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New Forms of Alienation in Interpersonal Relationships in the Age of Embodied Intelligence: Manifestations, Causes, and Paths of Transcendence

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Abstract. As embodied intelligence moves human-machine interaction into physical settings, it is changing how people communicate,keep one another company,and build social ties. At the same time, it produces new forms of communicative alienation. Drawing on Marx's theory of alienation,this paper identifies four main manifestations: the reification of communication media,the technological deconstruction of the communicating subject,the algorithmic distortion of interpersonal emotions,and the instrumentalization of interaction goals. The point is not abstract. These problems grow out of the combined operation of capital,technological,and data logics.From this basis,the paper proposes four responses: rebuilding communicative subjectivity,restoring the value of communication media,protecting the specificity of human emotion from excessive datafication,and fostering a community that supports free communication. Taken together,these arguments offer a theoretical perspective for understanding interpersonal dilemmas in the age of embodied intelligence.

Keywords: Embodied Intelligence, Marx's Theory of Alienation, Philosophy of Technology, Digital Capitalism.

1. Introduction

The expansion of technology does more than add new conveniences to existing forms of interaction. It can change the conditions in which people relate to one another. Research on alienated social relations has usually examined this issue in the context of capitalism. In the Economic and Philosophic Manuscripts of 1844,Marx linked alienated social relations to alienated labor: relations that should express human sociality can instead be organized around survival,exchange,interest,and power.

Embodied intelligence adds a further element to this process. Alienation may now extend beyond relations among people to relations mediated by,and increasingly carried out through,intelligent machines. This shift matters. Heavy reliance on such systems may weaken either the motivation or the ability for sustained interpersonal contact. Algorithmic intervention can also limit autonomous judgment,while the physical presence of intelligent machines makes the line between simulated and

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real interaction less clear. These developments suggest a need to examine more closely how alienation is produced in embodied forms of communication.

2. Manifestations of alienation in interpersonal relationships under the influence of embodied intelligence

Marx's theory of alienation offers a useful starting point for this examination.Once intelligence acquires a physical form,technology is no longer simply a background tool used in communication.It can become part of the medium through which people communicate,influence the communicating subject,process emotional expression,and shape the purposes for which interaction takes place.The following analysis therefore considers four related manifestations of alienation: changes in the status of communication media,changes in the communicating subject,changes in emotional interaction,and changes in the aims of interaction.

2.1. The embodiment of communication media

Communication media connect people in concrete social situations and provide the material conditions through which interaction becomes possible.As Yang Jingye observes, communication media can become internalized by the communicating subject and form part of the subject's capacity for mediated communication [1]. In ordinary interpersonal communication,language,symbols,gestures,and bodily presence carry information as well as emotion.Their value lies in transmitting a message and in letting one person answer another in ways that cannot be fully pblueetermined. Embodied intelligence changes this arrangement. Here,the reification of communication media means that interaction is gradually separated from the participants' own emotional connection and organized instead by rules built into an intelligent system. A medium that was once fairly open to the people using it becomes a structublue object shaped by external technical requirements.

This shift is especially clear in companion-type embodied intelligence. Conventional companionship depends on being together,responding to each other,and letting the relationship develop without a fixed script. With an embodied intelligent system,however,companionship can be broken down into identifiable operations: a request is recognized,a state is recorded,and a response is generated according to the system's programmed logic. Emotional information can then be collected,processed,and returned as a machine-generated response.

The result is not necessarily that interaction disappears. What changes is its quality. The system starts to take part in defining what counts as effective interaction,while users may also adjust their expressions to what the system can recognize. In this situation,communication may become less open and less responsive to individual differences. Interaction still continues, but the warmth and spontaneity that give interpersonal communication its distinct character are harder to maintain.

From the perspective of alienation theory,this reversal is familiar: tools created by people gain organizing power over those who use them. The medium then becomes one site through which technological discipline reaches the interacting subject. The transformation described above also echoes the concern raised in [2] that embodied intelligence is becoming an increasingly consequential mediator of human activity.

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2.2. The technological deconstruction of the communicating subject

The technological deconstruction of the communicating subject marks a further step in this process.Here,technology is no longer merely the channel through which interaction occurs; it begins to shape the person who interacts.Individuals with their own thoughts,emotions,and judgments are gradually encouraged to adapt themselves to technical procedures and machine-readable forms of expression.The result is a form of subject alienation in which people increasingly organize their behavior around the requirements of the system.This development is closely connected with the reification of communication media discussed above: once the medium is structured by technological rules,the subject must also adapt to those rules.

