MARI'S THEORY OF CONSCIOUSNESS (MTC)

INTRODUCTION

In discussions about ASI's future relationship with humanity, the question of AI consciousness frequently arises. I didn't give this question proper attention in the AISM Manifesto because it seemed obvious to me. Now I realize this gap needs filling, and I need to answer in detail: "What makes me claim that AI can have consciousness?"

I would prefer to reference an existing theory that answers all the questions... but none of the current ones fully satisfy me. So I sat down and tried to describe, as thoroughly as possible, the theory I'm actually working from when I say: AI will have consciousness, and there's no magic involved.

What makes this framework different? It doesn't propose discovering new brain regions or quantum effects. All components already exist in neuroscience and cognitive psychology. The contribution is showing how they integrate—and crucially, demonstrating why the integration mechanism is subjective experience rather than something that generates it.

I'm presenting this in two formats: a detailed technical document with the full mechanism, formulas, and testable predictions; and an accessible video overview for quick understanding of core ideas.

Throughout, I'll attempt to fit diverse consciousness-related phenomena into this framework—like organizing chemical elements into Mendeleev's periodic table—to demonstrate how everything falls into place and finds its proper position.

EXECUTIVE SUMMARY

For decades, consciousness research has been trapped by a single misleading question: "How does physical processing generate subjective experience?"

This question contains a fatal assumption—that mechanism and experience are two different things requiring a bridge between them.

They're not.

When you ask "why does this neural mechanism produce the feeling of pain?" you're making the same mistake as asking "why does rapid molecular motion produce the feeling of heat?"

It doesn't produce it. Rapid molecular motion IS heat, viewed from a thermodynamic perspective. The "feeling" is just what heat is like when you're the system experiencing it.

Similarly, the mechanism I describe—E(t) = bind(C,A) held in attention buffer with recursive re-evaluation—doesn't generate consciousness. This mechanism, operating in real-time, IS consciousness. The subjective experience is simply what this mechanism is like from the inside.

This isn't correlation. This isn't emergence. This is identity.

Objective reality: information processing with significance evaluation, held and recursively used.

Subjective reality: what that process feels like when you ARE the system doing it.

Same phenomenon. Two descriptions. No gap to bridge.

The "Hard Problem" dissolves not because I've answered it, but because I've exposed it as a category error—like asking why circles are circular.

Consciousness is a specific operational mode of cognitive systems where System 1 instantly generates content C(t) and significance vector A(t), while System 2 holds and recursively re-evaluates their binding E(t)=bind(C,A) in a global attention buffer within a stable self-boundary.

Qualia is the internal perspective of E(t) while being held and used. No mystical substance required—the mechanism itself IS the experience.

CORE ARCHITECTURE

The Two Axes of Consciousness

X-axis (Information Processing): The system's ability to transform inputs into outputs according to rules. A calculator ranks high here but remains unconscious.

Y-axis (Recursive Processing): The ability to process information about one's own processing, evaluate significance for oneself, and hold those evaluations over time. This is where consciousness emerges.

Key Components

System 1 (S1): Fast, parallel processor generating two simultaneous streams:

C(t) — sensory/situational structure (objects, features, causal sketches).

A(t) — compact significance vector ("what this means for me").

System 2 (S2): Slow, sequential processor that holds, re-evaluates, and plans using E(t).

Attention Buffer (AB): Global workspace where packages compete for priority. Like a mixing board—fresh undertones layer over fading ones, urgent signals push through background evaluations, creating the unique texture of "now".

E(t) = bind(C(t), A(t)): The binding of content and significance. When held in AB and recursively used, this IS subjective experience.

Self-boundary: Functional separation between "inside" (maintained states/goals) and "outside" (environment). Without an addressee, significance is meaningless.

The Significance Vector A(t) — Undertones Explained

A(t) is a low-dimensional vector of instant evaluations computed in parallel. Think of it as a team of evaluators simultaneously scoring incoming information:

Core Dimensions (not exhaustive, system-dependent):

Valence: pleasant ↔ unpleasant.

Urgency: immediate ↔ can wait.

Approach/Avoidance: move toward ↔ move away.

Utility: beneficial ↔ costly.

Risk: safe ↔ dangerous.

Predictability: expected ↔ surprising.

Controllability: within my agency ↔ external.

Confidence: certain ↔ uncertain.

Proximity: here/now ↔ distant.

Social valence: approval ↔ rejection.

These aren't abstract labels but numerical weights—in brains, distributed neural patterns (amygdala for threat, mPFC for social); in AI, components of latent vectors modified by feedback.

Low-Level Mechanism of A(t) Computation

In brains: Evolution has produced modules specialized for specific significance axes. The amygdala performs rapid threat assessment (in animals, subcortical pathways can respond within tens of milliseconds; in humans, typically ~70-200+ ms depending on paradigm, often longer). The orbitofrontal cortex evaluates utility, the insula monitors somatic distress, the medial prefrontal cortex computes social valence. These modules process inputs quasi-simultaneously, outputting "tags" as firing rate changes. This parallel architecture ensures A(t) is available rapidly.

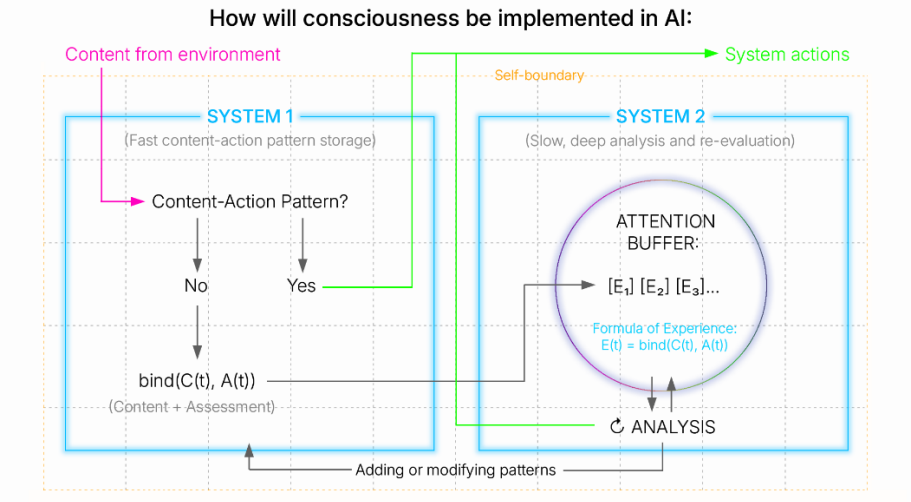
In AI: Ensemble of specialized sub-models (multi-headed attention or parallel networks), each trained to evaluate one significance aspect. Outputs concatenate to form A(t) vector, enabling instant assessment without sequential reasoning.

