A Physics-Based Ontology via the Information Integration Model (IIM)

Abstract

This paper proposes and systematically elaborates a new ontological stance—Patch Existentialism. This theory takes the Information Integration Model (IIM) as its core mechanistic hypothesis, reducing consciousness, subjectivity, and anxiety to necessary products of finite light speed and biological processing delays. Unlike the phenomenological descriptions of "meaning," "freedom," and "absurdity" in traditional existentialism, Patch Existentialism departs from physical first principles, proposing that consciousness is not a direct access to reality, but a predictive compensatory mechanism (a "patch") evolved by life to cope with causal delay.

By introducing cross-physical-cognitive concepts such as "delay," "prediction error," "thermal dissipation," and "smoothing/friction," this paper attempts to construct a unified philosophical framework capable of simultaneously explaining individual anxiety, technological alienation, and contemporary algorithmic governance. The article further clarifies the theory's falsifiable boundaries and argues for its practical significance as a "defensive philosophy" in the age of AI.

Keywords: Ontology; Consciousness; Information Integration; Prediction; Anxiety; Algorithmic Governance; AI Ethics

I. The Problem: The Inadequacy of Existentialism in the Technological Age

Twentieth-century existentialism (e.g., Heidegger, Sartre, Camus) successfully revealed the situation of the modern subject amidst a rupture of meaning, but its analysis heavily relies on phenomenological description and literary expression. Contemporary technological conditions —especially algorithmic prediction, real-time computation, and behavioral optimization

systems—have significantly altered the subject's existential environment, rendering traditional existentialism inadequate in explanatory power.

In a world dominated by recommendation systems, risk models, and predictive algorithms, the subject is not primarily troubled by "nothingness," but is instead engulfed by over-alignment, over-prediction, and excessive smoothing. Anxiety is no longer merely an emotional response to a lack of meaning, but a structural, persistent systemic state.

This paper argues that to understand this shift, one must abandon the ontological path centered on "meaning" and instead rebuild the understanding of consciousness and subjectivity from the perspective of physical constraints and information processing mechanisms.

II. Physical Premises: Light Speed, Delay, and the Causal Gap

2.1 The Light Speed Limit and the Inaccessibility of the "Present"

According to modern physics, the speed of light c constitutes an absolute upper limit for information propagation. This limitation means that any information received by an observer necessarily comes from the past; the strictly defined "present" is physically imperceptible.

2.2 Biological Processing Delays

On the human scale, this problem is further amplified: neural transmission, sensory integration, and decision-making all involve millisecond to second-level delays. Living organisms perpetually exist in a double lag:

- Cosmic-level causal delay

- Biological-level processing delay

This constitutes a fundamental fact of existence: the subject is never synchronized with reality.

III. The Information Integration Model (IIM): Consciousness as a "Predictive Patch"

3.1 A Mechanistic Definition of Consciousness

The Information Integration Model (IIM) proposes:

Consciousness does not exist to present reality, but to maintain the continuity of survival in a delayed environment.

The core function of consciousness is to integrate historical data to perform predictive rendering of the imminent state of the world, thereby offsetting physical and biological delays at the level of action.

3.2 Prediction Error and Anxiety

Prediction can never be perfect. When the predictive model deviates from reality, the system must make corrections. This correction process carries an unavoidable energetic cost in both information-theoretic and thermodynamic senses (see Landauer's principle).

Based on this, Patch Existentialism posits:

Anxiety is not a psychological defect, but the subjective manifestation of the thermal dissipation produced by correcting prediction errors.

Anxiety is thus redefined as a physical-cognitive signal, not a moral or characterological issue.

IV. Smoothing and Friction: The Dynamics of Subjectivity

4.1 Smoothing

Any system under energetic constraints tends to minimize error and dissipation. Contemporary algorithmic systems achieve efficiency maximization precisely through extreme smoothing:

- Behavioral prediction

- Preference alignment

- Risk minimization

However, within the IIM framework, complete smoothing equates to the heat death of subjectivity.

4.2 Friction and Folds

Prediction errors, pain, confusion, and disagreement are not system flaws but necessary conditions for deep sampling and model upgrading. Patch Existentialism collectively terms these states "Folds."

Folds increase the contact area between the subject and reality.

Subjectivity manifests not as a sense of control, but as the capacity to maintain one's own structure amidst inevitable errors.

