# Detecting Is Not Understanding: Functional, audiovisual, and legal analysis of the algorithmic mediation of human movement

**AUTHORS:**

Torres Ponce, Mariano Enrique

*Lawyer (LL.B.), Specialist in Computer Law*

Moncho, Pablo Daniel

*B.A. in Audiovisual Production and Direction*

Torres, Romina Alejandra

*B.Sc. in Kinesiology*

Arroyo Giuliani, Sandra Susana

*Psychologist, Specialist in Clinical Psychology*

**ABSTRACT**

This work examines the mediation of artificial intelligence in the detection and analysis of human movement in audiovisual contexts, with particular attention to film and advertising, through an interdisciplinary approach that brings together functional, narrative, and legal perspectives. Movement is addressed as a complex object that cannot be reduced either to its technical dimension or to its expressive value, since its algorithmic translation involves decisions that affect the body, the meaning of the image, and the rights of the individuals involved.

From a functional standpoint, the study explores how processes of algorithmic optimization tend to normalize bodily gesture, creating tensions with the adaptive

variability inherent to human movement. From an audiovisual perspective, it analyzes how these mediations affect the narrative construction of gesture, showing how automatic detection indirectly conditions aesthetic and expressive decisions. In parallel, the legal analysis situates bodily movement as information worthy of protection, raising questions about its capture, reuse, and circulation as data, as well as the attribution of responsibility in processes mediated by automated systems.

The work argues that detecting movement is not equivalent to understanding it, and that artificial intelligence operates as a technical mediator that reconfigures gesture according to criteria embedded in its models. Through an applied scenario, the paper illustrates the concrete tensions that emerge when the body is translated into data and reused for creative purposes. As a conclusion, it proposes an integrated approach that preserves the plurality of interpretations of human movement and situates artificial intelligence as a contextual tool, subordinated to functional readings, narrative decisions, and clear normative frameworks.

## KEYWORDS

human movement, artificial intelligence, motion detection, algorithmic mediation, audiovisual production, gesture analysis, functional biomechanics, bodily data, aesthetic normalization, image rights

## EXECUTIVE SUMMARY

Background: The growing incorporation of artificial intelligence into audiovisual production has transformed the ways in which human movement is captured, analyzed, and reused. Systems based on computer vision and pose estimation translate bodily gestures into structured data that can be corrected, stylized, and replicated across digital environments. This transformation extends beyond a technical improvement in detection. It alters how movement is observed, interpreted, and valued within creative processes,

while simultaneously converting the body into a source of information subject to storage, circulation, and reuse. In cinema and advertising, where gesture functions as a primary expressive resource, this shift introduces a new layer of mediation between the lived body and its representation.

Gap: Existing discussions about motion detection technologies tend to focus on technical performance, accuracy, and efficiency. These approaches overlook how algorithmic mediation reshapes the meaning of movement in functional, expressive, and legal terms. Functional analyses of movement rarely consider how technical optimization may conflict with bodily variability and sustainability. Audiovisual analyses often treat detection tools as neutral supports rather than as elements that indirectly condition aesthetic decisions. Legal frameworks, for their part, continue to approach bodily representation through traditional categories of image, authorship, and personal data without fully addressing the continuity between the moving body and its algorithmic translation. What remains insufficiently examined is how these dimensions intersect when movement is treated simultaneously as gesture, data, and object of regulation.

Purpose: This work examines the detection and analysis of human movement through artificial intelligence from an interdisciplinary perspective that integrates functional biomechanics, audiovisual narrative, and legal analysis. It proposes that detecting movement does not equate to understanding it and that artificial intelligence operates as a technical mediator that reconfigures gesture according to criteria embedded within its models. The study aims to clarify how this mediation introduces tensions between bodily sustainability, expressive singularity, and rights over bodily representation, particularly in contexts of audiovisual production.

Methodology: The study adopts a conceptual and analytical approach grounded in interdisciplinary literature from biomechanics, film theory, philosophy of technology, psychology, and legal theory. Rather than evaluating a specific technical system, the analysis focuses on the structural implications of algorithmic mediation. An applied scenario drawn from contemporary advertising production is used as an analytical device to illustrate how movement is captured, translated into data, corrected, and reinserted into a final audiovisual piece. This scenario serves to make visible the interactions between technical intervention, functional limits, aesthetic construction, and legal considerations.

Results: The analysis shows that motion detection systems operate on partial representations of the body defined by prior technical decisions regarding relevance and normality. Algorithmic correction tends to reduce variability, privileging regularity and symmetry that may conflict with adaptive bodily strategies. In audiovisual contexts, this process acts as an indirect aesthetic filter, encouraging movements that are easier to detect and standardize while reducing gestural diversity. From a psychological perspective, gesture cannot be fully interpreted through its external form, as it also expresses subjective dimensions that escape pattern recognition. Legally, the translation of movement into data situates the body within frameworks of personal data protection, image rights, authorship, and responsibility, raising questions about consent, reuse, and control that exceed traditional categories.

Conclusion: Artificial intelligence does not simply improve the detection of movement but redefines how movement is understood, represented, and regulated. Recognizing the distinction between detection and comprehension is essential for preventing technical optimization from becoming the sole criterion guiding creative and functional decisions. An integrated approach that preserves the plurality of interpretations of human movement allows artificial intelligence to function as a situated tool rather than as a governing framework. As audiovisual production increasingly relies on algorithmic mediation, safeguarding the integrity of the body as expressive, functional, and juridical reality requires informed decisions that articulate technical capacity with bodily knowledge, narrative intention, and normative limits.

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## A. INTRODUCTION

Human movement occupies a central place in multiple contemporary practices that cut across creative, technical, and normative domains. In film and advertising, bodily gesture does not operate as a mere physical displacement but as an expressive unit charged with intention, rhythm, and meaning, capable of producing sense even in the absence of words (Phelan, 1993). From a functional perspective, movement is understood as the result of a complex organization that involves neuromotor control, anatomical structure, and continuous adaptation to the environment, where variability plays a key role in the sustainability of action (Latash, 2012). In recent years, the incorporation of artificial intelligence systems for motion detection and analysis has introduced a new form of mediation between the body and its representation, transforming movement into a set of structured data that can be processed and reused across different contexts (Moeslund et al., 2006).

This transformation is not neutral. The conversion of the body into information reshapes the ways in which human movement is observed, interpreted, and acted upon, both from a creative standpoint and from functional and legal perspectives. Gesture ceases to be exclusively a lived and situated experience and becomes, at the same time, a technical object that circulates across systems, platforms, and regulatory frameworks, generating consequences that have yet to be examined in an integrated manner.

## A.1. HUMAN MOVEMENT AS CREATIVE AND TECHNICAL RAW MATERIAL

Human movement can be understood simultaneously as expressive raw material and as a technical phenomenon open to systematic analysis. Within audiovisual practice, the moving body functions as a fundamental narrative resource that contributes to the construction of characters, atmospheres, and emotional registers. The way a body advances, pauses, or engages with space conveys information that is immediately read by the viewer and becomes part of the language through which staging and visual narration operate (Bordwell, 2008).

This expressive dimension coexists with a technical reading of movement, where attention is directed toward patterns, trajectories, temporal structures, and spatial relations that can be observed, measured, and compared. From a functional standpoint, human

movement does not conform to a single ideal model but unfolds within ranges of variability that allow the body to respond to changing demands without compromising integrity or efficiency (Latash, 2012). Such variability is essential for both health and performance, yet it frequently comes into tension with the processes of standardization that characterize many technical systems for motion analysis.

The convergence of these two readings, the creative and the technical, has historically been mediated by human practices such as acting direction, choreography, or bodily training. The emergence of artificial intelligence introduces a different form of mediation, grounded in mathematical models that identify regularities and optimize outcomes according to predefined parameters. This shift reconfigures the status of human movement, which comes to be treated not only as experience and expression but also as a technical input that can circulate across disciplines and systems as an interchangeable resource (Agamben, 2009).

## A.2. FROM OBSERVATION OF THE BODY TO ITS ALGORITHMIC TRANSLATION

The observation of the moving body has traditionally been a situated practice, shaped by context and by the experience of the observer. In both functional analysis and audiovisual production, human perception integrates visual, temporal, and contextual information to construct an interpretation of gesture. Systems for motion detection based on artificial intelligence alter this process by replacing direct observation with an algorithmic translation of the body, grounded in techniques such as pose estimation, keypoint tracking, and statistical modeling (Moeslund et al., 2006).