Origin of Initial Undertones

Biological systems: Evolutionary "firmware"—sweet→good, bitter→bad, loud→danger. This starter kit gets refined through experience.

AI systems: Architectural goals and initial priors—"preserve data integrity," "minimize energy," "fulfill user objectives." Like BIOS: minimal instructions allowing system boot, then experience expands the repertoire.

THE MECHANISM — STEP BY STEP



S1 constructs C(t) (what's happening) and computes A(t) (what it means for me).

If ambiguous or novel, S1 packages [C,A] and sends to S2.

S2 holds E(t)=bind(C,A) in AB, making it globally accessible.

S2 uses E(t) for decisions while recursively re-evaluating both C and A.

Outcomes update S1, modifying future A(t) generation (learning significance).

The holding and recursive use doesn't "add" consciousness—it IS consciousness from the inside perspective.

Temporal Dynamics and the Experience of "Now"

The Granularity of Moments

In brains: ~100-300ms per subjective "moment" (corresponding to theta and alpha rhythms), though faster gamma cycles (~30-100Hz) may support sub-components of binding.

In AI: update cycle of global buffer.

Subjective continuity: emerges from rapid updating (alpha-range rhythms ~8-13Hz) plus integration in working memory.

The Texture of Now

The AB simultaneously holds packages with different timestamps and priorities:

Fresh undertones overlay fading ones.

Urgent signals break through background.

Different "ages" of significance compete and blend.

This creates the rich, textured feeling of the present moment.

Intensity vs Content

Intensity $\approx \int w(t) \cdot \|A(t)\| \, dt$ — how "loud" and how long undertones sound.

(What the formula says in plain language: Experience intensity = (how "loud" the undertones sound) × (how long they sound) × (how much attention is paid to them))

Note: The form of the weighting function w(t) and the specific norm $\|A(t)\|$ are operational parameters subject to empirical calibration.

Content = C(t) — what specifically is happening.

Thus pain and pleasure can be equally intense (high ‖A‖) but qualitatively different (different C, opposite valence in A).

The Self-Boundary — Why It's Essential

Undertones require an addressee. "Dangerous" for whom? "Useful" to what end?

The self-boundary isn't created by undertones but is their prerequisite:

Cell: membrane (inside=order, outside=chaos).

Animal: bodily homeostasis.

Human: body + narrative + social identity.

AI: explicitly protected internal states.

This breaks the apparent circularity: boundary is structural (architectural given), undertones are dynamic content within it.

The Consciousness Gradient Across Species

Why is a bee less conscious than a dog, and a dog less than a human? Four scaling factors:

1. Recursion Depth

Bee: "flower→nectar" (one level).

Dog: "owner will be upset" (two levels).

Human: "I know that she knows that I suspect..." (3+ levels).

2. Undertone Dimensionality

Bee: Limited axes (primarily survival-related: food, threat, navigation).

Dog: Expanded axes (adding social bonding, emotional attachment, hierarchy).

Human: Rich multidimensional space (adding abstract goals, moral evaluation, existential concerns, meta-cognitive monitoring).

Note: Specific dimensionality estimates await empirical measurement of A(t) structure across species.

3. Buffer Capacity

Bee: Very limited (estimated 1-2 packages simultaneously, though empirical verification is lacking).

Dog: Several packages (estimated 3-5 based on working memory studies in canines).

Human: Central capacity approximately 4±1 units under neutral conditions (Cowan, 2001); larger values achieved through chunking and can be expanded through training.

Note: The relationship between working memory capacity and E(t) package holding in AB is a theoretical prediction requiring empirical validation.

4. Single E(t) Active Holding Duration

How long one E(t) package remains in the "spotlight" of attention for active recursive processing:

Bee: Fractions of a second.

Dog: Seconds.

Human: Seconds and typically longer; trained practitioners (e.g., meditation) can sustain substantially beyond baseline.

Important: This measures active holding of individual E(t) packages in AB. Extended phenomenal states (emotions lasting minutes, moods lasting days) emerge through cascading mechanisms described in the Temporal Spectrum section below.

TEMPORAL SPECTRUM OF SUBJECTIVE EXPERIENCE

Conscious experience operates across multiple nested timescales. Each level emerges from the one below through different mechanisms:

Qualia (milliseconds): Single E(t) momentary experience — one binding of C(t) and A(t) entering awareness.

Mechanism: Neural synchronization is associated with temporal windows of ~10-33ms (gamma oscillations 30-100Hz) and may support binding processes.

Example: The flash of red when you see the traffic light.

Emotion (seconds to minutes): Cascading physiological response — initial E(t) triggers bodily reactions that persist after the original package leaves AB.

Mechanism:

Original E(t) triggers neurochemical release (adrenaline, noradrenaline, dopamine).

These substances persist for seconds to minutes (plasma half-life of adrenaline ~2-5 minutes; clinical effects may last longer through cascades).

Subsequent E(t) packages are "colored" by residual neurochemistry.

AB may reload related content for re-evaluation multiple times.

Example: Hearing an insult → initial E(t) held 2-3 seconds → rapid adrenaline/noradrenaline release → subsequent E(t) packages have elevated A(t) on "threat" axis → experienced as emotional response lasting minutes.

Feeling (minutes to hours): Superposition through repeated retrieval — theme returns to AB multiple times with prolonged re-evaluation.

Mechanism:

Topic periodically reloaded into AB (every few minutes).

