshold appears at 80%, where accumulated rhythmic repetition and temporal disruptions consistently override the default reading of mundane motion. Both structural and affective elements contribute: form-driven cues establish deliberate organisation, while affect-driven cues evoke mood or performative intention. Together, these findings indicate that daily movements can be reinterpreted from a dance perspective when algorithmically reframed.

4. Discussion

The findings highlight two interacting factors that influence the perception shift from mundane motion to dance: the duration of expressive segments and the presence of distinct dance-like movements. At 50% AI-edited duration, participants began to evaluate the video as a whole, often responding "unsure" or even "yes," indicating that longer expressive segments encouraged contextual reinterpretation rather than moment-by-moment judgment. At 80%, where rhythmic repetition and temporal disruptions dominated, consistent recognition as dance was observed.

These results open a design opportunity to compare everyday motions with historical dance movements through machine learning, generating transitional sequences that gradually increase expressive segments to shift personal

perception. Since this pilot relied only on pre-edited clips, future systems should actively explore how gradual algorithmic transitions in both duration and movement complexity affect perception over time.

Participants, most of whom were dance beginners, described the experience as resonant, noting that it made them consider their own potential dance practice. This suggests the value of interactive systems that allow users to experience and manipulate machine-generated transitions in real time, fostering personal engagement with the boundary between ordinary motion and dance.

5. Conclusion

This study shows that algorithmically edited clips combining mundane actions with expressive movements can shift viewers' perception of daily motion toward dance. Two factors appear crucial: longer durations of expressive segments correlate with easier recognition as dance, while the presence of distinct dance-like moments can trigger perceptual shifts even at intermediate levels such as 50%.

Future work will explore interactive systems that compare everyday and historical dance movements, generating machine-assisted transitions to study how real-time engagement alters personal perception. Such methods also provide a potential framework for motion generation in VR, where gradual expressive transitions could guide users to reinterpret their own movements as dance-like.

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