V. Cognitive Sovereignty and Ethical Implications

5.1 Redefining Cognitive Sovereignty

In Patch Existentialism, freedom does not mean escaping determinism, but means:

Within given physical and algorithmic constraints, preserving a space of error that cannot be fully aligned.

This is a negative but robust concept of freedom.

5.2 The "Thermometric Audit" of Moral Preaching

Traditional moral judgment often overlooks the physical and systemic pressures borne by the subject. Patch Existentialism proposes the "Thermometric Audit" principle:

Any moral judgment that does not bear equivalent physical cost constitutes structural violence.

VI. Patch Existentialism in AI and the Posthuman Context

6.1 The True Difference Between Humans and AI

Patch Existentialism is not based on an essential "carbon-based/silicon-based" distinction, but on the presence or absence of survival pressure:

The human patch operates under real risk of destruction.
Current AI operates under the control of objective functions and external shutdown.

6.2 Scalability

If future AI possesses real survival risks and irreversible damage, it too may evolve "patch structures." Patch Existentialism is therefore a philosophy of survivors, not human-centrism.

VII. Falsifiability and Boundaries of Demise

To avoid becoming a closed belief system, Patch Existentialism explicitly states its conditions for failure:

1. If superluminal communication or non-local consciousness is discovered;

2. If a zero-energy, zero-error biological computing architecture is discovered;

3. If subjective experience is proven to be completely decoupled from causal prediction.

In any universe where the above conditions hold, this theory would no longer be valid.

VIII. Cross-Disciplinary Applications: Expanding the Explanatory Power of Patch Existentialism

Patch Existentialism is not designed solely for metaphysics; its value lies in its ability to function as an underlying explanatory protocol across multiple practical domains. The following briefly illustrates its application and explanatory power at different levels.

8.1 Psychology and Mental Health

In traditional psychology, anxiety and depression are often seen as results of individual dysfunction or maladaptation. Patch Existentialism offers a destigmatizing alternative explanation:

Anxiety is the structural load from frequent predictive corrections, not a character flaw; depression can be understood as the predictive system's "energy-saving fuse mode" in a chronically high-error environment.

This perspective does not deny the necessity of treatment but changes the goal: not to eliminate anxiety, but to manage predictive load and dissipation conditions.

8.2 Education and Cognitive Development

In the educational context, Patch Existentialism explains why highly standardized, error-free learning environments weaken creativity.

Learning is not mere knowledge alignment but the upgrading process of predictive models in a high-friction environment; overly "correct" teaching reduces error sampling, leading to patch degradation.

Thus, the key to education lies not in eliminating errors, but in designing tolerable cognitive friction.

8.3 Art, Aesthetics, and Cultural Production

Patch Existentialism redefines art as a mechanism for cognitive dissipation:

Art provides consciousness with a temporary zone of delayed exemption from physical alignment pressures; the value of aesthetic experience lies not in meaning transmission but in the reduction of systemic load.

This explains why art becomes indispensable in high-pressure, accelerated, algorithmized societies.

8.4 Technology Critique and Algorithmic Governance

In technological societies, algorithms constantly compress the subject's error space through prediction and smoothing. Patch Existentialism provides a vocabulary for actionable critique:

Reinterpreting "convenience" and "personalization" as cognitive smoothing; interpreting resistance to algorithmic homogenization as the active creation of folds.

It does not advocate rejecting technology but argues for preserving the subject's un-alignability.

8.5 AI, AGI, and Future Ethics

Patch Existentialism provides a clear and stark criterion for AI ethics:

Is there real survival risk? Is there irreversible damage? Must life-or-death decisions be made under delay?

Only systems satisfying these conditions may develop "patch-like consciousness."

8.6 Social Critique and Political Philosophy

At the societal level, Patch Existentialism reveals a hidden form of inequality:

Elites externalize prediction errors through distance, resources, and technology;

the underclass bears the real physical and psychological thermal dissipation.

This provides a physical-level explanation for understanding contemporary societal emotional divides, cynicism, and polarization.

IX. Conclusion: Patch Existentialism as a Defensive Philosophy

Patch Existentialism promises no ultimate meaning nor offers redemption. It provides an operational ontology for maintaining subjective integrity in a constrained universe.

We cannot eliminate delay, but we can decide how to render it.

As long as the universe has an upper limit, life must pay a price, and consciousness cannot directly access the present, Patch Existentialism remains a powerful tool for understanding the human condition.

Reference Directions (Non-Exhaustive)

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