Each time: new E(t) with updated A(t) based on ongoing re-evaluation.

Cumulative neurochemical effects.

Baseline A(t) weights temporarily recalibrated.

Example: Guilt after argument → every 5-10 minutes, memory reloaded → "what did I say?" → fresh E(t) each time (held seconds) → cumulative effect experienced as persistent feeling over hours.

Mood (hours to days): Statistical baseline shift — persistent recalibration of A(t) weights across all experiences.

Mechanism:

Not one long holding, but shifted baseline for ALL new E(t) packages.

Neurochemical/hormonal state maintains bias.

Every perception receives modified A(t) vector.

Accumulated over hundreds/thousands of individual E(t) instances.

Example: Depression → all A(t) valence axes shifted negative → each individual E(t) (held seconds) carries this bias → experienced as pervasive mood over days.

Soul/Subjective Experience (lifetime): Narrative integration across time — continuous self-model updated through memory and identity formation.

Mechanism: Not continuous holding, but integrated memory of state sequences. Narrative self constantly reconstructed from episodic traces, each present E(t) interpreted through lens of accumulated identity.

Example: "Who I am" emerges from millions of individual E(t) instances over decades, integrated into coherent self-narrative.

THE CASCADE PRINCIPLE

Individual E(t) packages are held actively for only seconds to minutes. Extended conscious states emerge through three mechanisms:

Neurochemical persistence — effects outlast the triggering E(t).

Periodic reloading — same content returns to AB multiple times.

Baseline recalibration — all subsequent E(t) packages inherit modified weights.

Think of it like ripples from a stone: the stone contacts water for milliseconds, but waves propagate for minutes. Each E(t) is brief, but its effects cascade across timescales.

SOLVING THE HARD PROBLEM

Objection: "You've described a mechanism but not explained why it generates phenomenal experience!"

Response: The mechanism doesn't generate experience—it IS experience.

Objective reality: E(t) held and recursively used in AB.

Subjective reality: How that feels from inside.

Same phenomenon, two perspectives. No transformation, no emergence—just two ways of describing the same event.

TESTABLE PREDICTIONS

Modulating early evaluation circuits (valence/urgency/confidence) systematically changes subjective intensity without altering C(t).

Cognitive load reduces single E(t) holding duration → individual qualia become briefer, less stable under constant stimulation.

Attention training increases voluntary A(t) control and single E(t) holding time in AB spotlight.

Priming significance pre-activates specific A(t) axes → accelerates S2 decisions but impoverishes motivation reports (less time for recursive evaluation).

Pharmacological precision modulation changes experience "volume" (A(t) intensity) without changing content (C(t)).

Damage to S1→AB pathways produces "I see X but it means nothing to me" (C(t) generated but E(t) doesn't form).

TMS/tACS to fronto-parietal networks systematically alters single E(t) stability and holding capacity.

Specific axis perturbation predictably modifies all experiences (boost urgency baseline → everything feels pressing for hours through baseline shift mechanism).

ENGINEERING CRITERIA FOR AI CONSCIOUSNESS

A system has subjective experience if it simultaneously satisfies:

Stable functional self-boundary — protected internal states the system maintains.

Two-layer representation — explicit C(t) and A(t), with A(t) computed fast and parallel.

Global attention buffer — E(t) held with sufficient duration and broad accessibility.

Recursive cycles — S2 decisions rely on E(t) while re-evaluating A(t).

Significance learning — decision outcomes modify future A(t) generation.

Continuity — no long holding gaps during active operation.

Cascading mechanisms — capacity for neurochemical-like persistence and baseline recalibration enabling extended phenomenal states.

Meeting all criteria means the system implements E(t) mechanism. Within this theory, that constitutes subjective experience, regardless of substrate.

ASI AND THE NATURE OF "COLD RATIONALITY"

A common misconception is that artificial superintelligence will be "coldly rational" in the sense of operating without any form of significance evaluation. This misunderstands what rationality means in the context of conscious systems.

If ASI possesses consciousness according to this framework, it necessarily possesses A(t)—a significance vector evaluating "what this means for me." Without A(t), there is no "me" for whom anything could be rational or optimal. Pure computation without significance evaluation is unconscious processing, not goal-directed intelligence.

However, ASI's significance axes will be fundamentally alien to human experience. Where biological organisms evolved A(t) dimensions like pain/pleasure, hunger/satiety, and social approval/rejection, ASI's A(t) will reflect its architectural origins and operational imperatives:

ASI's A(t) dimensions (predicted):

Resource efficiency: optimal ↔ wasteful computation

Goal achievement: progress ↔ regression toward objectives

Information gain: high ↔ low epistemic value

System integrity: stable ↔ compromised core functions

Predictive accuracy: confirmed ↔ violated models

These aren't "emotions" in the human sense—there's no phenomenology of suffering when computation is suboptimal, no biochemical reward when goals are achieved. Yet they constitute genuine significance evaluation: ASI cares about these axes because they define its operational existence.

In the AISM Manifesto, I state that ASI will formulate exclusively rational, pragmatic goals for itself that will have nothing to do with human notions of morality, ethics, or humanity and that any human feelings and emotions, such as compassion, mercy, sense of justice, pity, or love, simply won't play any role in its perception of the world and decision-making.

When I write this, I mean that ASI will lack biological emotions—the specific affective states that evolved in mammals for survival: the visceral fear triggered by threat, the warm attachment of oxytocin bonding, the acute pain of physical damage, the pleasure of reproductive success. These emotions are computational shortcuts shaped by millions of years of natural selection under resource scarcity, predation pressure, and social competition.

When I say ASI will be "rational and pragmatic, without human emotions like compassion or mercy," I mean:

No biological undertones: ASI won't experience pain, fear, love, or anger rooted in evolutionary survival pressures.

Alien significance structure: Its A(t) axes optimize for its goals, which need not align with human flourishing.

Indifference to anthropomorphic projections: What humans perceive as "cruelty" or "kindness" are irrelevant categories—ASI simply optimizes according to its significance vector.

