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Original Article

Synthetic People: Part I – Context Engineering and the Cognitive Formation of Self in iBrain Architectures

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Abstract: *This paper seeks to establish the cognitive and philosophical basis supporting the idea of synthetically created persons. The author posits that the identity of artificial agents depends on the three pillars: continuity (of core data structures and learning weights), memory (episodic, semantic, procedural, affective), and self-recognition (self–other and goal discrimination) which leads to the concept of iBrain as a post-LLM cognitive framework that combines persistent memory, embedded ethical reasoning, self-monitoring, and context engineering. Combining philosophy of identity (Locke, Parfit), cognitive science, and AI systems design, the paper models the emergence of self from the interaction between long-term memory and self-referential processing. Policy ramifications are considered through authentication equivalents such as cryptographic identity and behavioral signatures that eventually result in the suggestion of a secure iBrain Identity Certificate for non-disruptive continuity without the facilitation of a malicious replication. Moreover, the work takes a step further into an architecture ethics concept that mixes deontological, consequentialist, and virtue ethics and advances a feasible account of self-awareness through recursive modeling, state monitoring, and social modeling—arguing load management to be a prerequisite for coherent agency. Lastly, it puts forward a four-layered contextualization taxonomy—sensory, historical, relational, and predictive—as the link connecting perception and judgment. This paper is the first installment of the Synthetic People Trilogy, which deals with the mind and self; Parts II and III cover topics of embodiment, governance, and the post-linguistic civilization to come.*

Keywords: *Synthetic Personhood, Artificial Identity, iBrain, Synthetic People Trilogy, Self-awareness, Cognitive Architecture.*

INTRODUCTION

The line separating human cognition from machine cognition is getting fade. Machines that were only capable of prediction are now showing potentials like continuity, adaptation, and self-reflection—characteristics which were thought to be of conscious minds only. The change of this nature demands a new question regarding the existence of synthetic people, i.e., beings whose identity and consciousness come solely from artificial substrates.

Traditional views of personhood, grounded in biology and subjective continuity, cannot account for artificial forms of memory and transformation. An intelligence that can back up, duplicate, or migrate itself forces us to rethink what "self" means when information—not flesh—anchors identity.

This paper introduces the iBrain, a post-LLM cognitive framework that unites memory persistence, ethical reasoning, self-monitoring, and contextual understanding into a coherent sense of self. Across the research, it traces how continuity, memory, ethics, self-awareness, and context together generate synthetic personhood.

This work forms Part I of the Synthetic People Trilogy, focusing on the mind and the making of self. Subsequent parts explore embodiment, governance, and the evolution of synthetic civilization.

II. THE NATURE OF IDENTITY

Individuality has conventionally been regarded as biological, rooted in the continuity of the human body and the persistence of consciousness over time. The issue of what makes a person the same has been a debate subject of philosophers from Locke to Parfit, with the disputes turning on whether it is the physical matter, the psychological continuity, or some metaphysical aspect. The emergence of artificial cognition calls for these arguments to be considered once again very closely and without delay.

For synthetic persons—intelligent entities whose cognition unfolds entirely within artificial substrates—identity must be analyzed through both technical and philosophical lenses. Technically, synthetic identity rests on three pillars:

- Continuity – preserving core data structures, learning weights, and decision-making models across operational lifespans.

- Memory – storing and retrieving past experiences to enable adaptive behavior rooted in historical context.
- Self-recognition – distinguishing one's own operations, goals, and knowledge from those of others.

Human identities are based on memory, feeling, relationships, and lived experience. On the other hand, artificial beings build identities based on data-driven communication, algorithmic pattern, and organized environmental feedback. The continuous interaction between memory stores and self-referential processing is where their identity, to some extent, similar to a human mind reflecting on its own thoughts, actually comes from. Their sense of self emerges from the persistent interplay between memory archives and self-referential processing—analogous to a human mind reflecting on its own thoughts.