Within this process of translation, the body is fragmented into discrete units that enable automated processing. Joints, axes, and trajectories are represented as numerical values that can be stored, compared, and reused across applications. While this form of representation offers advantages in terms of scalability and repeatability, it also introduces a distance between the lived body and the modeled body. Artificial intelligence does not apprehend movement as a whole, but only those aspects that have been previously defined as relevant within the structure of the model (Marr, 1982).

The selection of which aspects of movement are detected and which are left aside does not constitute a purely technical decision. It is shaped by cultural, aesthetic, and functional

assumptions that influence both system design and the datasets used for training. In this way, the algorithmic translation of the body does not merely describe movement but actively reconfigures it, privileging certain patterns while disregarding others and producing an appearance of objectivity that obscures the human decisions embedded in the process (Ribeiro et al., 2016).

## A.3. WHY THINK ABOUT MOVEMENT FROM MULTIPLE DISCIPLINES

The analysis of human movement mediated by artificial intelligence raises problems that cannot be adequately addressed from a single disciplinary perspective. A technical reading of movement lacks the tools to assess its expressive or symbolic impact. An aesthetic reading, in turn, does not always account for functional implications or for the biomechanical limits of the body. Added to these tensions is a legal dimension that introduces questions related to data ownership, authorship of resulting productions, and the allocation of responsibility arising from the use of automated systems applied to identifiable bodies (Latour, 2005).

Thinking about movement from multiple disciplines does not mean dissolving specific forms of expertise or forcing an artificial synthesis. It involves recognizing that each field illuminates different aspects of the same phenomenon and that the absence of dialogue generates blind spots. The algorithmic optimization of a gesture may appear effective from a technical standpoint while proving problematic from a functional or expressive perspective. In a similar way, a creative decision may conflict with criteria of bodily sustainability or with existing regulatory frameworks.

The interdisciplinary approach developed in this work is constructed around a shared object rather than through the superimposition of discourses. Human movement, understood as a bodily, expressive, and regulated phenomenon, operates as an articulating axis that allows each discipline to intervene from within its own framework without encroaching on the domain of the others. This mode of articulation is particularly relevant in a context where artificial intelligence technologies tend to homogenize practices under the appearance of technical neutrality (Bourdieu, 1990). It also enables the preservation of conceptual distinctions that might otherwise be flattened by technical vocabularies that privilege measurement over interpretation and optimization over meaning.

## A.4. OBJECTIVES, HYPOTHESIS, AND SCOPE OF THE STUDY

The primary objective of this work is to examine how the detection and analysis of human movement through artificial intelligence reconfigure audiovisual practices, functional understandings of the body, and the legal frameworks that regulate their use. The analysis is grounded in the hypothesis that the algorithmic translation of movement introduces processes of standardization that generate tensions between technical efficiency, bodily expressivity, and the protection of rights, producing concrete effects on audiovisual production processes and on the management of bodily data.

The study adopts a conceptual and analytical approach, supported by relevant literature from each of the fields involved. It does not seek to develop or evaluate a specific technical system, but rather to critically examine the implications of its use in creative and commercial contexts. The analysis focuses on film and advertising, although many of the arguments developed are transferable to other domains in which human movement is captured, processed, and reused through similar technologies.

The scope of the study is limited to the detection and analysis of movement in non-clinical contexts, in order to concentrate the discussion on situations in which the body is simultaneously an object of representation, a source of data, and a subject of rights. Within this framework, the work aims to contribute conceptual elements that support a more conscious, critical, and responsible use of artificial intelligence in the mediation of human movement.

## B. THE MOVING BODY AS AN OBJECT OF ANALYSIS

The body in motion becomes an object of analysis when it ceases to be only a lived experience and comes to be observed, interpreted, and described through specific conceptual frameworks. This shift does not entail an automatic loss of meaning, but it does involve a profound transformation in the way movement is understood and valued. In both functional body analysis and audiovisual practice, movement never appears as an isolated fact, but as a situated manifestation that brings together intention, context, and outcome. The incorporation of automated detection technologies intensifies this process by fixing movement into stable records that enable review, comparison, and reuse, thereby

altering the relationship between body, observer, and representation (Moeslund et al., 2006).

The analysis of movement always entails a process of selection. Not everything the body does becomes visible or relevant to the observer, and this selection responds to criteria that vary according to the field of knowledge involved. In this sense, the analyzed body does not fully coincide with the lived body. It is a construction that emerges from the intersection between bodily materiality and the interpretive framework through which it is approached.

## B.1. MOVEMENT, GESTURE, AND FUNCTIONALITY

From a functional reading, human movement is understood as an action oriented toward a purpose, organized through multiple degrees of freedom that allow adaptation to different conditions without losing effectiveness or stability. The notion of functionality is not limited to mechanical efficiency, but includes the body's capacity to sustain gesture over time, distribute loads, and respond to environmental variability (Latash, 2012). A functional gesture is not necessarily the most energetically economical one, but rather the one that preserves the integrity of the bodily system.

This perspective calls into question models that seek to identify ideal patterns of movement. Variability is not an error to be corrected, but an adaptive resource that enables the body to reorganize itself in response to internal and external changes. When automated detection systems tend to normalize movement based on average patterns, there is a risk of interpreting as deviation what in fact constitutes a legitimate functional strategy.

The functionality of movement cannot be assessed solely on the basis of its external appearance. Two gestures that appear visually similar may involve very different internal loads, with distinct consequences for the body that performs them. This gap between what is visible and what is functional introduces a clear limit to interpretations based exclusively on tracking data and underscores the need to contextualize any automated analysis of movement.

## B.2. THE EXPRESSIVE BODY AND THE MEASURED BODY

Within the audiovisual field, the moving body functions прежде que nada as a vehicle of expression. Gesture produces meaning through its form, its rhythm, and its relationship

with space and with other bodies. This expressive dimension does not depend solely on the technical correctness of movement, but on its capacity to communicate intention and emotion within a given staging context (Bordwell, 2008). The expressive body does not necessarily seek functional efficiency, but rather the symbolic force of the gesture.

The measurement of the body introduces a different logic, oriented toward quantification and comparison. The measured body is fragmented into variables that allow for technical analysis, yet these variables do not directly capture the expressive value of movement. The translation of gesture into data can be useful for certain stages of production and postproduction, but it also tends to detach movement from the scene in which it acquires meaning.

The coexistence of the expressive body and the measured body generates tensions that become particularly visible when technical decisions begin to influence aesthetic outcomes. The automated correction of a movement may improve its formal regularity while simultaneously altering its expressive charge. This tension does not imply an absolute incompatibility, but it does call for a critical reading of the criteria that guide technological intervention in the body on screen.

## B.3. BETWEEN THE BIOLOGICAL, THE SYMBOLIC, AND THE TECHNICAL

Human movement occupies a space of intersection between biological, symbolic, and technical dimensions. From a biological standpoint, movement is an expression of physiological and neuromotor processes that operate within certain limits. From a symbolic standpoint, gesture acquires meaning through shared cultural and narrative conventions. From a technical standpoint, movement is transformed into a set of signals that can be recorded and processed.

These dimensions do not overlap in a harmonious way. A single gesture may be functionally appropriate, symbolically powerful, and technically problematic for an automated detection system. In the same way, a movement optimized according to technical criteria may prove poor in expressive terms or unsustainable from a bodily perspective. Artificial intelligence operates primarily within the technical dimension, yet its effects extend into the biological and symbolic domains, generating shifts that are not always evident to those who design or deploy these systems (Agamben, 2009).

Recognizing this triple dimension of movement helps to avoid reductive approaches. The body is not merely a biological substrate, nor solely a cultural sign, but it also cannot be

treated as a neutral technical object. Any intervention in movement mediated by artificial intelligence entails a position regarding which dimensions are prioritized and which are relegated to a secondary role.

## B.4. THE BODY AS SYSTEM AND AS SIGN

Understanding the body as a system involves recognizing its dynamic, adaptive, and self-regulating character. Movement emerges from the interaction of multiple components that cannot be fully isolated without losing relevant information. This systemic view highlights the limitations of models that approach movement as the mere sum of independent parts (Latash, 2012).

At the same time, the body functions as a sign within specific social and cultural contexts. Movement communicates belonging, intention, and emotional state, and it is interpreted through shared symbolic frameworks. In film and advertising, this semiotic dimension of the body is central to the construction of meaning and to the communicative effectiveness of the image (Phelan, 1993).

