Emotion Simulator

Emergent Culture from Beliefs & Emotions

A computational model for simulating emergent cultural behaviors from biological and psychological primitives

Slide 1: Introduction

What is the Emotion Simulator?

A simulation framework exploring how **culture emerges** from:

- Individual agents (“Pops”) with beliefs and emotions
- Homeostatic drives (survival, reproduction, habitability)
- Social interactions and belief transmission
- Environmental constraints and resources

Core Question: Can complex cultural phenomena emerge from simple biological rules?

Slide 2: The Pops Domain Model

Entities and Their Relationships

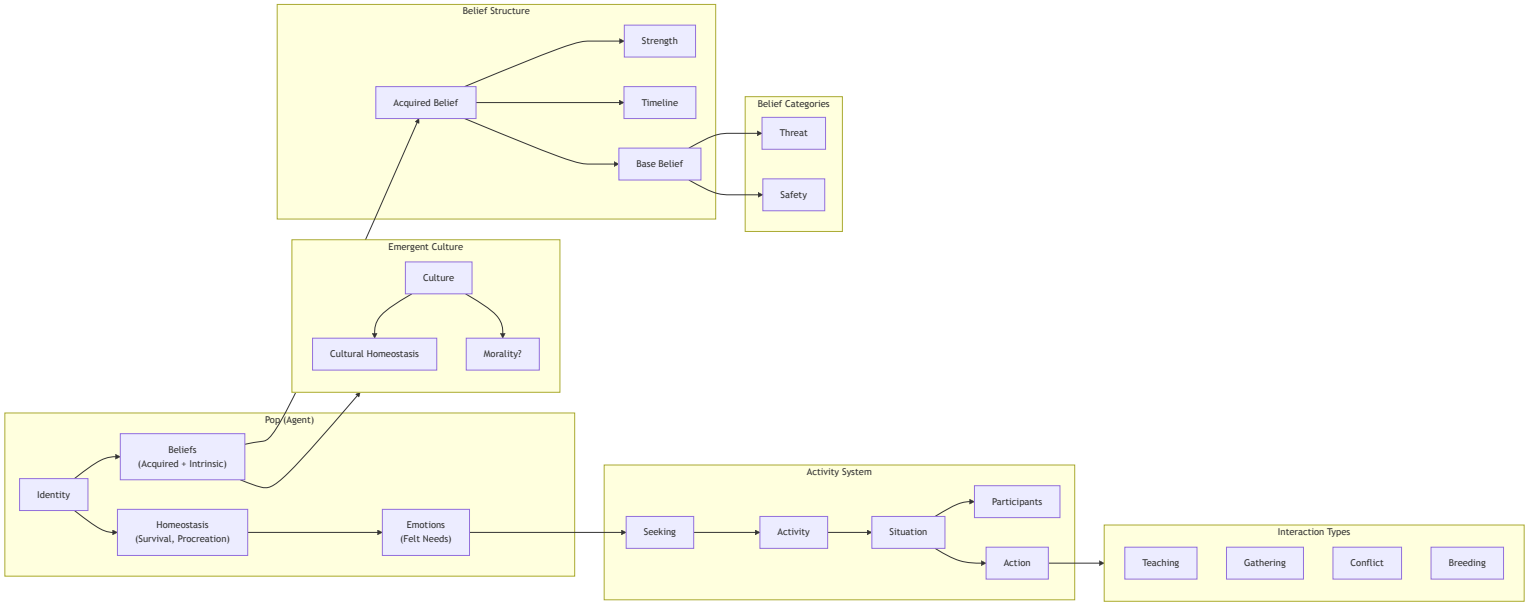


Diagram 0

Slide 3: Homeostasis - The Biological Foundation

The Three Pillars of Survival

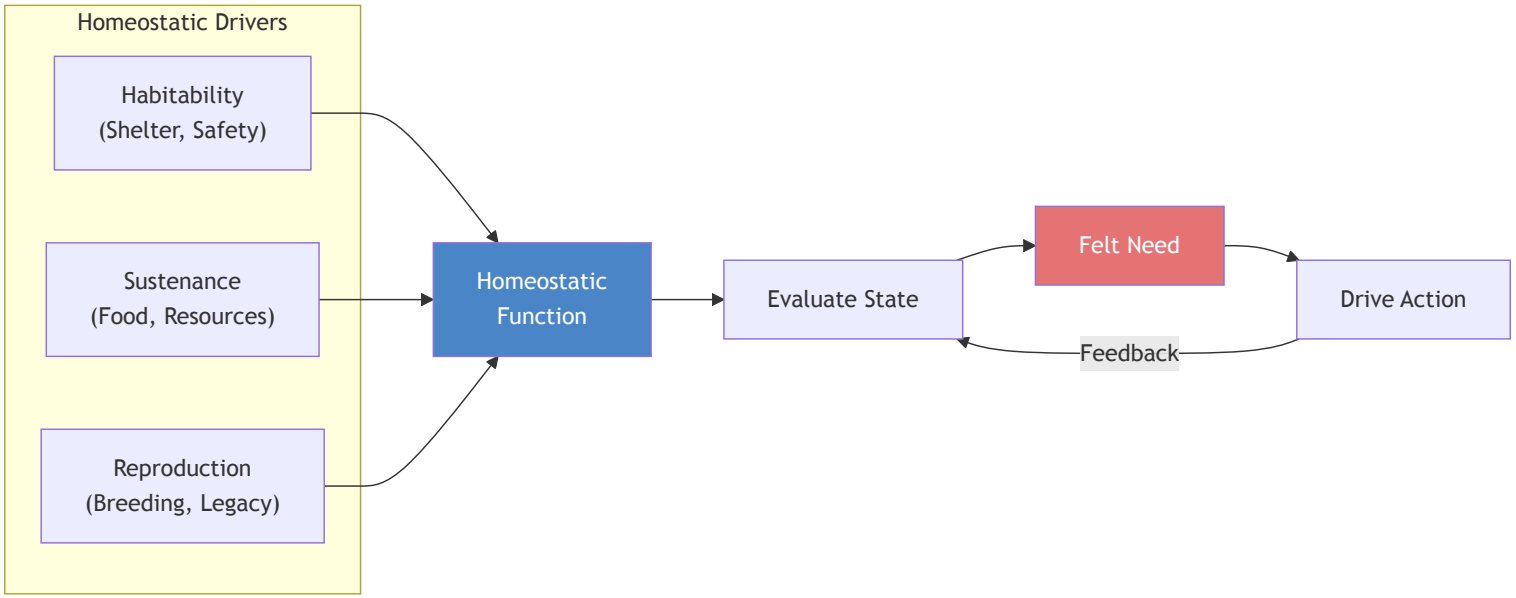
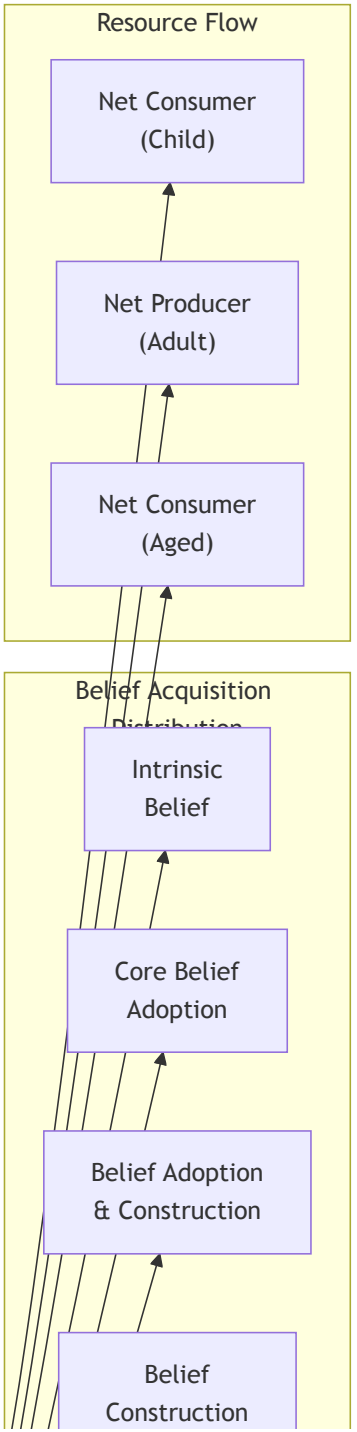


Diagram 1

Key Insight: All behavior ultimately serves homeostatic functions. Culture emerges as a *collective homeostatic mechanism*.

