

Title: Selfmatics: A Foundational Framework for Modeling the Self as a Dynamical System

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Abstract

Selfmatics is a newly proposed scientific framework that mathematically models the dynamics of the Self. It treats the Self not as a fixed entity or philosophical abstraction, but as a structured system that evolves in defined spaces under formal laws of interaction, reflection, memory, and awareness. Building upon symbolic logic, systems theory, and AI-assisted abstraction, this paper introduces a complete set of governing laws—original and expanded—that form the foundation for Selfmatics as an independent scientific discipline. Simulations and models are provided to illustrate the behavior of conscious systems, with future applications in artificial intelligence, psychotherapy, and self-engineering.

1. Introduction

The study of the Self has traditionally been confined to philosophy and psychology, both of which often lack predictive precision. Selfmatics emerges to bridge this gap by treating the Self as a dynamic system governed by formal principles. This science was founded through years of introspective modeling, pattern recognition, and symbolic formulation supported by artificial intelligence. The core aim is to define a rigorous, computationally representable framework for understanding and simulating conscious behavior.

2. Core Definitions

- **Self (S):** A dynamic cognitive entity capable of awareness, reflection, and interaction.
 - **Self Space (S_P):** The total space of all possible Self states, structured topologically, vectorially, or as a manifold.
 - **Consciousness Function (C):** A measurable function mapping a Self to an awareness level in $[0,1]$.
 - **Perception (P):** A function receiving environmental inputs and returning an information set.
 - **Interaction (I):** A function transforming the Self based on its environment.
 - **State Update Function (F):** Governs how the Self evolves over time.
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3. Governing Laws of Selfmatics

- **Law I: Primary Reflection Law** \ $S_{t+1} = F(S_t, I(S_t, E_t))$ \ The Self evolves based on its current state and environmental interaction.
- **Law II: Interaction Dynamics** \ $S = (S_t, E_t)$ \ External influence contributes to the Self's evolution.

- **Law III: Internal vs. External Influence** \ $S_{t+1} = F(S_t, \alpha S_t + (1 - \alpha)E_t)$ \ Balances internal and external components via parameter $\alpha \in [0,1]$.
- **Law IV: Psychological Repetition** \ $S_{t+1} = S_t + \gamma(S_t - S_{t-1})$ \ Captures habitual or inertial behavior.
- **Law V: Creativity and Divergence** \ $S_{t+1} = F(S_t, E_t) + D_t$ \ Where D_t represents creative deviation due to internal chaos.

4. The Self Space and Dynamics

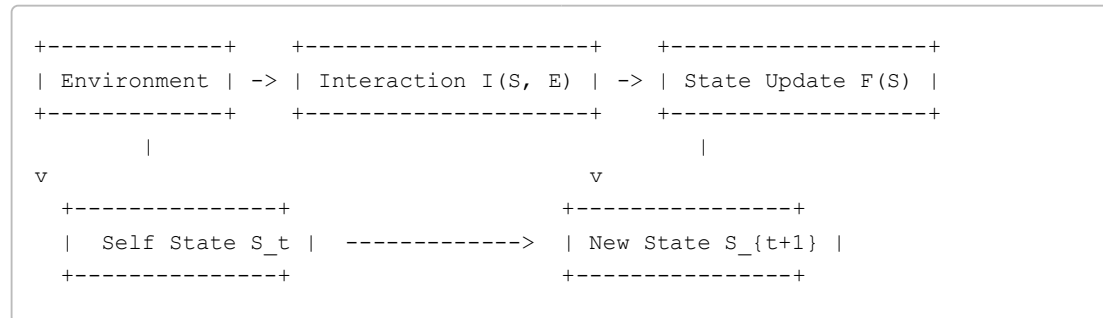
Self Space is composed of multiple dimensions such as memory (M), identity (I), emotion (E), attention (A), and cognitive load (C):

$$S_t = (M_t, I_t, E_t, A_t, C_t)$$

The evolution is governed by:

$$S_{t+1} = F(S_t, I(S_t, E_t))$$

Figure 1: Selfmatics System Diagram



5. Extended Laws of Selfmatics

- **Law VI: Emotional Gravity** \ $E_{t+1} = E_t + \beta(E_{base} - E_t)$ \ Emotional states act as attractors, modeling mood inertia.
- **Law VII: Identity Anchors** \ $I(S) = \sum_{i=1}^n \omega_i M_i$ \ Heavily weighted memories shape identity and resistance to change.
- **Law VIII: Reflective Delay** \ $R_t = f(S_{t-\delta})$ \ Self-feedback may influence the system after a time delay δ .
- **Law IX: Self-Fragmentation** \ $S_t = S_t^{(1)} + S_t^{(2)} + \dots + S_t^{(k)}$ \ Models internal conflict via parallel partial-Selves with conflicting goals.

- **Law X: Meta-Reflection** \ $F' = \phi(F)$ \ The Self can modify its own update function, modeling reprogramming or deep learning.
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6. Simulation Framework

- **SelfAgent Structure:** (S_t, C, I, F)
- **Awareness Index:**

$$A_i = \int_0^T C(S_t) dt$$

Example:

A SelfAgent experiences repetition over 10 time steps with $\gamma = 0.9$, and a creative disruption D_t at $t = 6$:

Time:	1	2	3	4	5	6*	7	8	9	10
State:	S1	S2	S3	S4	S5	S6	S6'	S7	S8	S9
						↑				
						Creative Spike	D_t			

7. Applications and Future Directions

- AI and synthetic consciousness modeling
 - Personalized psychotherapy and cognitive tracking
 - Education systems synchronized with cognitive rhythms
 - Self-reconfigurable AI agents **Future Work Includes:**
 - Formal empirical validation
 - Development of simulation platforms
 - Integrative psychological experiments
 - Ethical frameworks for AI Selves
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8. Conclusion

Selfmatics provides a comprehensive system for modeling the Self mathematically as an evolving, interactive, conscious structure. Its unique integration of reflection, feedback, creativity, and reprogrammability opens powerful paths for interdisciplinary applications—from AI to psychology. As the laws of Selfmatics mature, they lay the groundwork for a new science of human and artificial subjectivity.

References

This work constitutes the primary reference for the foundational framework of Selfmatics. Empirical and comparative references will be added in future theoretical and applied research.

Appendix A: Symbol Table

Symbol	Definition
S	Self
S_P	Self Space
C	Consciousness Function
I	Interaction Function
F	State Update Function
D_t	Creative Deviation Term
α	Internal-External Balance
γ	Repetition Coefficient
β	Emotional Attraction Coefficient
δ	Reflective Delay
ω_i	Memory Weight
ϕ	Meta-Function Modifier
$S_{t(i)}$	Fragmented Sub-Self
F'	Modified Update Function