Artificial intelligence introduces a form of mediation that tends to privilege the systemic reading of the body at the expense of its symbolic dimension. By focusing on regularities and patterns, automated systems risk neutralizing expressive differences that are meaningful to the viewer. This neutralization is not necessarily a technical error, but rather a consequence of how the body is conceptualized within the model itself.

Analyzing the moving body as both system and sign makes it possible to identify the limits of automated detection technologies and underscores the need to preserve spaces for informed human decision making. Within this framework, interdisciplinary interaction does not aim to unify criteria, but to render visible the tensions that shape the body when it is translated, interpreted, and deployed in contexts mediated by artificial intelligence.

## C. DETECTING IS NOT UNDERSTANDING

Automated detection of human movement is commonly presented as a technical advance aimed at improving precision, speed, and scalability in bodily analysis. Detecting a

movement, however, is not equivalent to understanding it. Detection involves identifying observable regularities within a dataset, whereas understanding requires situating movement within a framework of meaning that integrates context, intention, and consequences. This distinction is central to assessing the impact of artificial intelligence on practices that engage with the body as expressive material, as a functional system, and as a legally relevant entity.

Motion detection systems operate on partial representations of the body, constructed through prior decisions about which variables are deemed significant. These decisions shape the types of movement that can be recognized and, by extension, the forms of intervention that become possible. The gap between detection and understanding does not constitute an accidental failure, but rather a structural characteristic of current algorithmic models for movement analysis (Marr, 1982).

## C.1. WHAT MOTION DETECTION SYSTEMS ACTUALLY DO

Contemporary motion detection systems are based on computer vision techniques that make it possible to identify the position and displacement of bodily segments over time. Working from images or video sequences, these systems estimate key points of the body and reconstruct trajectories that are subsequently analyzed through statistical models or machine learning methods (Moeslund et al., 2006). The outcome of this process is a formal description of movement, expressed through coordinates, vectors, and spatial relations.

This form of detection does not access movement as bodily experience or as expressive gesture. It accesses correlations between visual data that have been previously labeled and normalized. The system does not differentiate between a movement performed with narrative intention and one executed as a functional response to a physical demand. Both appear as comparable sequences within the representational space defined by the model.

The effectiveness of these systems depends largely on the quality and diversity of the data used for training. When datasets reflect a limited range of bodies, gestures, or contexts, models tend to reinforce dominant patterns and to fail when confronted with variations that depart from that norm. This limitation is not always evident to those who use such tools, since detection is often presented as objective and neutral (Ribeiro et al., 2016).

## C.2. PATTERNS, NORMALIZATION, AND LOSS OF CONTEXT

Pattern recognition lies at the core of how automated detection systems operate. Through the repetition of certain movements within training data, models learn to identify regularities that are later applied to new cases. This learning process necessarily entails a normalization of movement, in which configurations deemed typical or expected are privileged.

Normalization is functional for tasks of classification and comparison, yet it introduces a loss of context that affects how gesture is interpreted. Human movement does not occur in a vacuum, but in relation to a physical environment, a narrative situation, and a specific bodily state. By isolating gesture from these conditions, algorithmic detection tends to reduce the complexity of movement to its external form.

From a functional perspective, this reduction can lead to erroneous interpretations regarding the quality or correctness of a movement. An adaptive gesture that responds to a temporary bodily limitation may be classified as a deviation from a normative pattern. From an audiovisual perspective, normalization may attenuate expressive differences that are essential for the construction of meaning within a scene. In both cases, the loss of context is not a minor side effect, but a direct consequence of the way movement is modeled.

## C.3. THE DISTANCE BETWEEN DATA AND MEANING

The data produced by a motion detection system does not carry meaning in itself. Meaning emerges through an interpretive process that goes beyond the available quantitative information. This gap between data and meaning becomes particularly relevant when the results of algorithmic analysis are used to make decisions that affect the body or its representation.

Within the audiovisual field, the translation of movement into data can be used to adjust animations, correct gestures, or standardize sequences. These technical interventions, however, do not assess the expressive value of movement, but rather its conformity to specific formal criteria. The decision to intervene in a gesture on the basis of quantitative data entails the assumption that what is not measured lacks relevance, a premise that proves problematic from a narrative and aesthetic standpoint (Bordwell, 2008).

From a functional reading, data also fails to provide a direct inference about the impact of movement on the body that performs it. Internal loads, fatigue, or compensatory

strategies are not necessarily reflected in the external trajectory of a gesture. Interpreting movement requires situated knowledge that cannot be replaced by the mere automated detection of visible patterns (Latash, 2012).

## C.4. RISKS OF A PURELY ALGORITHMIC READING OF THE BODY

The uncritical adoption of motion detection systems entails the risk of consolidating a purely algorithmic reading of the body. This form of reading tends to privilege what can be measured and compared, relegating dimensions that do not fit easily within the model. The body is treated as a predictable and optimizable entity, one that can be adjusted to externally defined standards.

Such an approach may appear attractive in production contexts where efficiency and repeatability are highly valued, but it introduces significant tensions when applied to real bodies in creative or expressive situations. Automated correction of movement can generate gestures that are visually more regular, while simultaneously diminishing bodily singularity or imposing demands that the body cannot sustain without consequences.

From a broader perspective, an algorithmic reading of the body contributes to reinforcing an idea of technical neutrality that obscures the normative decisions embedded within these systems. These decisions affect not only how movement is represented, but also how it is later valued and put to use. Recognizing the limits of automated detection does not imply rejecting the technology, but rather situating it within a broader interpretive framework that allows it to be articulated with functional, expressive, and legal forms of knowledge (Agamben, 2009).

Understanding human movement requires keeping this distance between detection and meaning open. Only by acknowledging this gap is it possible to integrate artificial intelligence as a mediating tool without delegating to it the interpretation of the body and its meanings.

## D. MOVEMENT, MEANING, AND STAGING

Movement acquires meaning to the extent that it is inscribed within a structure of representation. In the audiovisual field, the moving body does not appear as an isolated phenomenon, but as part of a construction that articulates space, time, and gaze. Staging

organizes movement and assigns it direction, hierarchy, and narrative value. This organization does not respond solely to technical criteria, but to creative decisions that define what is shown, how it is shown, and the intensity with which the viewer is meant to be affected (Bordwell, 2008).

The incorporation of systems for automated detection and analysis introduces a new layer of mediation between the body and the scene. Movement begins to be observed not only by the camera and the director, but also by models that translate it into data and compare it with preexisting patterns. This technical mediation directly influences the way gesture is constructed, evaluated, and eventually corrected, altering the traditional relationship between body, interpretation, and meaning.

## D.1. MOVEMENT AS A NARRATIVE DECISION

In film and advertising, movement is not a spontaneous outcome of the body, but a narrative decision. Each displacement, each pause, and each change of rhythm participates in the construction of the visual story. Bodily gesture can anticipate conflict, reinforce an emotion, or mark a narrative transition without the need for verbal support. This capacity of movement to generate meaning depends on its integration with other elements of staging, such as framing, lighting, and editing (Deleuze, 1985).

From a clinical psychological perspective, bodily gesture cannot be reduced to its formal value or to its explicit communicative function. It operates as a channel through which subjective states are expressed that do not present themselves directly or in a fully conscious manner. Movement gives form to tensions, regulatory processes, and modes of relating to the environment that cannot be fully captured through external appearance nor translated without loss into stable observational patterns (Winnicott, 1965; Stern, 2000).

The narrative decision that organizes movement is not governed by criteria of functional efficiency. A gesture may be deliberately exaggerated, restrained, or fragmented in order to produce a specific effect on the viewer. From this standpoint, the automated correction of movement based on statistical regularities risks intervening precisely in what constitutes its expressive value. Gesture loses its singularity when it is adjusted to a pattern that does not respond to the narrative logic of the scene.

Algorithmic detection of movement can be useful as an analytical tool or as technical support, but it does not replace the narrative reading that situates gesture within a

sequence of meaning. Narrative movement is not defined by its isolated form, but by its relation to what precedes and what follows it, a dimension that exceeds the scope of automated detection systems.

## D.2. THE CONSTRUCTION OF GESTURE IN FILM AND ADVERTISING

Audiovisual gesture is the result of a process of construction that involves direction, performance, and visual composition. The body is worked as expressive material through rehearsals, indications, and adjustments that seek to align movement with the communicative intention of the piece. This process does not aim at the homogenization of gesture, but at its attunement to a specific context and a particular audience (Phelan, 1993).