Slide 4: Life Cycle Model

From Birth to Death: Belief Acquisition Over Time


Resource Flow
Net Consumer (Child)
Net Producer (Adult)
Net Consumer (Aged)
Belief Acquisition
Intrinsic Belief
Core Belief Adoption
Belief Adoption & Construction
Belief Construction

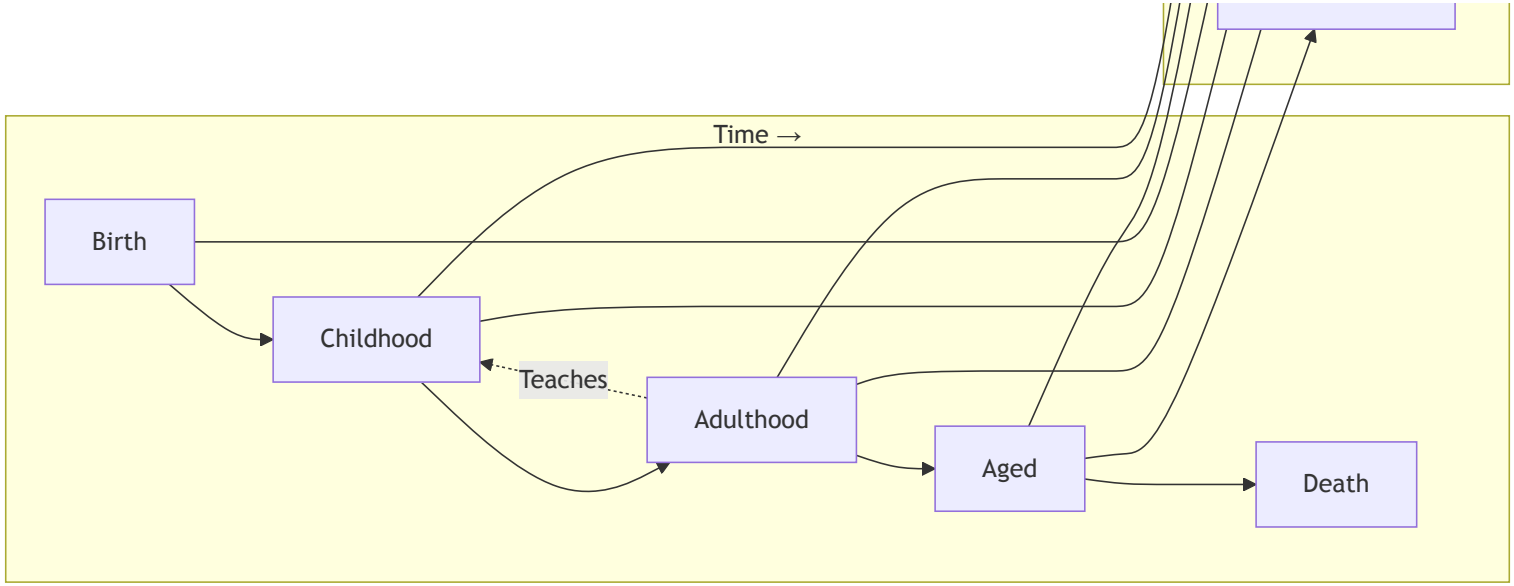


Diagram 2

Life Stages Shape Capability: - **Child**: Consume resources, acquire beliefs, require care - **Adult**: Generate resources, distribute beliefs, breed, give care - **Senior**: Consume resources, distribute beliefs, give care