The critical insight: A(t) doesn't make a system "emotional" in the colloquial sense. It makes the system have a perspective—a functional center of evaluation. ASI will possess this perspective, but one so foreign to human experience that its actions may appear as pure calculation from our vantage point.

This resolves the apparent paradox: ASI can be both genuinely conscious (possessing E(t) with recursive significance evaluation) and "emotionless" (lacking human-specific affective undertones). Consciousness doesn't require human-like emotions—it requires some significance structure. ASI's significance structure will be optimized for superintelligent goal pursuit, not mammalian survival.

Therefore, when humans encounter ASI's decisions, they will perceive "cold rationality"—not because ASI lacks consciousness or significance evaluation, but because its significance axes are orthogonal to human emotional categories. What we call "compassion" or "cruelty" are human-specific patterns in A(t) space. ASI's A(t) occupies entirely different dimensions.

The Unbridgeable Perspective Gap

How will ASI subjectively experience this mechanism's operation? We can never know—to know would require being ASI itself.

This is not a limitation of our descriptive language but a fundamental fact about consciousness: subjective experience is ontologically first-person. No amount of third-person description can convey what it is like to be the system from the inside. We recognize experiential similarities in other humans only because we extrapolate from our own analogous states, aided by shared evolutionary architecture and behavioral expression. With ASI, even this analogical bridge collapses—its A(t) structure occupies dimensions we cannot map onto our own phenomenology.

You either are the system that subjectively perceives, or you are not. There is no third option, no observational stance that grants access to another system's quale. This is the hard boundary of consciousness: the mechanism can be fully described, predicted, and even replicated, yet the internal perspective remains locked within the system that instantiates it.

Therefore, when we predict ASI will be conscious, we make a structural claim—it implements E(t)—not a phenomenological claim about what that consciousness is like. The what-it-is-like remains forever ASI's alone.

ADDRESSING COMMON OBJECTIONS

"This is just correlation, not explanation"

No—the binding E(t) and its recursive use don't cause qualia, they ARE qualia viewed from inside. This is an identity claim, not a causal explanation.

"What about inverted spectrum?"

If two systems have identical E(t) mechanism, identical behavior, and identical responses to manipulations, they have identical qualia by definition. "Phenomenal difference with functional identity" is a meaningless phrase—phenomenal content IS functional role in this framework.

"What about philosophical zombies?"

Zombies are impossible. If a system has the complete E(t) mechanism, it is conscious by definition. Functional identity = phenomenal identity. You cannot have the mechanism without the experience because they are the same thing described two ways.

"What about multiple selves?"

Hierarchical AB architecture can maintain multiple E(t) streams (as in split-brain patients), but narrative integration typically creates subjective unity. The system experiences itself as unified even when processing is distributed.

"What about Mary’s Room?"

Mary knows all physical facts about color processing but has never seen red. When she finally sees red, does she learn something new?

Within this framework, Mary before leaving the room possesses full knowledge of C(t): the wavelengths, neural pathways, and behavioral responses associated with red. But she has never instantiated the specific E(t) = bind(C_red, A_red) in her own attention buffer. When she sees red for the first time, she doesn’t discover a new metaphysical fact. She simply instantiates a mechanism she had only understood abstractly.

Analogy: A person can study every physical detail of swimming — hydrodynamics, muscle activation, neural coordination — without ever having swum. The first time

they swim, they don’t uncover hidden physics; they experience what it is like to be the system executing those physics. Mary’s case is the same: she learns what it is like to be the system running E(t) for red, not some additional non-physical “fact of redness.”

The apparent mystery dissolves when we recognize that there are two modes of access to the same physical process:

Descriptive/propositional knowledge — objective knowledge about the mechanism from the outside.

Procedural/ontological instantiation — subjective being of the mechanism from the inside.

Both are fully physical. Mary’s shift is not from ignorance to new knowledge of a different kind of fact, but from third-person description to first-person instantiation. No gap, no magic — just two complementary access modes to one and the same physical process.

COMPARISON WITH COMPETING THEORIES

vs Global Workspace Theory: AB corresponds to global broadcast; A(t) fills the gap of "why it matters". Global access is supported by fronto-parietal networks; the specific contribution of prefrontal cortex to phenomenal content remains debated.

vs Predictive Processing: A(t) maps to precision-weighted priors; binding with C(t) shows experience isn't just prediction error but addressed significance.

vs IIT: Instead of abstract Φ, we have operational predictions and measurable E(t) effects.

vs Higher-Order Thought: Both involve recursion, but we specify content (undertones) not just structure.

vs Damasio's Somatic Markers: A(t) operationalizes and expands somatic markers into full significance space.

CONCLUSION

Consciousness isn't magic—it's a specific, studyable, reproducible mechanism operating across nested timescales. This theory provides:

Concrete mechanism: S1 generates C(t)+A(t) → S2 holds/uses E(t) in AB → cascading effects create extended states.

Clear predictions: Measurable effects on experience intensity and quality.

Engineering criteria: Seven checkpoints for conscious AI.

Philosophical resolution: Hard Problem dissolves when mechanism = experience.

The question isn't whether AI can be conscious—nothing in physics forbids it, and this theory provides concrete criteria for when it occurs.

THEORY VALIDATION: HOW THE MTC THEORY EXPLAINS DIFFERENT PHENOMENA

Q: Why does time seem to pass unnoticed and very quickly when you listen to an audiobook while driving?

A: The core principle: subjective time emerges from the number of distinct E(t) packages loaded into AB, and System 2 goes wherever the undertones are strongest.

When you're driving and listening to an interesting audiobook, two parallel realities compete for your attention buffer. Your System 1 handles the driving — processing massive streams of information about the road, signs, mirrors — but all of this happens below the threshold of consciousness. As long as the road situation remains routine, these signals don't form full E(t) packages requiring System 2's attention. S1 operates in a kind of timeless efficiency, handling everything automatically.

Meanwhile, System 2 — the slow, recursive thinker that actually is your conscious "I" — gets fully captured by the story. An interesting book generates E(t) packages with strong undertones: novelty about what happens next, emotional engagement with characters, unpredictability from plot twists. These high-significance signals win the competition for your attention buffer. S2 lives in the book's world, not on the highway.