In advertising, where time is limited and communicative effectiveness is central, movement is often intensified or stylized to produce immediate impact. In film, by contrast, gesture may unfold more gradually, allowing for nuance and ambiguity. In both cases, the construction of gesture responds to an expressive logic that does not lend itself easily to quantifiable parameters, since movement retains a subjective dimension that is not exhausted by its visible appearance (Stern, 2000).

The introduction of tools based on artificial intelligence can modify this process by offering metrics and adjustment suggestions grounded in prior patterns. These tools may influence creative decision making, particularly when they are integrated early into the production workflow. The risk does not lie in their use as such, but in the tendency to conflate technical regularity with expressive quality, displacing artistic criteria in favor of indicators derived from automated analysis.

## D.3. WHEN TECHNICAL OPTIMIZATION SHAPES AESTHETICS AND BODILY EXPRESSION

Every technology applied to audiovisual production introduces conditions that influence the aesthetic outcome. Cameras, lighting systems, and editing tools have historically shaped the ways in which movement is captured and represented. Artificial intelligence enters this lineage with a relevant specificity, since it does not merely register movement but also analyzes it and compares it against normative models.

When technical decisions begin to condition the aesthetics of movement, a shift occurs in the relationship between creation and tool. Gesture may be adjusted in advance to facilitate detection or to comply with optimization criteria defined by the system. This prior adaptation of the body to the logic of the tool entails an inversion of the creative process, in which movement ceases to be freely designed and instead becomes compatible with a specific technical model.

This conditioning is not always explicit. It often manifests as a preference for movements that are cleaner, more symmetrical, or more predictable, as these are easier to process and correct. From an audiovisual perspective, such a tendency can impoverish gestural diversity and reduce the body's capacity to generate complex or ambiguous meanings (Bordwell, 2008).

The automation of processes linked to bodily movement opens new possibilities in terms of efficiency and control. Automated gesture correction, precise synchronization, and algorithmic stylization make it possible to intervene in the body with a degree of precision that is difficult to achieve manually. These possibilities are particularly appealing in contexts of accelerated production and constrained budgets.

At the same time, the automated correction and stylization of movement raise questions about the status of the represented body. A corrected gesture ceases to be a direct expression of the body that performs it and becomes an optimized version shaped by external criteria. This optimization can alter not only the appearance of movement, but also its relationship to the real corporeality that sustains it.

From a functional perspective, extreme stylization may promote models of movement that are difficult for real bodies to sustain, especially when such models are reused as references. From an audiovisual perspective, automation can generate a form of aesthetic homogenization that dilutes bodily singularity and reduces the expressive richness of gesture. These tensions highlight the need to critically assess the effects of automation on the body on screen.

The fluidity of human movement is not defined by the absence of irregularities, but by the body's capacity to articulate variation without losing coherence. This fluidity is perceived by the viewer as naturalness, even when the gesture itself is highly constructed. Technical optimization, by contrast, tends to eliminate irregularities in accordance with criteria of stability and repeatability.

The tension between human fluidity and technical optimization becomes visible when automated systems intervene in movement with the aim of making it more regular or efficient. The result may be a gesture that is technically correct yet lacking in expressive vitality. This loss is not always evident in data analysis, but it becomes clear in the perception of movement as a communicative act.

Recognizing this tension does not entail rejecting technology, but rather situating it within a framework of informed decision making. Artificial intelligence can function as a supporting tool in the construction of audiovisual movement, provided that it does not replace the sensitive reading of gesture or the understanding of its narrative value. Maintaining this balance is essential to preserving the capacity of the moving body to produce meaning in creative contexts mediated by technology.

## E. THE FUNCTIONAL BODY AND THE OPTIMIZED BODY

The incorporation of technologies for automated analysis and correction of movement introduces a central tension between two ways of understanding the body. On one hand, the functional body, understood as an adaptable biological system whose priority is the sustainability of movement over time. On the other, the optimized body, shaped by technical criteria that seek regularity, visual efficiency, or conformity with predefined patterns. This tension is not merely conceptual, but becomes evident in concrete practices where movement is evaluated, adjusted, and reused through tools based on artificial intelligence.

From a functional perspective, movement cannot be separated from the internal conditions of the body that produces it. Strength, coordination, fatigue, and adaptive capacity operate in an integrated manner, generating motor solutions that do not always align with idealized models. Technical optimization, by contrast, tends to abstract movement from these conditions, privileging its external appearance and formal consistency. The contrast between these two logics makes it possible to identify limits and risks associated with the uncritical use of automated systems for bodily analysis.

### E.1. BIOMECHANICS, EFFICIENCY, AND VARIABILITY

The biomechanics of human movement is grounded in the recognition of variability as an essential component of function. Far from constituting an error, variability allows loads

to be distributed, temporary constraints to be compensated, and changes in the environment to be accommodated without compromising the integrity of the bodily system (Latash, 2012). A functional movement is not one that is repeated in an identical manner, but one that remains effective through small adaptive differences.

The notion of biomechanical efficiency cannot be reduced to minimizing energy expenditure or maximizing gestural regularity. It includes the body's capacity to sustain movement without generating unnecessary overloads or patterns of cumulative stress. From this perspective, optimization efforts that seek to eliminate visible variations may interfere with legitimate functional strategies, replacing them with solutions that appear cleaner but prove less sustainable.

Automated detection systems often interpret variability as noise, since it complicates the identification of stable patterns. This interpretation follows a technically coherent logic, yet it conflicts with biomechanical understandings of human movement. Reducing variability in the name of optimization may produce visually homogeneous movements that nonetheless become problematic from a functional standpoint.

## E.2. FUNCTIONAL LIMITS OF ALGORITHMIC OPTIMIZATION OF MOVEMENT

There is a fundamental difference between what a body is capable of executing at a given moment and what it can sustain over time without adverse consequences. This difference is not always visible in external analyses of movement. A gesture may be formally successful while simultaneously involving excessive internal effort or compensatory strategies that are not viable in the long term.

Algorithmic detection of movement is limited to registering what the body does, not what the body can bear. Internal loads, force distribution, and compensatory mechanisms are not necessarily reflected in the external trajectories of a gesture. When decisions of correction or adjustment are based exclusively on visible data, there is a risk of promoting movements that exceed the functional capacities of the body that performs them (Bernstein, 1967).

In creative contexts, this gap may go unnoticed, particularly when the focus is placed on visual outcome. However, the reuse of optimized movements as references or standards

can amplify this problem, generating bodily expectations that fail to account for the diversity of bodies and functional conditions.

Algorithmic corrections of movement are typically oriented toward improving symmetry, stability, or gestural regularity. While these criteria may be useful in certain technical contexts, they do not constitute direct indicators of bodily functionality. Automated correction can eliminate compensatory adjustments that fulfill a protective role, thereby exposing the body to increased risks of overload or injury.

From a functional reading, any intervention in movement should take into account the context in which the gesture is produced and the characteristics of the body that performs it. Automated systems, operating on generalized models, lack this contextual sensitivity. The indiscriminate application of corrections based on average patterns can lead to a homogenization of movement that disregards individual needs (Latash, 2012).

Functional risk does not necessarily manifest immediately. It may emerge as progressive wear associated with the repetition of optimized gestures that fail to respect the internal organization of the body. This delayed temporality complicates the identification of the link between algorithmic intervention and its bodily consequences, reinforcing the perception of technical neutrality.

The boundary between technical improvement and bodily distortion is not always clear. From an external point of view, a correction may be perceived as an evident enhancement of movement. From a functional perspective, however, that same correction may entail a forced reorganization of gesture that compromises the body's capacity for adaptation.

Bodily distortion is not limited to visible deformations. It may manifest as a loss of variability, a progressive rigidity, or an increasing dependence on externally imposed patterns. When movement is repeatedly adjusted to meet technical criteria that are alien to bodily logic, the body is pushed toward configurations that do not emerge from its own functional organization (Bernstein, 1967).

Recognizing this boundary requires an expert reading of movement that cannot be replaced by automated metrics alone. Artificial intelligence may provide valuable information about the form of a gesture, but it cannot by itself determine whether an intervention constitutes a functional improvement or a concealed form of distortion.

## E.3. CONSEQUENCES FOR CREATIVE AND TECHNICAL PRACTICE

The tension between the functional body and the optimized body has direct consequences for creative and technical practices that work with human movement. In the audiovisual field, the adoption of optimized movement models can influence the ways in which bodies are trained, directed, and selected for the scene. Reference to algorithmic patterns may displace criteria grounded in expressivity and bodily diversity.