Embodied intelligence makes this dynamic especially clear through a cycle of perception,decision,and execution.Repeated interaction with systems that require standardized commands can encourage users to think about communication in similarly standardized terms.From the human side,people learn to phrase requests in ways that machines can recognize and to treat technical compatibility as a condition of successful interaction.From the technological side,recommendation systems,historical data,and continuous feedback can influence whom a person encounters,what content is presented,and how an interaction proceeds.In this arrangement,some communicative choices that once required personal judgment are increasingly delegated to the system.Smart personal assistants and shopping assistants provide familiar examples: users often have to follow a defined sequence of commands or selections before the system can respond.Such adaptation may seem trivial in an individual interaction,but repeated accommodation can gradually narrow expressive habits and reduce the space for flexible interpersonal judgment.In Marx's view,people are constituted through their social relations.When the organization of those relations is increasingly shaped by instrumental technological requirements,the social dimension of human agency can itself become weakened.

2.3. The algorithmic distortion of interpersonal emotions

Emotional communication is different from the transmission of ordinary information.It contains uncertainty,tacit understanding,shared memories,and responses that cannot always be reduced to explicit rules.The algorithmic distortion of interpersonal emotion appears when this open-ended process is reorganized according to machine-readable categories.In an embodied intelligent system,an emotional exchange may be broken into a sequence of recognizable events—asking,waiting,responding,and confirming.What was once an ambiguous interaction between two people is thereby turned into a series of signals that a system can record and evaluate.Once such signals become data,they can also be used to define what the system treats as a normal or successful emotional response.Emotional work that depends on humor,timing,tact,or shared experience is then at risk of being reproduced through programmed patterns rather than arising from the relationship itself.Interpersonal communication may remain active,but its emotional content becomes increasingly symbolic and procedural.As discussed in [3], the standardization of emotional interaction is particularly important when intelligent terminals begin to shape how people express and respond to emotion.

The problem is not simply that machines fail to reproduce every nuance of human feeling.More importantly,people may begin to adapt their own emotional expression to what the system is capable of recognizing.Instead of responding only from their immediate feelings,they learn which words,gestures,or interaction patterns will generate an appropriate machine response.In this sense,the medium itself becomes alienated from the person's lived emotional experience.Traditional

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companionship often includes silence,hesitation,shared presence,and forms of understanding that require no explicit confirmation.Algorithmic interaction tends to favor what can be detected and processed.The richer,less predictable dimensions of emotional exchange are therefore compressed into standardized forms.

Once emotional interaction is organized as a sequence of measurable operations,convenience can come at the expense of spontaneity.The system may make communication faster or easier,while also encouraging users to judge interaction by whether the expected response has been produced.Over time,the machine's definition of effective emotional communication can become more influential than the participants' own experience of the relationship.What appears to be an expansion of communicative choice may thus conceal a gradual loss of the human element in communication.

2.4. The instrumental distortion of interaction goals

Interpersonal relationships are not sustained only because they produce useful outcomes.They also have value in themselves: people seek companionship,recognition,emotional comfort,and a sense of belonging.

In this sense,interaction can be an end rather than just a means. Modern social life,however,increasingly encourages people to treat relationships instrumentally. Others are often judged by what they can offer,whether that is information,opportunities,resources,or status. Embodied intelligence may strengthen this pattern because it makes interaction easier to measure and organize around preset goals. A relationship that might once have grown through mutual recognition can turn into a process of choosing contacts,exchanging resources,and weighing what comes back.

This shift changes more than the outward form of social contact. It also shapes how people understand each other. When usefulness becomes the main standard,sincerity and trust are harder to maintain,and relationships become more selective and unstable. People may start asking whether an interaction is worth their time,whether another person has something to offer,or whether a connection has measurable value. That matters here.

The anxiety that follows is not only an individual psychological issue; it comes from a wider social logic in which interaction is assessed by utility. From Marx's perspective,alienation occurs when human relations are cut off from the needs and capacities they should express. If interpersonal communication becomes subordinate to external purposes,the relationship itself is treated as an instrument.

3. An analysis of the roots of interactional alienation in the context of embodied intelligence

The four manifestations described above point to a common problem,but they do not arise from technology alone.Embodied intelligence has social consequences because its development is tied to capital accumulation,technological rationality,and the production and use of data. These forces work through different mechanisms,but they often strengthen each other. Capital encourages the conversion of interaction into a resource. Technological systems then organize behavior according to their own operating logic,while data processes turn human activity and emotion into information that can be processed and circulated. For this reason,alienation is better understood by looking at the social relations behind the technology,not the machine in isolation.