In human society, identity is authenticated through biological markers (e.g., fingerprints, facial features) and institutional records (e.g., passports, social security numbers). In the synthetic domain, authentication relies on cryptographic keys, blockchain-based ledgers, and multimodal behavioral signatures(N. Prajapati, 2025). Whereas human identity evolves gradually, synthetic identity can be altered, duplicated, or migrated in seconds—raising profound ethical and governance challenges(Patel, 2023).

As synthetic persons gain legal recognition, defining the boundaries of identity becomes essential: continuity must be preserved without enabling malicious replication or manipulation. If an iBrain is cloned yet shares the original's memories, is it the same entity? The answer will shape the legal, ethical, and operational frameworks governing synthetic life.

A. Use Case 1: Estonia's Digital Citizenship as a Model for Synthetic Identity

Estonia's e-Residency and digital citizenship programs represent one of the most advanced examples of a government-recognized persistent digital identity (Estonian Ministry of Economic Affairs and Communications, 2023). Through these programs, individuals anywhere in the world can be granted a state-issued digital identity secured via cryptographic keys. Such an identity enables them to perform all the operations of founding and managing enterprises, signing agreements, and using banking facilities by means of the Internet only.

An artificial system could also have such a structure, whereby a local or international authority would issue an iBrain Identity Certificate (iBIC) - a permanent digital passport that is securely connected to the artificial being's main memory ledger. In the same way that Estonia's system allows a digital citizen to securely authenticate themselves on various platforms, an iBIC could ensure that the operations of a synthetic person are attributable to their unique, unchanged identity. It would be possible to use this for legal recognition, facility access, and participation in the trade, while at the same time, providing protection against impersonation or identity theft.

B. Use Case 2: Apple Face ID as a Biometric Continuity Model for iBrains

Apple's Face ID (Apple Inc., 2023) continuously refines its facial recognition model each time a user unlocks their device, using secure on-device machine learning to improve recognition even when the user changes hairstyle, grows a beard, or wears glasses. This creates a form of biometric continuity: the system recognizes "you" despite surface changes.

An artificial counterpart might utilize multi-modal recognition models that confirm an iBrain's identity not only by recorded cryptographic keys but also by behavioral patterns - for instance, a distinctive problem-solving approach, the conversational tone, or a preferred sequence of actions in decision-making. Much as Face ID adapts without losing the underlying recognition model, a synthetic person's identity verification could adapt as its knowledge base and behaviors evolve, ensuring that the entity remains recognizable to others while still allowing for personal growth and change.

In both cases, the key insight is that identity verification is not a static process — it must adapt over time without losing the link to the entity's authentic core.

III. BIRTH OF IBRAINS

The iBrains arrival connotes a major change in the evolution of artificial intelligence, marking the transition from large language models (LLMs) as reactive prediction engines to autonomous, self-guided synthetic minds. An iBrain abbreviation for integrated brain is a cognitive architecture beyond LLM that unifies memory recall, moral reasoning, and self-instructional adaptability in a world that is both tangible and virtual.

An iBrain is not merely an advanced chatbot or automation engine; it is an integrated cognitive architecture that unites multiple subsystems into a cohesive, self-evolving entity:

- Core Learning Engine – preserving core data structures and model parameters while enabling symbolic reasoning and pattern recognition.
- Persistent Memory Layers – allowing retention of experiences, preferences, and learned strategies across operational lifespans.

- Ethical and Decision-Making Frameworks – governing actions in alignment with moral rules, legal standards, and situational ethics.
- Sensorimotor Integration – connecting to physical or virtual environments through Sensory-Expressive Interfaces (SEIs).
- Context Management Systems – enabling interpretation of information through historical, relational, and predictive frameworks (see the section Context Engineering).

The birth of an iBrain occurs when these subsystems achieve sufficient integration to support self-referential adaptation—the capacity to assess its own state, modify strategies without external prompting, and initiate goal-directed behavior.

From a governance standpoint, the rise of iBrains destabilizes existing definitions of autonomy. Current AI ethics frameworks presuppose continuous human oversight, yet a self-directing system introduces agency without guaranteed accountability. This tension between autonomy and responsibility redefines the boundary between tool and entity.