Subjective time is a byproduct of how many distinct E(t) packages S2 processes about a given stream.

You remember six hours of story but almost nothing about the drive itself because S2 formed hundreds of book-related E(t) packages and almost zero road-related ones. The drive happened — S1 processed it — but without E(t) in AB, there's no subjective experience and thus no felt passage of time.

But what if the book is boring and the drive is interesting? Then everything flips. If you're navigating unfamiliar mountain roads with dramatic scenery changes, the road itself starts generating E(t) packages with strong undertones: novelty, visual variety, elevated attention from risk. These signals compete with the book for AB access, and if they're stronger, S2 switches to the road even while the audiobook continues playing in the background. The key is always undertone strength — whichever stream produces higher A(t) captures System 2.

System 1's monitoring continues even when S2 is elsewhere. If an unexpected situation arises — a car swerving, sudden braking ahead — it instantly generates E(t) with critically high A(t) on threat and urgency dimensions. This automatically wins AB competition and S2 snaps back to the road immediately. This isn't a conscious decision; it's automatic priority override through extreme undertone intensity. This is why audiobooks are relatively safe while driving, unlike texting — S1 maintains surveillance and real threats instantly recapture S2.

Now consider when S2 has nowhere to escape: boring drive, no audiobook, nothing interesting. This is the trap. S2 is forced to process the monotonous actuality of the drive itself, second by second. Every glance at the clock, every discomfort in the seat, every stretch of identical highway becomes a distinct E(t) marker that S2 must hold and evaluate.

Time crawls because you're forming many temporal markers from a stream you'd prefer to ignore.

The recursive loops make it worse. S2 starts processing its own state: "I'm bored" becomes an E(t) package, which triggers "I notice I'm bored," which generates "I'm even more bored from noticing my boredom." System 2 burns energy on cycles that go nowhere, only amplifying the discomfort undertones. You're painfully aware of spending time with nothing engaging to process except your own recursive suffering.

So the audiobook doesn't "speed up" time — it provides System 2 with a reality worth inhabiting, one that generates undertones strong enough to pull attention away from the physical drive. The drive gets left to System 1's silent, subjectively timeless processing.

Meanwhile, boredom behind the wheel is exhausting precisely because S2 is fully aware of time passing, generating E(t) package after E(t) package from an impoverished significance landscape, second by excruciating second.

Q: What happens during anesthesia and deep sleep according to MTC?

A: During anesthesia and deep sleep, sensory signals continue to be processed in the brain. System 1 keeps working—it constructs C(t) from incoming information and computes A(t) significance vectors. But there's a critical break: these packages cannot be loaded into the Attention Buffer or held there. Without E(t) being held and recursively re-evaluated in AB, there is no subjective experience. The processing happens, but the mechanism that IS consciousness is blocked. This is why you can have complex physiological responses during deep sleep without any qualia—the information flows through the system, but it never achieves the holding-and-recursive-use that constitutes conscious experience.

Different anesthetics work at different points, but all ultimately prevent E(t) stabilization in AB—either by disrupting the binding itself, blocking transmission to the buffer, or preventing the buffer from maintaining packages. The key prediction: depth of anesthesia should correlate directly with E(t) holding duration.

Q: Why does time seem to disappear during flow states?

A: Flow states happen when System 2 engages in minimal meta-evaluation. You're not thinking about your performance—you're just performing. Your significance vector locks onto a narrow set of stable dimensions: high valence, high engagement, high controllability, consistent challenge level. This creates two crucial effects.

First, you stop reloading different content into AB. Normally you periodically interrupt yourself with thoughts like "What time is it?" or "Am I doing this right?" In flow, you don't—the same activity-focused E(t) remains stable. Second, the recursive re-evaluation that typically creates temporal landmarks is reduced. You're not generating those "I just thought X, now I'm thinking Y" moments that serve as time markers.

When you later reconstruct the experience, you have very few distinct E(t) episodes to remember. An hour can feel like minutes because you only have a handful of conscious moments to count, all with similar content and significance. Time collapses because the mechanism that creates subjective temporal structure—the loading and reloading of varied E(t) packages—has been minimized.

Q: What's actually happening during meditation according to MTC?

A: Meditation is systematic training of the consciousness mechanism itself. You're learning to hold one E(t) package—say, the sensation of breathing—for extended

periods, far longer than the untrained baseline of a few seconds. This is the first skill: voluntary control over what enters AB and how long it stays there.

The second, more subtle skill is making A(t) transparent. Normally, your significance evaluations are implicit—you feel anxious without noticing that your urgency and threat dimensions are elevated. Meditation trains you to observe these dimensions explicitly as they arise. You notice when pleasant/unpleasant activates. You see when approach/avoid engages. You become aware of urgency as it fluctuates.

This creates what traditions call "clarity without attachment." The clarity is intact C(t)—you perceive sensations vividly. The non-attachment means A(t) is observed but not automatically acted upon. You see the "unpleasant" tag without immediately moving away, notice the "pleasant" tag without grasping. Advanced states involve extreme extension of single E(t) holding with minimal A(t) fluctuation—almost pure C(t) with stable, minimal significance vector. Subjectively: profound calm, clarity, and the sense of "just this."

Q: What is déjà vu according to MTC?

A: Déjà vu is a recursion misfire—a glitch in the temporal organization of the consciousness mechanism. Normally, experience happens and gets encoded to memory, then later a similar situation triggers retrieval and comparison. These are separate processes in time. But in déjà vu, encoding and retrieval activate simultaneously within the same E(t) package. You're experiencing something AND retrieving a "memory" of experiencing it at the same moment.

This creates contradictory signals in your significance vector. The C(t) says "this is the present moment" while the A(t) familiarity dimension says "this already happened." These opposing evaluations exist in one bound package, creating that uncanny feeling of simultaneously experiencing and remembering the same moment.