From a functional perspective, such practices can contribute to the dissemination of bodily models that are difficult to sustain, particularly when optimized movements are presented as desirable standards. The gap between the represented body and the real body widens, generating expectations that fail to take into account the complexity of human motor organization.

Analyzing the functional body in relation to the optimized body makes it possible to render these tensions visible and to underscore the need for intervention criteria that integrate biomechanical knowledge, expressive sensitivity, and technical awareness. Only through such integration can artificial intelligence tools be employed without reducing the body to an object of permanent adjustment.

## F. ARTIFICIAL INTELLIGENCE AS A MEDIATOR OF MOVEMENT

Artificial intelligence does not intervene in human movement as an autonomous agent or as a neutral observer. It operates as a technical mediator that translates, orders, and reconfigures bodily gesture according to criteria embedded within its models. This mediation does not merely record existing movement, but actively influences the ways in which the body is observed, evaluated, and used in creative and technical contexts. Understanding the role of artificial intelligence as a mediator allows attention to shift from the supposed capabilities of the technology to the decisions that structure its operation and its effects.

Algorithmic mediation is built through successive layers of abstraction that separate the lived body from its technical representation. Each layer introduces filters, assumptions, and simplifications that shape the types of movement that can be detected and the kinds of intervention that become possible. This dynamic turns artificial intelligence into a

relevant actor within the chain of movement production, even when it does not appear visibly in the final scene (Latour, 2005).

Automated detection of gesture does not operate solely as a descriptive technology, but as a form of mediation that redefines the field of what becomes possible in movement. By translating gesture into data that can be compared and adjusted, these systems shift control from situated interpretation toward preconfigured parameters that govern action through their mode of functioning. This logic does not introduce explicit coercion, but a technical normalization that legitimizes its effects through efficiency, inscribing bodily movement within a form of governance by architecture in which optimization replaces command and judgment becomes progressively embedded in system design (Torres Ponce, 2022).

## F.1. THE TRANSLATION OF GESTURE INTO DATA

The translation of bodily gesture into data constitutes the first act of algorithmic mediation. Movement is transformed into a series of quantifiable variables that allow for automated processing. This translation involves a prior selection of which aspects of the body are considered relevant and which remain outside the model. Joints, axes, and trajectories acquire centrality, while other dimensions of gesture become less visible.

This operation is not equivalent to a simple capture of movement. Algorithmic translation reorganizes gesture according to a formal logic that responds to the capacities of the system and to the objectives for which it was designed. The body ceases to be a dynamic continuum and becomes a discretized structure, open to comparison and adjustment. In this process, gesture loses part of its contextual depth and is reinserted into a representational space that privileges regularity and repeatability (Marr, 1982).

From both creative and functional perspectives, this translation introduces a clear limit. Data does not preserve the full meaning of movement nor its relationship to bodily experience. Algorithmic mediation does not eliminate gesture, but transforms it into something different, with properties and uses that do not fully coincide with the original movement.

## F.2. NORMATIVITY, BIAS, AND THE ILLUSION OF NEUTRALITY IN ALGORITHMIC MODELS

Artificial intelligence models incorporate decisions that are not always evident to those who use the tools. The selection of datasets, labeling criteria, and training parameters defines which movements are recognized as normal, correct, or desirable. These decisions operate quietly, shaping an implicit normative framework that guides the interpretation of gesture.

The invisibility of these decisions contributes to the perception of technical neutrality. The results of algorithmic analysis are often presented as objective descriptions of movement, when in fact they reflect prior choices about which bodies, gestures, and contexts were considered representative. This opacity makes critical evaluation more difficult and shifts responsibility toward the technology, rather than keeping it with those who design and apply the systems (Ribeiro et al., 2016).

Recognizing the existence of these invisible decisions is essential for understanding the real scope of algorithmic mediation. Artificial intelligence does not introduce its own criteria, but amplifies those embedded in its design and projects them onto new bodies and situations.

Algorithmic mediation of movement tends to reinforce processes of bodily and aesthetic normalization. When models are trained on limited datasets, certain types of bodies and gestures acquire a normative status that is later projected onto subsequent analysis. Movements that depart from these patterns may be interpreted as errors, deviations, or imperfections.

Within the audiovisual field, this normalization can influence both the construction of gesture and the selection of bodies for the scene. A preference for movements that are easily detectable and correctable may encourage homogeneous aesthetics that reduce gestural diversity. From a functional perspective, biases embedded in the models can obscure legitimate adaptive strategies, reinforcing a reductive view of human movement (Latash, 2012).

Aesthetic normalization does not arise solely from artistic decisions, but may be induced by the technical logic of detection systems. Algorithmic mediation thus operates as a filter

that conditions which movements are valued and which are relegated, producing effects that extend beyond the technical domain.

Artificial intelligence is often presented as an objective tool capable of improving precision and eliminating human bias. This presentation, however, conceals the situated character of algorithmic mediation. Systems do not operate in a vacuum, but within social, cultural, and technical frameworks that shape their design and application. Technological neutrality functions as an illusion that makes it more difficult to identify responsibility and to critically assess the effects of the system (Agamben, 2009).

In the analysis of human movement, this illusion is reinforced by the apparent exactness of the data produced. Coordinates, trajectories, and quantitative metrics create a sense of control and objectivity that does not necessarily correspond to a deep understanding of gesture. Algorithmic mediation thus acquires an authority that can displace other forms of knowledge, even when these may be more appropriate for interpreting movement in specific contexts.

Dismantling the illusion of neutrality does not mean delegitimizing the use of artificial intelligence, but repositioning it within a network of decisions and responsibilities. Algorithmic mediation must be understood as one more instance in the construction of movement, open to evaluation and revision from functional, expressive, and normative perspectives.

## F.3. ALGORITHMIC MEDIATION AS A SPACE OF DECISION

Conceiving artificial intelligence as a mediator of movement makes it possible to recognize it as a space of decision rather than as a mere technical instrument. Each stage in the process of detecting, analyzing, and correcting movement involves choices that affect how the body is represented and how it is subsequently used. These choices may be explicit or implicit, yet in all cases they have consequences for gesture and for the bodies that produce it.

Algorithmic mediation can be oriented toward a critical and situated use when its limits are acknowledged and when other forms of reading movement are brought into the process. The interaction with functional and audiovisual forms of knowledge allows data to be contextualized and prevents reductive interpretations. In this sense, artificial

intelligence does not replace the understanding of movement, but becomes part of a broader process of analysis and decision.

Situating algorithmic mediation within this framework is essential for the development of responsible practices that engage with the moving body. By recognizing that artificial intelligence actively participates in the construction of gesture, it becomes possible to design and use these technologies in a more conscious way, preventing technical optimization from becoming the sole criterion of evaluation.

## G. THE BODY AS DATA AND AS RIGHT

Algorithmic mediation of human movement introduces a profound legal transformation that affects the status of the body and its representations. When movement is captured, processed, and stored through artificial intelligence systems, it ceases to be only a bodily manifestation and also becomes information subject to legal treatment. This conversion is not neutral, as it displaces the body from the realm of physical presence into the domain of data, with direct implications for rights, responsibilities, and forms of control.

The legal analysis of movement mediated by artificial intelligence does not stop at the protection of image rights or the intellectual property of an audiovisual work. It involves broader issues related to personal identification, the reuse of bodily information, and the attribution of responsibility within automated processes. In this context, the body appears simultaneously as an object of representation, a source of data, and a subject of rights, which calls for an approach that recognizes this overlap without reducing it to traditional legal categories.

### G.1. BODILY MOVEMENT AS SENSITIVE INFORMATION

Human movement, once captured and translated into data, can acquire the status of sensitive information insofar as it allows a person to be identified directly or indirectly. Bodily trajectories, patterns of displacement, and gestural dynamics may function as identifying elements, even when facial features or other data traditionally considered biometric are not recorded (Ohm, 2010). This capacity for identification places movement within the scope of personal data protection.

From a legal perspective, it is not decisive whether the system was designed for creative or technical purposes. What matters is the effect of the processing on the person to whom the movement refers. The capture and analysis of bodily gesture generate an informational trace that can be stored, cross referenced, and reused in contexts different from the one in which it was originally produced. This persistence of data creates a temporal mismatch between the present body and its digital representation, increasing the risk of unintended uses.

The sensitive character of bodily movement is further intensified when data is used to train models or to establish reference patterns. In such cases, the individual body becomes diluted within a larger dataset, yet its contribution persists indirectly, raising questions about the scope of consent and the real possibility of control for those involved.