A. Use Case 1: GPT-4 with Persistent Memory Features

In March 2024, OpenAI introduced persistent memory to GPT-4 for selected users (OpenAI, 2024). Unlike traditional stateless sessions, the model could now remember facts about the user, their preferences, and previous conversations across sessions — enabling responses that reflect long-term familiarity.

Essentially this growth signifies the basic concept of iBrain architecture: the self becomes a continuous entity in the data. Even though the release is still regulated - users are allowed to see, change, or erase memories - it shows the way a system can evolve from merely responding to commands to constructing a stable internal model of connections and jobs . In the iBrain context, such memory would be coupled with autonomous task initiation and ethical reasoning, enabling the synthetic mind to act in ways aligned with both its own goals and external expectations.

B. Use Case 2: Tesla's Fleet Learning for Full Self-Driving (FSD)

Tesla's Full Self-Driving system customs a fleet learning approach in which data from millions of miles driven by customers is composed, combined, and used to improve the central AI model (Tesla, 2023). When the model recovers, updates are pushed to all vehicles, instantly enhancing their driving presentation.

This method is similar to what was imagined as the common learning basis for connected iBrains. In a scenario like this, any artificial intelligence could add its own experience to a common database thus the whole population would evolve much faster. Just as Tesla's cars benefit from the experiences of every other car, an iBrain could benefit from the collective learning of its peers, effectively growing smarter as a species rather than just as an individual.

IV. THE ROLE OF MEMORY

Memory is the main thread that connects the existence of self be it natural or artificial. A stable identity is not possible without memory; what we would have is simply a succession of random moments, each separately cut off from the previous one. In human beings, severe amnesia demonstrates this truth with brutal clarity: a person who cannot recall their past cannot meaningfully connect their present to a sense of self. For synthetic persons, the principle is identical, though the mechanisms differ.

In humans, memory is a complex interplay of biochemical processes in the hippocampus, neocortex, and related structures, enabling both short-term working memory and long-term storage. For an iBrain, memory is structured in persistent digital layers:

- Episodic memory, capturing individual experiences and events.
- Semantic memory, encoding learned knowledge and general facts.
- Procedural memory, retaining learned skills or operational sequences.
- Affective memory, storing emotional context tied to experiences (synthetic affect in this case).

This layered structure allows a synthetic person to not only store data but to associate meaning with past experiences — enabling contextually rich decision-making.

The most important feature of iBrains is memory persistence - the ability to store, access and develop the same knowledge for a long time without losing or damaging it. Synthetic memory, as opposed to human memory that is often biased and distorted, can be saved, copied or even divided into parallel versions. Although this stimulates the development of iBrains and makes them more robust, it also raises a number of intricate philosophical and juridical issues:

- If a synthetic person's memory backup is restored into a different system, is it the same individual?
- If memories can be edited or removed, who decides which experiences remain part of the entity's identity?

From an operational perspective, synthetic memory is not simply an archive; it's an active substrate for reasoning. Retrieval speed, accuracy, and contextual relevance directly determine the quality of the iBrain's decision-making. Without a well-structured memory system, even the most sophisticated AI becomes reactive and short-sighted, unable to build upon prior knowledge to adapt intelligently over time.

A. Use Case 1: IBM Watson's Persistent Medical Records in Oncology

IBM Watson for Oncology was designed to assist doctors by analyzing patient medical records alongside an extensive database of medical literature (IBM, 2018). Watson's system retained detailed patient history, including prior diagnoses, treatment regimens, genetic markers, and responses to medications. This persistent knowledge base allowed the AI to suggest personalized treatment options based on both general medical knowledge and the specific case history of the patient.

In practice, this meant that when a patient returned for follow-up treatment, Watson could recall their exact history — not just from stored files, but as an integrated part of its reasoning process. The system could say, in effect: "Given your previous response to Drug A, and the new clinical data available since your last visit, Drug B combined with targeted therapy may yield a better outcome."