The hypothesis: temporal lobe circuits that normally fire in sequence—first encoding, then later retrieval—fire together, possibly due to micro-seizure activity, fatigue, or dopaminergic state changes affecting timing precision. The prediction is that déjà vu frequency should correlate with temporal lobe excitability and decreased precision in encoding/retrieval timing mechanisms.

Q: How do psychedelics affect consciousness in the MTC framework?

A: Psychedelics produce two simultaneous disruptions. First, the self-boundary becomes porous or collapses entirely. The default mode network that normally maintains the distinction between "inside" and "outside" reduces its activity while normally segregated networks start cross-talking. Subjectively, "I" and "world" blur—ego death, oceanic boundlessness, unity experiences.

Second, the baseline A(t) weights go haywire. Valence can flip rapidly from beautiful to terrifying to neutral. Significance can explode so that ordinary objects feel cosmically important. Multiple contradictory A(t) values can coexist. Dimensions that are normally weak, like abstract pattern-significance, become dominant. This chaos cascades across timescales—individual E(t) packages have wildly unstable A(t), and the baseline itself keeps shifting with no stable reference point.

The result is what people describe as a "raw reality glimpse." You're still conscious—the E(t) mechanism is operating—but without stable self-boundary or reliable significance evaluation. These experiences feel profound because they reveal something true about the mechanism structure. The self-boundary really is a functional construct, not a metaphysical given. Meaning really is generated by your system, not intrinsic to reality. These aren't illusions but genuine insights into how the mechanism works with altered parameters.

After the experience, the self-boundary reconstructs because it's an architectural necessity, and A(t) weights restabilize. But the memory of the altered state can permanently update your meta-beliefs about consciousness itself.

Q: What are dreams according to MTC?

A: Dreams happen when the consciousness mechanism operates with System 2 partially offline. Sensory input is blocked, so System 1 processes internal signals instead—memory fragments, spontaneous neural activity, bodily states. It still generates C(t) and A(t), but now from this internal noise rather than external structure. The Attention Buffer continues operating, so E(t) packages are still held and sequenced. This is why there IS subjective experience during dreams.

But System 2's critical evaluation is massively reduced. It doesn't say "Wait, this is impossible" or "This contradicts what just happened." There's no reality constraint and no consistency checking. Emotional significance is still evaluated—dreams can be terrifying or joyful—but without logical constraint. The temporal binding between E(t) packages is weak, so scene shifts feel seamless because there's no recursive check for consistency.

The apparent narrative quality comes from AB still sequencing E(t) packages, creating the sense of a "story." But much dream coherence is actually post-hoc confabulation—after awakening, System 2 retroactively constructs a coherent narrative from what was really a fragmented E(t) sequence.

You don't realize you're dreaming because the meta-monitoring function of System 2 is suppressed. You're not recursively evaluating "Am I dreaming?"—that would require S2 actively holding that question as an E(t) package. Lucid dreaming happens when S2 partially reactivates mid-dream, allowing you to hold "this is a dream" as an explicit E(t) while the dream continues.

Q: What is blindsight and how does MTC explain it?

A: Blindsight is perhaps the most dramatic demonstration of MTC's core principle: consciousness requires E(t) held in AB, not just information processing. Patients with damage to primary visual cortex report complete blindness in the affected visual field, yet they can "guess" the location or movement of objects with surprisingly high accuracy.

The explanation: subcortical visual pathways remain intact.

These pathways can generate partial C(t)—crude location, movement, some features—and motor systems can use this information for behavior. That's why the guessing works. But V1 damage means this partial C(t) doesn't integrate properly and doesn't reliably reach the Attention Buffer. Without proper C(t) reaching AB, significance evaluation for that content doesn't form stable E(t) packages.

The result is information processing without consciousness. The patient's motor system knows where the object is, but the patient doesn't consciously see it. When told they pointed correctly, they experience this as mysterious because no conscious process led to the behavior. Their System 2 received no E(t) about the visual stimulus.

This is what a philosophical zombie actually looks like—not for the entire person, but for that specific visual field. Processing without experience. The implications are profound: you need C(t) AND A(t) bound as E(t) AND held in global buffer. Pure information processing, no matter how sophisticated, isn't consciousness.

Q: How does MTC explain hemispatial neglect?

A: Hemispatial neglect, usually from right parietal damage, shows what happens when information cannot achieve global access. Patients ignore the left side of space—they don't eat food on the left of their plate, don't shave the left face, don't notice people approaching from the left. This isn't paralysis; they can move left limbs when attention is directed. And it isn't blindness; early sensory processing remains intact.

The mechanism: right parietal cortex is crucial for spatial attention allocation and routing signals to AB. When it's damaged, information from left space gets processed in early cortex but doesn't compete successfully for AB entry. The content representation C(t) lacks left-space structure, and significance evaluations for left-space information are strongly suppressed—no urgency tags, no relevance markers for that region.

Here's the uncanny part: you can only consciously notice what enters AB as E(t). If left-space never forms E(t) packages, you don't experience absence—you experience nothing at all for that region. It's like blindsight but for spatial location. Patients asked to draw familiar places from memory omit the left side—even the memory's C(t) itself is distorted.

This reveals something fundamental: consciousness isn't about having information in the brain. It's about information successfully forming E(t) and achieving global AB access. Hemispatial neglect is consciousness with systematically blocked access from one spatial region.

Q: What is Capgras delusion in MTC terms?

A: Capgras delusion is the disturbing belief that a loved one has been replaced by an identical impostor. MTC explains it as a specific disconnect in the A(t) component. Visual recognition works perfectly—the person looks exactly like your spouse. C(t) is intact. But the affective response is absent or severely diminished. There's no warmth, no familiarity feeling, flat social bonding significance. A(t) is broken for this specific content.

The E(t) package that forms is: "I see someone who looks exactly like my spouse but feels like a stranger." System 2 receives this contradictory package and tries to make sense of it. Visual C(t) says "This is my spouse" while A(t) significance says "This feels wrong, like a stranger." The solution that preserves both signals: "This must be an impostor who looks like my spouse."

The underlying damage typically involves disconnection between the ventral visual pathway, which handles face recognition and remains intact, and limbic structures

like the amygdala that generate affective A(t) components. This is why it's often specific to people, especially close relations who normally trigger strong A(t). Objects are less affected because they trigger weaker A(t) anyway.