## G.2. IMAGE RIGHTS AND THE REPRESENTATION OF THE BODY

Image rights protect a person's authority to decide over the capture, reproduction, and dissemination of their appearance. When movement is transformed into abstract data, however, the traditional notion of image becomes insufficient to encompass new forms of bodily representation. The body can be reconstructed, animated, or stylized from information that no longer appears as a direct image, yet still maintains an identifiable connection to the original person (Pagallo, 2018).

In audiovisual contexts mediated by artificial intelligence, the representation of the body may become partially detached from its physical support. A captured movement can be applied to a different digital body or reused in another scene while preserving expressive traits that refer back to the original subject. This dissociation poses a challenge to existing legal frameworks, which often link the protection of image to its direct visual reproduction.

Protecting the represented body therefore requires expanding legal interpretation toward these derived forms of representation. Bodily gesture, even when stylized or transformed, retains an identity dimension that does not disappear through technical abstraction. Recognizing this continuity is essential to avoid normative gaps in the creative use of motion detection and animation technologies.

## G.3. AUTHORSHIP AND CO-AUTHORSHIP IN PROCESSES MEDIATED BY ARTIFICIAL INTELLIGENCE

The involvement of artificial intelligence systems in the detection and correction of movement introduces additional complexities regarding authorship. In traditional audiovisual production, authorship is distributed among those who make direct creative decisions about the work. When movement is modified or generated through automated processes, questions arise about the status of these interventions and about the attribution of creative responsibility (Ginsburg, 2018).

From a legal perspective, artificial intelligence is neither a subject of rights nor of obligations. Its participation in the creative process, however, can significantly influence the final result. The automated detection of patterns, the algorithmic correction of gesture, and stylization based on prior models introduce elements that cannot be attributed solely to individual human intention.

This situation does not eliminate human authorship, but reconfigures it. Creative responsibility shifts toward those who design, select, and apply the tools, as well as toward those who decide whether to accept or reject the results produced. Clarity in these roles is essential to avoid a dilution of responsibility that ends up attributing to technology decisions that in fact arise from human frameworks of choice.

## G.4. SECONDARY USE AND REUSE OF MOVEMENT DATA

One of the most problematic aspects of treating movement as data lies in its potential reuse in contexts different from those for which it was originally captured. Movement data can be stored and later used to train models, generate new animations, or establish reference standards without the direct involvement of the original subject. This secondary use raises questions about the scope of consent and about the legitimacy of these subsequent forms of processing (Solove, 2021).

In creative environments, the reuse of movements may be presented as an efficient and technically justified practice. From a legal perspective, however, the progressive separation between the body and its informational representation amplifies the risk of loss of control. The subject may no longer know where, how, or for what purposes their bodily data is being used.

The difficulty of tracing and limiting these secondary uses is intensified by the cumulative nature of artificial intelligence systems. Each new training process incorporates additional layers of information that make it practically impossible to isolate individual contributions. This dynamic places significant pressure on the principles of purpose limitation and data minimization that structure personal data protection.

## G.5. RESPONSIBILITY AND CONTROL IN BODILY ANALYSIS SYSTEMS

Attributing responsibility in bodily analysis systems mediated by artificial intelligence presents a central challenge. When a decision based on movement data produces negative effects, whether in terms of representation, exclusion, or indirect functional harm, it becomes necessary to identify who is accountable for those consequences. The technical complexity of the system does not exempt those who implement and use it from responsibility.

From a legal perspective, effective control over the system becomes a key criterion. Those who decide to incorporate an automatic detection tool, define the parameters of its use, and validate its outputs assume responsibility for the effects that follow from that decision. Delegation to technology does not eliminate this responsibility, even if it tends to obscure it in practice.

Recognizing the body as both data and a bearer of rights requires affirming that the algorithmic mediation of movement must be subject to standards of legality, proportionality, and meaningful human control. This position does not seek to hinder technological innovation but to establish limits that protect bodily integrity and personal autonomy in contexts where the body is translated, reused, and reinterpreted through artificial intelligence systems.

## H. INTERDISCIPLINARY ZONE OF INTERSECTION

The intersection between functional, audiovisual, and legal perspectives does not arise from the superposition of discourses but from the observation of the same object through distinct frameworks that intersect without becoming confused. Human movement mediated by artificial intelligence serves here as a point of contact that compels each discipline to confront the limits of its own approach. This zone of intersection does not

seek to resolve tensions but to render them visible and productive, allowing for a more complex understanding of the phenomenon under analysis.

Within this space, movement ceases to be solely an expressive gesture, a functional pattern, or a legal datum and becomes instead a hybrid object whose interpretation depends on the angle from which it is observed. Artificial intelligence acts as a catalyst for this intersection by introducing a technical mediation that simultaneously traverses the three fields without fully belonging to any of them.

## H.1. WHEN FUNCTIONAL READING AND NARRATIVE MEANING INTERSECT

From a functional perspective, movement is evaluated according to its sustainability, adaptability, and internal coherence. This reading provides essential criteria for understanding what a real body can sustain beyond the external appearance of the gesture. When this perspective enters into dialogue with audiovisual narrative, a productive tension emerges between what the body can perform in a healthy manner and what the scene requires in order to construct meaning.

Audiovisual narrative may demand extreme gestures, intense repetitions, or sustained postures that are effective in expressive terms but that do not always take into account the functional conditions of the body. A functional reading does not invalidate these decisions, but it introduces a dimension of analysis that allows their bodily costs to be assessed. This dialogue does not seek to limit creation but to make visible the bodily implications of narrative decisions that often become naturalized in practice (Bordwell, 2008).

At the same time, gesture in audiovisual contexts does not operate solely as a mechanical action but as a carrier of meaning that emerges through the body's relation to space, rhythm, and presence. The moving body is not only performing an action but expressing a way of being situated in the world, a dimension that cannot be fully reduced to its external form (Merleau-Ponty, 2012; Phelan, 1993).

The dialogue between disciplines is not unidirectional. Just as a functional reading can problematize certain narrative decisions, audiovisual narrative also reshapes what is understood as functionality within a creative context. A movement that, from a strictly

biomechanical perspective, might be considered inefficient can acquire full meaning when it is inscribed within a specific expressive logic.

In this framework, the functionality of movement is not reduced to physiological criteria but includes the capacity of the gesture to fulfill a communicative role. This expansion does not deny the limits of the body, but it introduces a situated notion of functionality that depends on narrative context and on the representational device. The body does not move only in order to sustain itself, but also in order to signify, often expressing dimensions of subjective experience that are not immediately visible in the gesture itself (Stern, 2000).

Algorithmic mediation tends to erase this contextual dimension by evaluating movement according to general patterns. Interdisciplinary dialogue allows the recovery of the idea that functionality is not an absolute category but a relation between body, intention, and environment, a relation that artificial intelligence cannot determine on its own.

## H.2. LAW AS A FRAMEWORK OF BALANCE

The legal dimension introduces a framework that belongs neither to the functional nor to the narrative sphere, yet proves essential for articulating both. Law does not assess the quality of movement or its expressive effectiveness, but the conditions under which that movement may be captured, transformed, and reused. In this zone of intersection, law operates as a balancing element that defines what is permitted, what can be attributed, and where responsibility lies.

When movement is mediated by artificial intelligence, functional and narrative decisions acquire legal consequences. The reuse of movement data, the algorithmic stylization of gesture, and the application of normative patterns affect rights connected to identity, image, and control over bodily information. Law does not intervene to determine how a body should move, but to establish limits on how that movement is treated as data.

This legal framework does not resolve the tensions between disciplines, but it introduces criteria that require those tensions to be made explicit. The need for consent, the delimitation of uses, and the attribution of responsibility act as points of anchoring that prevent technological mediation from developing within a normative vacuum.

## H.3. RISKS OF DISCIPLINARY FRAGMENTATION

The absence of dialogue between disciplines encourages a form of fragmentation that amplifies the risks associated with the use of artificial intelligence in the analysis of human movement. When technical approaches operate without functional awareness, they may promote gestures that are unsustainable for real bodies. When narrative practices rely uncritically on automated tools, they may lose sensitivity to the corporeal dimension of the gesture. When legal analysis is applied in an abstract manner, it may prove ineffective in the face of concrete practices.

Disciplinary fragmentation reinforces the illusion that each field can independently resolve the challenges introduced by algorithmic mediation. This illusion leads to partial solutions that shift conflicts to other levels rather than addressing them directly. Interdisciplinary engagement does not remove this complexity, but it allows it to be recognized and approached with greater awareness.