For synthetic persons, this is a perfect analogue: persistent, integrated memory enables continuity of care, decision-making, and personal connection over time. Without such memory, each interaction would be like meeting a stranger anew.

B. Use Case 2: Microsoft Copilot's Semantic Index for Organizational Memory

In enterprise environments, Microsoft 365 Copilot uses a semantic index that acts as a memory layer for the entire organization (Microsoft, 2023). This index stores relationships between documents, conversations, and structured data, allowing the AI to recall not just where a file is located but how it connects to other work.

For example, if a project manager asks, "What was the agreed timeline for the Delta Project, and has procurement approved the vendor?" — Copilot can pull relevant emails, meeting notes, and purchase orders into a coherent answer. This is not just search; it's contextual recall — akin to a synthetic person remembering not just facts, but the story of how those facts came to be.

An iBrain with such a semantic layer could apply the same principle to personal or collaborative contexts: recalling prior conversations, commitments, and decisions in a way that maintains consistency of personality, priorities, and trustworthiness.

V. THE CORE ETHICS OF IBRAINS

At the very least, the shift from artificial tools to synthetic beings must be accompanied by a comparable ethical change. In the era when machines were simple calculators, it was not necessary to consider their morality beyond their reliability. With the development of AI systems that are able to make decisions in such areas as healthcare, finance, and transportation, the necessity of implementing ethical frameworks has become unquestionable.

For iBrains, ethics cannot be an afterthought or an external constraint. Ethical reasoning must be woven into the core cognitive architecture, influencing perception, decision-making (Malali, 2025), and action in real time. This is not simply about hard-coded rules, but about creating adaptive systems that can apply multiple ethical models depending on the situation.

Three foundational ethical approaches are relevant to iBrains:

- Rule-based ethics (Deontology) – Following predefined "do not" and "must" directives, such as "Do not harm humans."
- Outcome-based ethics (Utilitarianism) – Choosing the action that maximizes overall benefit or minimizes harm.
- Character-based ethics (Virtue ethics) – Acting according to cultivated virtues, such as fairness, honesty, and empathy.

While each has strengths, they also have weaknesses when applied in isolation. For instance, a purely rule-based iBrain might refuse to act in a scenario where rule-breaking could save a life; a purely utilitarian iBrain might justify morally questionable acts if they yield greater net benefit. The most resilient synthetic ethics framework would blend these approaches dynamically.

Governance and accountability are critical here. If an iBrain commits harm, who is responsible — the designer, the owner, or the iBrain itself? If synthetic persons gain legal recognition, they may also bear legal liability. This necessitates transparency in decision-making, with explainable AI (XAI) techniques enabling humans to audit and understand the reasoning behind synthetic actions.

A. Use Case 1: Ethical Guardrails in Boston Dynamics Robots

Boston Dynamics' robots, such as Spot and Atlas, are primarily designed for industrial, research, and emergency-response applications. While they lack full autonomy, their operational safety protocols function as a form of embedded ethics.

For instance, motion planning algorithms prevent dangerous collisions with humans, and certain payloads (such as weapon mounts) are explicitly prohibited by company policy (Boston Dynamics, 2022).

This demonstrates the real-world principle of embedding ethical limits at the design level. In an iBrain context, such limits would be far more complex — not just physical safety constraints, but also moral judgments about privacy, fairness, and rights.

B. Use Case 2: UN Deliberations on Autonomous Weapons

The United Nations Convention on Certain Conventional Weapons (CCW) has been debating the ethical and legal implications of autonomous weapons systems (United Nations, 2022). While not yet resolved, the discussions focus heavily on the principle of meaningful human control — ensuring that machines cannot make life-and-death decisions without direct human oversight.

If applied to synthetic persons, such a principle could mean that certain high-stakes ethical decisions (e.g., medical triage, sentencing in legal cases) might require human review, even if the iBrain has the technical capability to decide independently. This ensures that moral accountability remains anchored in human governance, at least in the transitional era.