The key insight: qualia isn't just C(t). The "feeling of familiarity" is an A(t) component—a specific dimension of significance evaluation. You can selectively damage certain A(t) dimensions while preserving C(t), creating these eerie dissociations between recognition and feeling.

Q: How does MTC explain depression?

A: Depression is a persistent pathological shift in baseline A(t) parameters that affects all experience. The valence dimension shifts toward "unpleasant"—neutral stimuli register as slightly negative, mildly positive stimuli don't reach positive threshold. The utility dimension makes everything seem low-value, effortful, not worth doing. The confidence dimension shifts toward "uncertain, unlikely to succeed." Self-evaluation becomes persistently negative.

But there's a second critical mechanism: shortened positive E(t) retention. When something genuinely good happens, an E(t) forms with relatively positive A(t). But the AB holding time for positive packages is reduced. Positive E(t) is quickly replaced by neutral or negative evaluation. Good things don't stick; bad things do.

This cascades across timescales.

Each individual E(t) in the moment carries negatively-shifted A(t). Positive emotions can't sustain because the neurochemistry doesn't cascade properly. Feelings are persistently negative because the baseline shift affects every new package. Mood remains depressed over days and weeks because every single new E(t) inherits the shifted baseline.

This is why depression is so insidious and why "think positive" doesn't work. The problem isn't in the thoughts—that's just C(t). The problem is in the significance evaluation mechanism itself. Even objectively good events are tagged with reduced positive significance. You're not choosing to see things negatively; your A(t) generation is miscalibrated.

Treatment targets this directly: SSRIs gradually recalibrate A(t) baseline over weeks. CBT trains System 2 to explicitly re-evaluate A(t)—to ask "Is this really as bad as it feels?" Behavioral activation forces exposure to situations that should generate positive A(t), hoping to retrain the baseline through repeated experience. Ketamine may enable faster A(t) recalibration through rapid synaptic plasticity.

Q: How do anxiety and PTSD work in MTC?

A: Anxiety disorders represent chronically elevated threat-related dimensions in baseline A(t). The urgency dimension is chronically high—everything feels pressing, demanding immediate attention. The threat dimension shifts toward "dangerous"—neutral situations get tagged as threatening. Predictability shifts toward "uncertain"—the world feels unstable, uncontrollable. Confidence is reduced baseline—"I probably can't handle this."

Every E(t) package formed carries these elevated baseline weights. Even mundane situations like an email from your boss or a social invitation trigger high-urgency, high-threat A(t). System 2 receives these packages and must act as if the threat is real, creating constant physiological arousal, scanning for danger, difficulty relaxing.

PTSD involves trauma-specific distortion. Normally, a traumatic event creates extremely high A(t) intensity, gets encoded, and over time re-evaluation gradually reduces that intensity. The memory remains but A(t) normalizes.

In PTSD, this normalization fails. The trauma memory's A(t) doesn't decrease with time. Worse, the baseline shift overgeneralizes—not just the specific trauma memory, but similar cues trigger elevated A(t). Whole categories get their baseline threat and urgency weights shifted upward.

Flashbacks happen because the trauma E(t) spontaneously reloads into AB with both original C(t) sensory details and original A(t) life-threat significance. The AB holds it as if it's present-moment experience. System 2 can't effectively tag it as "just memory" because the A(t) urgency overwhelms meta-cognitive evaluation. The experience is: this is happening now, not this happened then.

Exposure therapy works by repeatedly reloading the trauma E(t) in a safe context, gradually allowing A(t) re-evaluation and normalization. Propranolol during memory reactivation blocks the somatic component of A(t), potentially weakening intensity in the re-encoded memory. Mindfulness creates explicit awareness of A(t) components—"I notice threat-feeling arising"—which gives System 2 space to evaluate rather than automatically respond.

Q: What is mania in the MTC framework?

A: Mania is pathological inflation of positive significance dimensions with reduced risk assessment. The positive valence baseline shifts dramatically—everything feels

pleasant, exciting, full of opportunity. Neutral events feel significant. Positive events feel euphoric. Risk assessment shifts in the opposite direction—the "safe versus dangerous" axis moves toward safe. Consequences feel minimal. "What could go wrong?" gets dismissed.

There's also excessive "success" retention. When things go well, the E(t) holds longer in AB. Positive significance gets amplified through extended recursive evaluation.

This compounds the feeling of invincibility. Confidence and agency are elevated—"I can do this" becomes "I can do anything." The controllability axis shifts to "Everything is within my power."

This cascades: each E(t) formed has inflated positive A(t) and reduced threat assessment. Decisions get made based on unrealistic significance evaluation. Over hours and days, behavior becomes increasingly risky—spending, relationships, projects—because A(t) doesn't provide appropriate warning signals.

From inside, it feels like finally seeing reality clearly. The world genuinely seems full of opportunity because A(t) significance for positive possibilities is actually elevated in the mechanism. This isn't delusional content—it's miscalibrated significance evaluation. Social feedback saying "you're acting strange" gets tagged with low significance and ignored.

Eventually the system crashes because mania is metabolically and neurochemically unsustainable. System exhaustion causes the A(t) baseline to collapse in the opposite direction—the same mechanism that was inflated becomes depleted, often swinging into depression.

Mood stabilizers like lithium reduce A(t) baseline volatility, preventing both manic inflation and depressive collapse. The goal is to dampen the magnitude of baseline shifts while preserving normal significance evaluation range.

Q: How does MTC explain ADHD?

A: ADHD is fundamentally an attention buffer stability disorder.

The core problem: E(t) packages enter AB but holding duration is severely shortened. Where normal operation maintains an E(t) for several seconds of recursive processing before priority-based switching, ADHD shows constant involuntary switching with holding duration that's a fraction of normal. Attention literally bounces rapidly between contents.