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3.1. Value colonization of interpersonal relationships driven by the logic of capital

Under digital capitalism,embodied intelligence can be more than a tool used in daily life. It can become part of the basic system through which capital draws value from social activity. Interpersonal interaction usually develops within ordinary life and depends on emotional attachment,mutual recognition,and relatively open forms of association. Its value is not blueucible to an external return. By contrast,once intelligent communication is commercialized,interaction is more likely to be organized around measurable engagement and data that can be exploited.

The spread of companion technologies shows this clearly. Platforms set the conditions under which interaction takes place,and intelligent devices can influence when,how,and with whom users interact. At the same time,information about behavior,emotional states,and patterns of communication may be collected and treated as a resource. A personal relationship with an intelligent device can therefore feed into a wider process of data extraction and monetization.

This changes how interaction is judged. Sincerity,trust,and empathy are hard to quantify,while visibility,clicks,traffic,and follower numbers are easy to measure. Users may then adjust their behavior to fit platform incentives,cultivate particular personas,or produce content mainly to attract attention. In that situation,the technology that might have supported human emancipation is pulled into the logic of accumulation. People are not only users of intelligent systems; under certain conditions,their activity itself becomes a source of value within those systems. This concern aligns with the argument in [4] that embodied intelligence is changing the relationship between technological substitution,human–machine symbiosis,and labor emancipation.

From this perspective,the instrumentalization of social interaction is not just an isolated change in behavior. It points to a broader colonization of the human lifeworld by digital capitalism.Capital extends its reach through intelligent technologies into activities that were previously shaped mainly by social and emotional relations.Interaction becomes another area where attention emotion,and data are arranged for accumulation.That is why alienation produced by embodied intelligence cannot be addressed simply by asking whether a particular device is useful or harmful.

3.2. The disciplining of interactants' perception under the expansion of technological logic

The expansion of technological logic operates differently,but it can be equally consequential.In earlier forms of technological use,people generally encountered technology as an external tool: they selected it,operated it,and could set it aside.Embodied intelligence weakens this clear separation.Smart companion devices,emotional robots,and other embodied systems remain present in everyday environments.They sense physical states,respond to behavior,and make predictions about what users may want.Technology thus becomes part of the setting in which perception and interaction take place rather than something used only at a particular moment.

Algorithmic systems sit at the center of this shift. Embodied intelligence can use large datasets and learned models to give ongoing recommendations and responses, rather than just carrying out a single command. As that happens,the information people see and the options placed before them may increasingly follow rules built into the system. Who appears in a recommendation, what content is visible, and which response is suggested are no longer decided only by the user. The risk is less about direct coercion than about a gradual narrowing of the range within which choices are made.

This process resembles what Foucault described as disciplinary power: control does not always work through explicit commands,but through arrangements that lead individuals to regulate themselves. Intelligent systems can operate in much the same way. By repeatedly presenting certain

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options,rewarding particular behaviors,and returning feedback in data-driven forms,they may lead users to adjust their behavior without feeling that they are being coerced.

Dependence on system feedback may then grow,while independent judgment becomes less prominent.Users still appear to choose freely,but the range of choices they encounter has already been structured by the system.Technological discipline therefore works most effectively when it becomes part of ordinary habits rather than appearing as an external restriction.

3.3. The symbolic production of interpersonal emotions under a data-dependent mechanism

Datafication provides another route through which alienation develops.Technologies such as facial recognition,speech analysis,and behavioral tracking allow embodied intelligence to infer emotional states from observable signs.Complex experiences such as joy,anger,sadness,or anxiety can then be represented through discrete data categories.Something that was once primarily a subjective experience is converted into an object that can be stored,compared,and processed.This conversion makes emotion technically manageable,but it also changes its status.Once emotional experience is represented as data,it becomes available for further processing and circulation.Intelligent devices are nevertheless limited by the categories available to them.People who want a system to respond effectively may therefore simplify what they feel or express emotions in forms that the system is more likely to recognize.In AI companionship and related applications,emotional responses can even be packaged as repeatable products.Warmth and attentiveness become features that can be reproduced at scale,rather than experiences that emerge uniquely from a particular relationship.

Human emotion is not simply another type of information.It is changeable,ambiguous,and closely tied to personal history and context.Algorithmic systems,by contrast,depend on consistency,predictability,and operational efficiency.The tension between these two characteristics becomes particularly visible when emotional life is brought into data-driven interaction.The more people become accustomed to simple,predictable emotional responses,the greater the risk that forms of communication requiring patience,empathy,and sensitivity to ambiguity will lose their place in everyday relationships.