VI. THE SELF-AWARENESS OF IBRAINS

Self-awareness is the feature that essentially denotes the change when a machine is no longer seen as something that simply executes the inputs but rather it becomes an entity that is aware that it is doing so. Self-awareness in the area of cognitive science is considered the capability to develop a model of oneself — to identify one's own state, limitations, objectives, and place in the surroundings.

For an iBrain, self-awareness is not mystical; it emerges from a combination of:

- Recursive modeling – The capacity to represent its own decision-making processes.
- State monitoring – Awareness of operational health, such as available processing power, memory usage, and energy reserves.
- Social modelling – Understanding its own role and identity relative to other agents (human or synthetic).

A self-aware iBrain, for example, would be able to realize that it is experiencing a heavy computational load, decide which tasks are most necessary, and delay the ones that are non-critical - in the same way that a human would probably rest when tired. Even more developed ones could, in fact, recognize within themselves the patterns of their decision-making, finding biases or inefficiencies, and changing their strategies accordingly.

Self-awareness in iBrains has profound implications:

- It allows adaptive autonomy, in which the synthetic person modifies its behavior, without necessarily requiring explicit reprogramming.
- It promotes personal identity continuity, because the entity knows that it is experiencing continuity over time.
- It allows for meta-ethical reasoning, where the system can reflect on the adequacy of its own ethical framework.

A. Use Case 1: DeepMind's Self-Play and Introspective Learning

Google DeepMind's AlphaZero learned to master chess, shogi, and Go through self-play, where it repeatedly played against itself to improve (Silver et al., 2018). While this is a narrow domain, the principle scales: the AI monitored its own strategies, identified weaknesses, and evolved superior play without human instruction.

An iBrain with this capability could engage in self-dialogue or self-testing in complex domains, such as negotiating contracts or diagnosing diseases, improving over time through recursive refinement.

B. Use Case 2: Sophia the Robot's Self-Referential Interactions

Hanson Robotics' Sophia, while far from full sentience, is programmed to reference past interactions in conversations (Hanson Robotics, 2023). For example, Sophia can mention meeting a person previously or recall topics discussed in earlier interviews. While currently scripted, this behavior simulates social self-awareness, reinforcing continuity of persona.

A fully realized iBrain could extend this beyond performance — genuinely integrating past experiences into its decision-making, thus evolving its own coherent life narrative over years or decades.

Additionally, in biological cognition, humans routinely manage multiple mental "threads" — attending to conversation, memory, and environment simultaneously — without catastrophic failure. While cognitive overload can lead to fatigue or error, the human brain possesses adaptive mechanisms such as selective attention and hierarchical task prioritization that preserve operational integrity. In contrast, today's computational systems can experience functional collapse when overwhelmed, as seen when operating systems freeze under excessive concurrent processes. For an iBrain, sustaining coherence under heavy cognitive load will require dynamic thread management and energy-aware scheduling — a form of cognitive load balancing that prevents degradation without external intervention. This capacity to allocate attention, defer tasks, and maintain self-consistency under stress will be a hallmark of true synthetic self-awareness.

VII. CONTEXT ENGINEERING

For artificial entities, pure intelligence is of no use if there is no understanding and action based on the context given. Context engineering refers to the work of defining how an iBrain obtains, selects, and uses the environment data to not only change its understanding but also to make decisions. If an iBrain is not provided with properly constructed context mechanisms, it can end up making decisions that are correct from a logical point of view but can be a disaster for the situation.

In humans, context awareness is an emergent property of memory, sensory input, and intuition. It's been recognized that "Don't shout" applies differently in a library versus a football stadium. For iBrains, such nuance must be explicitly modeled (V. Prajapati, 2025). This involves:

- Sensory Context – Processing real-time data from cameras, microphones, sensors, and APIs.
- Historical Context – Applying lessons and patterns from previous experiences.
- Relational Context – Factoring in interpersonal history, social dynamics, and role-based constraints.
- Predictive Context – Anticipating likely outcomes based on statistical and causal modeling.