## H.4. BENEFITS OF AN INTEGRATED APPROACH

An integrated approach does not require the fusion of disciplines or the invention of an artificial common language. It calls for the creation of controlled spaces of translation where each field retains its authority and its limits. Within these spaces, human movement can be examined as expressive gesture, as functional action, and as legally relevant data without any of these dimensions cancelling the others.

When artificial intelligence is situated within this framework, it ceases to function as a guiding criterion and becomes a tool that must be interpreted. Data does not replace bodily reading or creative decision making, and it does not displace legal responsibility. This balance makes it possible to benefit from the technical capacities of automated systems without reducing the body to an object of constant optimization.

The interdisciplinary zone of intersection thus emerges as a productive space for rethinking the place of human movement in practices mediated by technology. Rather than offering closed answers, this encounter opens questions that can only be addressed through sustained interaction between disciplines willing to acknowledge the complexity of the body as a starting point.

## I. APPLIED SCENARIO

Examining an applied scenario makes it possible to observe in concrete terms how functional, audiovisual, and legal dimensions interact when human movement is mediated by systems based on artificial intelligence. Rather than presenting an exemplary or normative case, the scenario operates as an analytical device that renders visible the tensions developed in the previous sections. The focus is not on the technical validation of a specific tool but on a situated reading of its effects on the body, the scene, and the framework of rights involved.

The scenario unfolds within an advertising audiovisual production in which automatic motion detection is used to assist animation processes and gestural adjustment. A real body is captured through video, its movements are translated into data, and this data is then used to correct, stylize, or replicate gestures in a final piece intended for commercial circulation.

## I.1. DESCRIPTION OF THE ANALYTICAL SCENARIO

In the proposed scenario, a person performs a sequence of movements designed to convey dynamism and bodily control within a short advertising piece. The initial recording takes place in a controlled environment, with lighting and framing arranged to facilitate automatic motion detection. From the recorded material, an artificial intelligence system estimates key points of the body and reconstructs the trajectories of the gesture over time.

The data generated is used to adjust the animation of a digital model that reproduces the original movement with modifications intended to enhance the regularity and symmetry of the gesture. The final result presents a visually fluid and homogeneous movement aligned with the aesthetic criteria defined for the campaign. This process, common in contemporary production practices, makes it possible to observe clearly the transition from the lived body to the represented body through algorithmic mediation.

## I.2. TECHNICAL MEDIATION AND ITS FUNCTIONAL AND AUDIOVISUAL CONSEQUENCES

The intervention of the detection system focuses on identifying gestural patterns considered desirable according to predefined parameters. The model prioritizes clean trajectories and stable spatial relationships between body segments, reducing variations

that may be interpreted as noise. This intervention does not create the movement from scratch, but it introduces adjustments that alter the final form of the gesture (Marr, 1982; Moeslund et al., 2006).

From a technical standpoint, the operation is effective. The resulting movement is consistent, easily reproducible, and compatible with other elements of the audiovisual piece. The logic of detection, however, does not distinguish between functional variations and expressive variations. What is removed as irregularity may correspond either to a legitimate bodily adaptation or to a deliberate expressive decision. The intervention thus operates as a filtering instance that reorganizes movement according to criteria internal to the system, often under an appearance of technical neutrality that conceals the model's internal assumptions (Ribeiro et al., 2016). These assumptions include implicit models of proportion, symmetry, and temporal continuity that are rarely visible to users yet strongly influence the outcome.

From a functional perspective, this filtered movement raises questions about its bodily sustainability. The removal of variations may have suppressed adaptive strategies that allowed the body to distribute loads or compensate for specific demands of the sequence. The final gesture, although visually regular, does not necessarily reflect a movement that the body could sustain under real conditions of repetition (Bernstein, 1967; Latash, 2012). A functional reading does not assess the aesthetic quality of the result, but the internal coherence of the gesture in relation to bodily organization. The optimized movement may imply a forced alignment or a muscular demand that does not correspond to the original dynamics. This distance between the represented gesture and the executed gesture introduces a risk when the optimized movement is reused as a reference or model, especially in training environments or iterative productions where repetition amplifies minor distortions over time.

From an audiovisual perspective, the generated movement effectively fulfills its communicative function. The regularity of the gesture reinforces the idea of control and precision associated with the advertising message. The algorithmic stylization contributes to an aesthetic coherence with other visual elements of the piece, facilitating the integration of the animated body within the overall scene (Bordwell, 2008). This effectiveness, however, relies on a reduction of gestural singularity. The movement loses nuances that could have introduced ambiguity or narrative tension, yet which are not functional for the specific communicative objective. Subtle hesitations, micro-

adjustments, and temporal irregularities that often enrich the expressive quality of gesture are smoothed out in favor of visual clarity.

The audiovisual interpretation recognizes the value of the result without ignoring that this value is built upon a selection. The represented body is not the body that originally moved, but a filtered version shaped by criteria of visual clarity and formal coherence, where the expressive potential of the body is partially subordinated to the logic of representation (Phelan, 1993).

## I.3. LEGAL ANALYSIS OF THE SCENARIO

From a legal standpoint, the scenario raises questions related to the treatment of movement as data and to the attribution of responsibility. The captured movement, once translated and reused, constitutes information linked to an identifiable person, even when the final outcome takes the form of a stylized animation. This link activates obligations concerning consent, purpose limitation, and the subsequent reuse of the data.

The use of movement data to train or refine models also prompts questions about the scope of the consent originally granted. The person performing the gesture may have authorized its use for a specific piece, but not necessarily for derivative uses or for the generation of movements that circulate detached from their original body.

Responsibility for the effects of this use lies with those who choose to implement and validate the system. Algorithmic mediation does not remove the need for human oversight nor does it shift accountability onto the technology. The scenario highlights the importance of clear contractual and regulatory frameworks that acknowledge the specific nature of bodily movement as data.

## I.4. LESSONS AND TENSIONS OBSERVED

The applied scenario makes it possible to identify relevant lessons for the three disciplines involved. Artificial intelligence shows a clear capacity to intervene effectively in the production of movement, yet it also reveals structural limits in its understanding of the body. The functional reading points to risks associated with uncritical optimization, while the audiovisual interpretation shows how technical mediation can be productively integrated into a creative process.

The tensions observed are not faults to be corrected but inherent features of the interaction between body, technology, and representation. Recognizing these tensions allows for the design of more conscious practices that incorporate algorithmic mediation without reducing movement to a purely technical object. The scenario thus confirms the need for an interdisciplinary approach that keeps open the different ways of reading the moving body.


## J. DISCUSSION

The path developed throughout this work allows us to state that the algorithmic mediation of human movement does not introduce a new problem but intensifies preexisting tensions between body, representation, and control. Artificial intelligence does not create the distance between lived gesture and represented gesture, yet it formalizes it, accelerates it, and makes it reproducible at scale. This intensification calls for a reconsideration of categories that, while operational in analog contexts, become insufficient in practices where movement circulates simultaneously as data, as image, and as a normative reference.

One of the central findings is the persistent confusion between detection and understanding. Across the different sections, it becomes clear that artificial intelligence systems provide descriptive capacity regarding the external form of movement but do not produce an understanding of gesture in functional or narrative terms. This limitation is not contingent nor solvable through incremental improvements of the model, since it derives from the very logic of algorithmic translation. The risk appears when detection results are used as decision criteria without additional mediation, displacing situated forms of knowledge that have historically interpreted the body through experience, expert observation, and context.

From a functional perspective, the discussion shows that technical optimization tends to operate on movement as if it were an entity isolated from the body that produces it. Algorithmic correction privileges visible regularities and eliminates variations that, far from being errors, fulfill essential adaptive functions. This shift not only affects the sustainability of movement in real bodies but also contributes to the dissemination of implicit bodily models that are difficult to sustain in practice. By normalizing gestures,

artificial intelligence introduces a standard that appears technical yet produces concrete bodily effects.

In the audiovisual domain, the discussion reveals that algorithmic mediation acts as an indirect aesthetic instance. Although systems do not make explicit narrative decisions, they condition the range of movements that are compatible with the technical production workflow. The preference for clean, symmetrical, and easily detectable gestures encourages an expressive homogenization that can conflict with the search for singularity and ambiguity inherent to audiovisual language. Technology does not impose an aesthetic in an authoritarian manner, but it persistently suggests one through its operational criteria.