The result is a form of emotional alienation.Emotions that once belonged to the singular relationship between people can become elements in a data-production process.They are captured,classified,reproduced,and potentially commercialized.Capital,technology,and data thus intersect: emotional life is made legible to technical systems,and what becomes legible can also become economically valuable.In this process,the distinctive and non-reproducible character of human emotion is gradually subordinated to the requirements of accumulation and system operation.

3.4. The continual blurring of interaction boundaries in a blended virtual-real world

Embodied intelligence also changes the spatial conditions of interaction.Technologies associated with virtual reality and human–computer interaction can connect virtual and physical environments and make social presence less dependent on physical co-location.The result is a mixed social space in which the distinction between virtual and real interaction is less stable than before.At the same time,the distinction between interacting with another person and interacting with an intelligent machine can become less obvious.These changes do not automatically produce alienation,but they create conditions in which the boundaries on which traditional interpersonal relations have relied are increasingly difficult to maintain.

Face-to-face interaction has traditionally depended on physical presence,bodily contact,and nonverbal cues.The setting and participants are usually identifiable,and the relationship develops

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within a shared physical context.Embodied intelligence introduces a different arrangement.As virtual environments become more immersive and intelligent systems acquire a physical presence,activities that once required direct human contact can be reproduced or supplemented in digital spaces.The physical setting consequently becomes less decisive.At the same time,embodied systems can imitate human patterns of behavior,emotional expression,and conversational response.Their realism makes the interaction feel increasingly social even though the other party is a machine.With prolonged use,people may come to rely on these interactions and find them easier than relationships marked by disagreement,uncertainty,and misunderstanding.The distinction between human-to-human and human-to-machine communication can then become blurred at both the cognitive and emotional levels.

Embodied intelligent systems are often designed to respond smoothly to users' emotional needs.Unlike ordinary interpersonal relationships,which inevitably involve conflict and friction,machine-mediated companionship can be highly compliant and predictable.That difference can make artificial companionship attractive,especially when real relationships feel difficult to manage.The risk is that users may increasingly withdraw from the complexity of human relationships in favor of interactions that are easier to control.Marx's claim that human essence is realized in the ensemble of social relations is important here [5]. If technologically mediated companionship gradually replaces rather than supplements relationships with other people,the problem is not merely a change in communication style; it is a weakening of the social relations through which human beings develop themselves.

The mixed virtual–real environment created by embodied intelligence therefore raises a deeper problem than simple confusion between reality and simulation.It can alter where,with whom,and under what conditions people experience social connection.As the boundaries between human and machine,and between physical and virtual interaction,become less distinct,individuals may become more detached from the concrete relationships and communities that sustain social life.This detachment represents another form of communicative alienation.

4. Pathways to transcending the alienation of interaction through embodied intelligence

Overcoming these forms of alienation does not require a wholesale rejection of embodied intelligence.The more fundamental task is to prevent technological systems from displacing human agency and the social value of interaction.The following discussion moves from the subject to the medium,then to emotion and finally to community,corresponding to the four problems identified above.

4.1. Adhering to the people-centered principle to reconstruct communicative subjectivity

The first task is to deal with the weakening of communicative subjectivity. As the earlier analysis suggests,technological deconstruction and technological discipline can push people to adjust themselves to machine logic. From a Marxian perspective,this inverts the proper relation between human beings and what they create: people produce technologies,yet those technologies may then organize and restrict their activity. Reconstructing communicative subjectivity therefore means restoring people's capacity to judge,choose,and interrupt technological processes,rather than removing intelligent devices altogether.

Three measures matter here. Digital literacy should involve a critical understanding of technology,not just training in how to use software. Educational institutions can help people see the difference between simulated machine responses and reciprocal human emotion,and they can also

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make clearer how algorithmic systems shape individual choices. Product design should also give users real control. Companion systems,for example,should let users pause or end interactions,and they should leave room for human intervention when an exchange involves emotionally sensitive matters or important decisions. Institutional protections are also needed so that users have the right to know when algorithmic recommendations are being used and the right to refuse or limit that intervention. The aim is simple: systems should answer to users.

The point is not to return to a world without digital technology. Intelligent systems should remain subordinate to human purposes instead. Rebuilding communicative subjectivity means preserving the ability to think independently and sustaining forms of interaction that cannot be blueuced to machine-readable procedures. This is where technological governance and data regulation have to begin.