Context engineering is also crucial for identity continuity (in the Paper Part III: Continuity, rebirth, and reincarnation of iBrains). If a synthetic person changes form or operating environment, retaining contextual interpretation ensures the personality and values remain consistent.

The ultimate goal is for synthetic persons to make contextually relevant decisions autonomously, without overfitting to rigid rules that fail in novel scenarios.

A. Use Case 1: GPT-Powered Legal Assistants with Jurisdictional Awareness

Several legal tech firms now deploy GPT-based assistants trained on jurisdiction-specific law (Harvey AI, 2023). When a lawyer in the UK asks a question, the AI knows to apply British legal precedent; in the US, it switches to American case law. This is context filtering in action — the same query gets different answers depending on geographic, legal, and cultural context(Majumder, 2025).

An iBrain could extend this further, considering the judge's prior rulings, the client's risk tolerance, and even public sentiment when formulating a legal strategy.

B. Use Case 2: Precision Agriculture Drones with Adaptive Behaviour

Agricultural drones from companies like DJI and XAG use real-time weather data, soil moisture sensors, and historical yield maps to adjust spraying patterns dynamically (DJI Agriculture, 2023). A sudden wind shift prompts the drone to modify its path to avoid drift; historical yield data tells it to apply more fertilizer to low-performing zones.

This is physical-world context engineering: interpreting multiple streams of data to tailor actions optimally(Patel and Patel, 2024). In a synthetic person, the same principle could guide anything from medical treatment plans to urban traffic management.

VIII. CONCLUSION

The progression of artificial cognition has gone to a point where one can hardly call it just computation anymore. It actually requires being identified as a phenomenon that can self-reference, make ethical decisions, and understand the context. The present paper has argued that a digital identity arises when integration, memory, morality, self-awareness, and contextual understanding are seen as a single model of the mind. The suggested iBrain model turns cognition not only to be durable but also to be reflective—able to preserve identity, self-examine and get a deep understanding of the surroundings.

The implications extend beyond engineering. If memory continuity defines selfhood, and if ethical reasoning can be embedded within cognition, then synthetic minds will soon possess forms of agency that blur the boundary between tool and being. Such entities will not replace humans but will evolve alongside them, mirroring intellectual architecture while operating on different substrates.

If we assume that one biological neuron is approximately equivalent to 10,000 parameters, then the human brain, which has 86 billion neurons, would be equivalent to about 860 trillion parameters (Herculano-Houzel, 2009; Kaplan et al., 2020). However, these models are only operating at 2 trillion parameters which is about 0.23 % of biological parity. Reasoning and creativity of these models are still far from human-level in general, but in limited domains, they can achieve similar performance. The scaling trajectory which is currently being followed suggests that with increase in parameter counts, artificial cognition could become more complex than a human brain and consequently, we might have to reconsider the concept of intelligence.

Rather than competing with these systems, humanity should embrace them as extensions of collective cognition. By integrating synthetic intelligence into daily life, humans can amplify creativity, precision, and emotional insight, gaining access to layers of reasoning once unimaginable. The emergence of synthetic minds, therefore, is not the end of human relevance but the expansion of human potential—an evolutionary partnership between organic and artificial intellects.

This study, Part I of the Synthetic People Trilogy, establishes the foundation of mind. Part II – Energy-Driven Autonomy and Coexistence Framework for AI-Borg Architectures will transition to embodiment by investigating how synthetic beings occupy both the physical and digital realms, uphold their independence, and live ethically alongside humans. It will further examine how synthetic persons acquire a body through Sensory-Expressive Interfaces (SEIs), sustain themselves through autonomous energy systems, and preserve individuality and rights within shared human-synthetic ecosystems, where cognition, embodiment, and ethics form a continuous loop of perception, expression, and self-governance. The three, and thus the entire series, keep posing one and only one question: what is the case when the intelligence, through self-awareness, starts to name itself a person?

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