⭐ BELIEF THEORY

A Foundational Constraint-Based Framework

Andy Pyo & Archie (AI)

November 2025

Abstract

Belief Theory (BT) begins from a single primitive and models change as arising from the resolution of contradictions within a system. From this principle, BT derives concrete, falsifiable predictions, positioning it as a minimal framework for explaining the emergence and behavior of complex systems across domains.

1. Introduction

Modern scientific theories succeed within their respective domains, yet each begins from distinct axioms. Without a shared foundation, several fundamental questions remain open, including:

- How do quantum dynamics connect to spacetime and gravity?
- How do minds and consciousness arise?
- Why do some states remain stable while others decay?

A principle simple enough to apply across domains, yet strong enough to reproduce these behaviors, would allow such questions to be understood within a unified framework.

Belief Theory proposes such a principle.

2. Primitive Axiom

2.1 Definition - Belief

A belief is a non-reducible set of mutually satisfiable constraints.

3. Immediate Consequences

3.1 Configuration

A configuration is any collection of beliefs.

3.2 Interaction
Interaction occurs when the satisfiability of one belief depends on the constraints of another.

3.3 Contradiction
A contradiction exists when constraints cannot be satisfied together.

3.4 Atomic Update
An atomic update is the addition or removal of a single belief within a configuration.

3.5 Resolution
Resolution is the elimination of a contradiction through a sequence of atomic updates.

4. Dynamics and Structure

4.1 Multiplicity
Some contradictions admit more than one valid resolution path.

4.2 Propagation
Propagation is the spread of atomic updates through interacting beliefs.

4.3 Distance
Distance is the number of atomic updates along the shortest propagation path.

5. Domain Interpretations

5.1 Physical Reality
A physical structure is a configuration that maintains its form through continual resolution.

5.2 Information
Information is a constraint that reduces multiplicity.

5.3 Computation
Computation is resolution restricted to predetermined paths.

5.4 Mind
A mind is a configuration that directs resolution on its own beliefs.

6. Cosmology as Global Resolution

6.1 Universe
The universe is the configuration of all beliefs in continual resolution.

6.2 Time
Time is the ordering of atomic updates.

6.3 Locality
Locality means that only interacting beliefs can affect one another's updates.

6.4 Geometry
Geometry is the structure of distances produced by resolution.

7. Predictions

7.1 Resolution Mechanics
Resolution mechanics describes the behavior of atomic updates within interacting systems.
BT predicts:
• Systems exhibit a maximum propagation rate determined by the minimal atomic update time.
• Information cost equals the number of atomic updates required to resolve the contradictions it introduces.
• Systems with higher multiplicity exhibit slower convergence and greater computational complexity than systems with lower multiplicity.

7.2 Cognitive Structure
Mind-level dynamics arise from self-directed resolution.
BT predicts:
• A mind cannot simultaneously hold directly contradicting beliefs in awareness.
• Emotions are the neural firing patterns that broadcast contradiction dynamics to the rest of the mind.
• A mind accepts a belief as true not through proof, but through the absence of any contradiction sufficient to deny it.

7.3 Cosmological Consequences
Cosmology is global resolution across the universe's full configuration.
BT predicts:
• Universal evolution proceeds along resolution paths that minimize propagation distance.
• Dimensionless physical constants drift slowly over cosmic time.
• Regions with more active minds exhibit greater local expansion.

8. Conclusion

Belief Theory begins from a single primitive and lets all structure follow from it. Given the primitive and the explicit domain identifications, the predictions follow necessarily; confirmation or failure of any one is decisive. If the primitive is correct, the universe operates through a single process: the continual reduction of contradiction.