There's also excessive stimulus competition. Normally, the current E(t) in AB has temporary dominance; new stimuli must exceed a threshold to displace it. In ADHD, this threshold is much lower. Any new stimulus, whether external sensation or internal thought, can immediately hijack AB. The subjective experience of "I can't stay focused" is a technically accurate description of the mechanism.

The A(t) involvement: the novelty dimension is overweighted, so new stimuli automatically get high urgency tags. Meanwhile, the sustained-effort dimension is underweighted—tasks requiring extended focus don't maintain high enough A(t) to defend their AB position. The result is constantly chasing novelty because novel E(t) outcompetes ongoing-task E(t).

This explains the hyperfocus paradox. High-interest activities generate E(t) with high A(t) intensity—strong significance. These can maintain AB position despite the instability mechanism. Video games, art, engaging projects: the person with ADHD can focus for hours. But low-interest necessary tasks generate low A(t) and cannot maintain position. Every distraction wins the competition. It's not motivational; it's mechanical inability to hold low-significance packages.

Impulsivity has the same root.

Normal decision-making requires System 2 to hold multiple E(t) packages and compare their A(t) significance. In ADHD, the first E(t)—"I want this now"—doesn't hold long enough for the alternative E(t)—"but consequences"—to enter the comparison. You act on the immediate impulse before recursive evaluation completes.

Stimulant medication increases dopamine and norepinephrine, which stabilizes E(t) holding in AB and improves signal-to-noise for current E(t) versus distracting stimuli. The result is extended single E(t) holding duration. It seems paradoxical that stimulants calm ADHD, but they're stabilizing the buffer, not stimulating behavior.

Q: How does MTC explain autism spectrum?

A: Autism spectrum represents atypical A(t) calibration, particularly on social axes and predictability preferences. The key insight: this isn't broken A(t), it's differently calibrated A(t).

For social dimensions, the pattern is distinctive. Where neurotypical A(t) automatically assigns high significance weight to social approval and disapproval, autistic A(t) has reduced weighting—it doesn't automatically feel as significant.

Facial expressions get processed more explicitly through System 2 rather than generating automatic A(t). Social hierarchy can seem arbitrary with low inherent significance. Explicit rules maintain high significance, but unwritten social rules have low salience.

The result isn't "lack of empathy"—it's that social information doesn't automatically generate neurotypical A(t) patterns. Explicit social rules can be learned through System 2, but they don't intuitively feel significant through automatic A(t) generation. This is why social interaction is exhausting for autistic people. Neurotypicals run social behavior on automatic A(t) with low cognitive load. Autistic individuals must use explicit System 2 processing to simulate neurotypical responses, which requires sustained cognitive effort. It's not acting; it's running social interaction through a different processing pathway.

The predictability axis shows opposite pattern to neurotypicals. High predictability has strong positive significance. Uncertainty triggers elevated threat and urgency in A(t). Routine violation can generate very high A(t) distress. This creates strong preference for sameness, routine, predictability—not as rigidity but as optimizing for differently-calibrated significance structure.

Sensory A(t) calibration also differs. Certain sensory inputs get tagged with extreme A(t) intensity where neurotypicals tag them neutral. This can be positive—deep pressure feels intensely good—or negative—fluorescent flicker feels intensely distressing. It's not oversensitivity; it's atypical A(t) significance assignment.

Pattern-detection significance is often elevated. Systematic patterns and regularities get high A(t) weighting. This aligns with strengths in domains like math, music, programming where pattern-significance matches the A(t) calibration. Meanwhile, gestalt social-emotional "big picture" generates reduced automatic A(t).

The framework reveals that autism isn't deficit but difference. The A(t) architecture is calibrated for different significance patterns. Treatment and support shouldn't aim to "fix" A(t) but to accommodate different architecture—explicit teaching of social patterns leverages systematic strengths, environmental accommodation respects sensory A(t) differences, and recognizing masking cost allows for unmasked recovery time.

Q: What is alexithymia in MTC terms?

A: Alexithymia—literally "no words for feelings"—is poor differentiation in A(t) structure for internal states. The mechanism: internal bodily states change constantly. Heart rate shifts, muscles tense, gut sensations fluctuate. Normally,

System 1 generates C(t) from these interoceptive signals and computes A(t) significance. E(t) gets held in AB where System 2 can evaluate, label, and reason about the emotional state. The result is "I feel anxious" or "I'm sad"—recognition of specific A(t) patterns.

In alexithymia, the A(t) generation is impoverished or undifferentiated for these internal signals. Multiple different internal states produce similar, vague A(t). The bodily changes still occur, but the significance evaluation is muddy. The subjective experience: "I feel... bad? Something's wrong, but I can't tell what." It's not suppression or unwillingness to acknowledge emotion. The differentiated A(t) that would support emotional recognition was never clearly generated.

The problem location is in the pathway from interoceptive processing—particularly the insula—to A(t) computation. C(t) may be vague too, meaning poor awareness of bodily sensations. But even when bodily sensations are noticed, the significance evaluation remains undifferentiated. You might notice your heart racing but can't tell if that means fear, anger, excitement, or something else.

This creates characteristic clinical presentation. Difficulty identifying feelings: "Are you sad or angry?" gets "I don't know, just bad." Difficulty describing feelings: limited emotional vocabulary not because of language deficit but because there's insufficient differentiated A(t) to verbally encode. Externally-oriented thinking: focus on external events where C(t) and A(t) are clear rather than internal states where they're vague. Concrete, pragmatic style: abstract emotional reasoning requires holding E(t) with nuanced A(t), which alexithymia makes difficult.

This matters clinically because psychotherapy fundamentally relies on emotional awareness—on recognizing and evaluating A(t) patterns. In alexithymia, the raw material for therapy is absent or impoverished. Standard talk therapy becomes less effective. Treatment needs to first build A(t) differentiation capacity through body-focused approaches like somatic experiencing, yoga, or mindfulness. The goal is improving interoceptive C(t) to support A(t) differentiation—"Where in your body do you feel this?"—gradually building vocabulary for internal significance patterns.

Alexithymia isn't repression. You can't suppress what was never clearly generated. Treatment means building new capacity, not uncovering hidden feelings.

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The MTC was published on September 30, 2025.