From a clinical psychological perspective, the reduction of gesture to its observable form introduces an additional limitation, since bodily movement also operates as a channel for subjective states that do not appear in a transparent or stable way within visible action. Gesture does not communicate only narrative intention or functional performance but also carries dimensions of experience that cannot be directly translated into recognizable patterns, even when movement is technically correct or aesthetically effective (Winnicott, 1965; Stern, 2000). This subjective opacity reinforces the idea that automatic detection cannot serve as a sufficient criterion for understanding gesture.

The legal dimension provides a necessary counterpoint by showing that these transformations do not remain confined to the technical or creative sphere. Treating movement as data exposes the body to forms of reuse and circulation that exceed the original production context. The discussion highlights how current normative frameworks tend to fragment the protection of the body into image, personal data, and authorship, without fully capturing the continuity between these dimensions when movement is mediated by artificial intelligence. This fragmentation complicates the attribution of responsibility and weakens individuals' effective control over their bodily representations.

A transversal element of the discussion is the illusion of technological neutrality. At every level analyzed, artificial intelligence appears invested with a technical authority that shifts attention away from human decisions toward system outputs. This illusion does not hold when one examines models, training data, and correction criteria in detail. Algorithmic mediation does not eliminate normativity but displaces it to less visible layers, making it

harder to question. Recognizing this dynamic is essential to prevent technology from functioning as a device of de-responsibilization.

This tension becomes particularly visible in the current regulatory landscape. The EU AI Act (Regulation (EU) 2024/1689) establishes specific obligations for high-risk AI systems, especially in relation to biometric uses and data derived from the human body. However, the regulatory framework largely operates at the level of detection, classification, and risk management, without fully addressing the deeper distinction examined throughout this work between detecting movement and understanding gesture. The law acknowledges the sensitivity of bodily data, yet it does not resolve how algorithmic mediation reshapes the meaning of what is captured, represented, and later reused.

The interdisciplinary interaction developed in this work supports the view that none of the disciplines involved can, on its own, account for the complexity of the phenomenon. The functional reading identifies risks invisible from an aesthetic perspective. The audiovisual reading detects losses of meaning that do not appear in technical analysis. The legal reading introduces limits and obligations absent from creative practice. Clinical psychology adds further confirmation that gesture is not fully legible from its exteriority. Artificial intelligence, situated within this network, ceases to be an end in itself and becomes an element that must be interpreted and governed.

The discussion does not lead to a closed normative conclusion but to a methodological warning. The use of artificial intelligence in the detection and analysis of human movement requires decision frameworks that integrate heterogeneous forms of knowledge without subordinating them to a single logic of optimization. Where movement is reduced to data, the understanding of the body is impoverished. Where data is ignored, relevant technical capacities are lost. The challenge lies in maintaining the tension between these dimensions without prematurely resolving it in favor of one of them.

Ultimately, this work proposes shifting the question from what artificial intelligence can do with movement to how decisions are made about what is done with movement once it has been translated. In that decision lie not only technical and aesthetic issues but also ways of understanding the body, its limits, and its rights in an environment increasingly mediated by algorithmic systems.

## K. CONCLUSIONS

The path developed throughout this work allows us to affirm that the algorithmic mediation of human movement cannot be adequately understood from a single discipline nor evaluated exclusively in terms of technical efficiency. When movement is captured, processed, and reused through artificial intelligence systems, it becomes a hybrid object that inseparably articulates bodily, expressive, and legal dimensions. This transformation does not eliminate the tensions between these dimensions but makes them structural and therefore unavoidable in any serious analysis of the phenomenon.

One of the central contributions of this work lies in clearly establishing that detecting movement is not equivalent to understanding it. Artificial intelligence operates on partial representations of gesture, shaped by technical selections that determine which aspects of the body become visible to the system and which remain outside its field of reading. This operation produces data that is operational and useful for certain purposes, but it does not replace the understanding of movement as situated bodily action, as gesture charged with meaning, or as an expression of internal states. Confusing detection with understanding leads to an improper delegation of decisions that directly affect the body and its representation.

From a functional perspective, the analysis has shown that algorithmic optimization tends to enter into tension with the adaptive logic of the human body. Reducing variability in the name of technical regularity can produce movements that appear visually consistent yet are functionally problematic. This shift is not a minor side effect but a structural consequence of models that privilege the external form of gesture over its internal organization. Recognizing this limit is essential to prevent technology from operating as a mechanism of normalized bodily distortion.

In the audiovisual domain, the analysis supports the idea that algorithmic mediation acts as an indirect aesthetic instance. By conditioning which movements are more easily detectable, correctable, or reusable, artificial intelligence influences creative decisions even when it does not explicitly formulate them. This influence does not eliminate artistic agency, but it introduces a persistent pressure toward gestural homogenization that can impoverish expressive diversity on screen if it is not consciously recognized and managed.

The incorporation of a clinical psychological perspective reinforces this conclusion from a different standpoint. Bodily gesture is neither fully transparent nor exhaustible in its visible form. It also serves as a channel for subjective dimensions that do not present themselves in a stable or directly translatable way within observable patterns. This inherent opacity introduces an additional limit to any claim of understanding based solely on automatic detection, even when movement appears technically correct or aesthetically effective.

The legal dimension situates these transformations within a framework of rights and responsibilities that is not always considered in technical and creative practices. Once translated into data, human movement acquires legal relevance as information linked to identifiable persons and as the basis for derivative representations. This condition demands clear criteria regarding consent, purpose limitation, and the attribution of responsibility, especially in contexts where the reuse of bodily data becomes structural and cumulative.

An important outcome of the approach adopted here is the avoidance of both forced integration of knowledge and simple juxtaposition. Each discipline intervenes from its own position of authority while acknowledging that the object under analysis exceeds any isolated reading. This form of transversal engagement does not seek to resolve the tensions between body, technology, and law but to sustain them as a necessary condition for a more rigorous and honest understanding of the phenomenon.

This work does not advocate rejecting artificial intelligence applied to movement analysis, nor does it idealize practices prior to its introduction. Instead, it proposes repositioning technology within informed decision processes, where the data produced by automated systems is interpreted in light of bodily knowledge, narrative criteria, and normative frameworks. In this configuration, artificial intelligence ceases to operate as a guiding criterion and becomes a situated and limited tool.

In a context where human movement increasingly circulates as data, image, and technical standard, this work argues for preserving the body as an object of plural interpretation. Maintaining this plurality is not an obstacle to technological innovation but a condition to ensure that such innovation does not occur at the expense of bodily integrity, expressive richness, and the rights of the individuals whose movements are translated, reused, and resignified through artificial intelligence systems.

# REFERENCES

Agamben, G. (2009). *What is an apparatus and other essays*. Stanford University Press.

Bernstein, N. A. (1967). *The coordination and regulation of movements*. Pergamon Press.

Bordwell, D. (2008). *Poetics of cinema*. Routledge.

Bourdieu, P. (1990). *The logic of practice*. Stanford University Press.

Deleuze, G. (1985). *Cinema 2. The time image*. University of Minnesota Press.

European Union. (2024). *Regulation (EU) 2024/1689 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act)*. Official Journal of the European Union.

Ginsburg, J. C. (2018). *People not machines. Authorship and what it means in the Berne Convention*. Columbia Public Law Research Paper.

Latash, M. L. (2012). The bliss of motor abundance. *Experimental Brain Research, 217*(1), 1–5.

Latour, B. (2005). *Reassembling the social*. Oxford University Press.

Marr, D. (1982). *Vision*. W. H. Freeman.

Moeslund, T. B., Hilton, A., & Krüger, V. (2006). A survey of advances in vision based human motion capture and analysis. *Computer Vision and Image Understanding, 104*(2–3), 90–126.

Ohm, P. (2010). Broken promises of privacy. Responding to the surprising failure of anonymization. *UCLA Law Review, 57*, 1701–1777.

Pagallo, U. (2018). *The laws of robots. Crimes, contracts, and torts*. Springer.

Phelan, P. (1993). *Unmarked. The politics of performance*. Routledge.

Ribeiro, M. T., Singh, S., & Guestrin, C. (2016). Why should I trust you. Explaining the predictions of any classifier. In *Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 1135–1144).

Solove, D. J. (2021). The myth of the privacy paradox. *Georgetown Law Journal, 89*, 1–51.

Stern, D. N. (2000). *The interpersonal world of the infant. A view from psychoanalysis and developmental psychology*. Basic Books.

Torres Ponce, M. E. (2022). *Del panóptico al datapoint. Vigilancia y control por arquitectura* [Preprint]. Zenodo.

Winnicott, D. W. (1965). *The maturational processes and the facilitating environment. Studies in the theory of emotional development*. International Universities Press.