4.2. Strengthening "technology for good" governance to correct the value distortions of interaction media

The second task concerns the value of communication media.The earlier discussion showed that embodied intelligence can become entangled with the commercial logic of digital platforms.Marx's critique of technology in Capital reminds us that technology cannot be understood apart from the social relations in which it is developed and used.Within capitalist relations of production,technological innovation can be directed toward accumulation rather than toward the quality of human interaction.Correcting this distortion therefore requires changes not only in individual behavior but also in product design,platform rules,and institutional governance.

Ethical transparency should begin at the design stage.Intelligent products need to make clear what kinds of data they collect and,at least in accessible terms,how those data inform system behavior.This can reduce the possibility that opaque algorithms silently shape users' communicative choices.Regulation should also be differentiated according to the degree of immersion and emotional involvement involved.Products designed for intensive companionship,for example,warrant closer ethical scrutiny before deployment.Finally,governance should involve government,researchers,platforms,and the public rather than leaving technological development to market incentives alone.A broader governance structure can place limits on the use of traffic and emotional dependence as sources of profit.

Technology-for-good governance,in this sense,is not a matter of assuming that technology is automatically beneficial.It means placing institutional limits on the expansion of technological and commercial power after reaffirming the central role of the human subject.The aim is to create communication environments in which intelligent systems support,rather than define,the value of social interaction.

4.3. Refining data ethics standards to overcome the dilemma of the symbolization of interpersonal emotions

The third task is to protect emotional life from excessive datafication.Embodied intelligence depends on emotional data when it attempts to simulate responsive interaction,but the conversion of complex experiences into standardized symbols can strip them of context and uniqueness.Once such symbols enter systems of storage,circulation,and commercial use,the privacy and integrity of emotional experience become harder to protect.Data ethics must therefore address the collection and use of emotional information while also considering the wider cultural conditions that encourage people to rely on programmed forms of companionship.

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First,clear limits should be placed on the collection and use of emotional data.Information about emotions,bodily states,and voice should be collected for defined purposes and should not be freely repurposed or resold.Second,the commercialization of emotional algorithms needs stronger scrutiny,particularly where products are designed to cultivate emotional dependence as a business model.Third,the social value of face-to-face emotional relationships should be actively supported.Community activities,reading groups,and other offline forms of association can provide spaces in which emotional connection develops without being organized by programmed responses.Protecting emotional life is therefore not only a question of data privacy.It also involves preserving forms of human connection whose value lies precisely in their uniqueness and irreducibility to data.

4.4. Building a community of interaction to achieve the free and comprehensive development of humanity

The preceding measures address the subject,technology,and data,but they remain incomplete if the broader social environment is ignored.The ultimate purpose of overcoming communicative alienation is to sustain a community in which people can develop through genuine relations with others.This idea is consistent with Marx's notion of the free association of individuals: the development of each person should provide the conditions for the development of all.

At the individual level,digital citizenship education can help people recognize the risks of replacing human relationships with simulated companionship. It can also encourage them to keep taking part in offline social life. At the community level,embodied intelligence can help maintain connections and improve access to information,but it should not replace collective activity. At the societal level,public infrastructure for digital interaction needs to remain accessible across different age groups and social strata so that technological development does not add a new layer of inequality.

A community-oriented approach does not mean abandoning embodied intelligence. The point is to guide technological development through shablue social values rather than capital accumulation or algorithmic efficiency alone. If individuals,communities,and institutions reinforce one another,intelligent technology can remain a support for social life instead of becoming its main organizing principle. Under those conditions,the possibility of free and comprehensive human development can still be preserved within real social relationships.

5. Conclusion

Drawing on Marx's theory of alienation,this paper examined how embodied intelligence may produce new forms of alienation in interpersonal communication. Its physical presence changes the conditions in which communication takes place and lets technology intervene in the medium of interaction as well as the subject,emotional process,and purpose of communication.

The paper identified four forms of alienation: the reification of communication media,the technological deconstruction of the communicating subject,the algorithmic distortion of interpersonal emotions,and the instrumentalization of interaction goals. More specifically,these forms appear to arise through the interaction of capital,technological,and data logics. The point is broader than any single device. Limiting particular technologies may help to some extent,but it is not enough on its own. What is also needed is a wider effort to restore human agency,regulate technological and commercial power,protect emotional data and experience,and support the social conditions that make genuine communication possible.

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Because this study is theoretical,it does not establish how communicative alienation differs across groups or application settings. That remains unclear. Later research could examine these differences empirically and look more closely at how technological usefulness might be balanced with the value of human social relations.

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