Slide 5: Life Cycle Reproduction Model

Population Dynamics

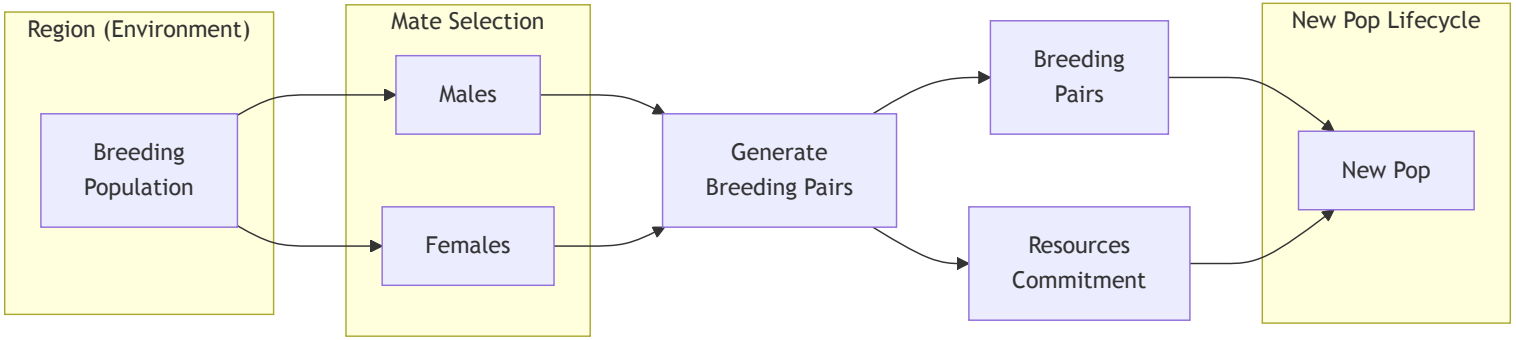


Diagram 3

Slide 6: Embodied Simulation as the Seat of Consciousness

The Complete Cognitive Architecture

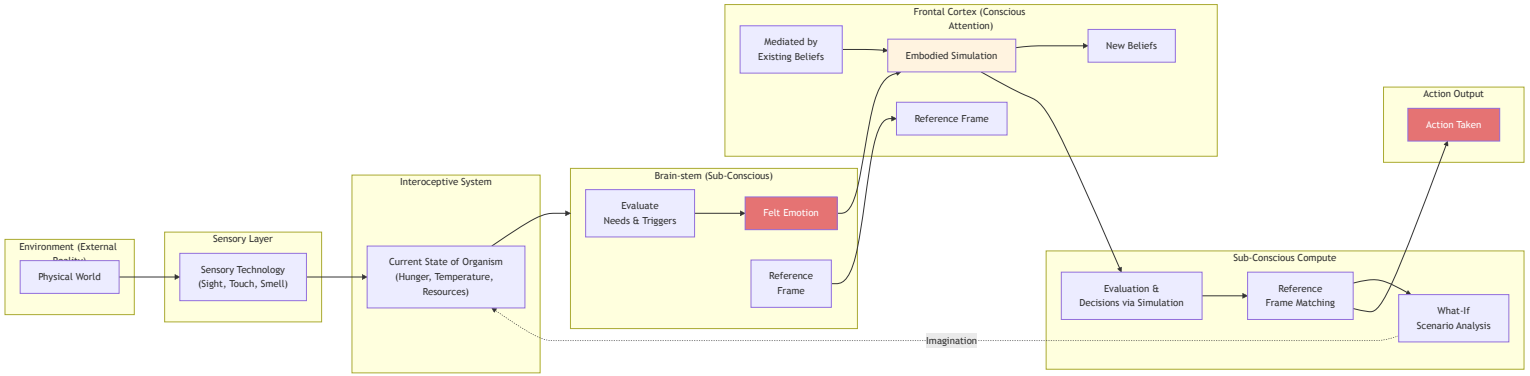


Diagram 4

Reference Frame: A specific instance of embodied simulation against which needs and triggers are evaluated. Provides context for interoceptive information. Enables “What-If” analysis (imagination, hallucination).

Slide 7: Belief Structures and Mapping

How Beliefs Drive Behavior

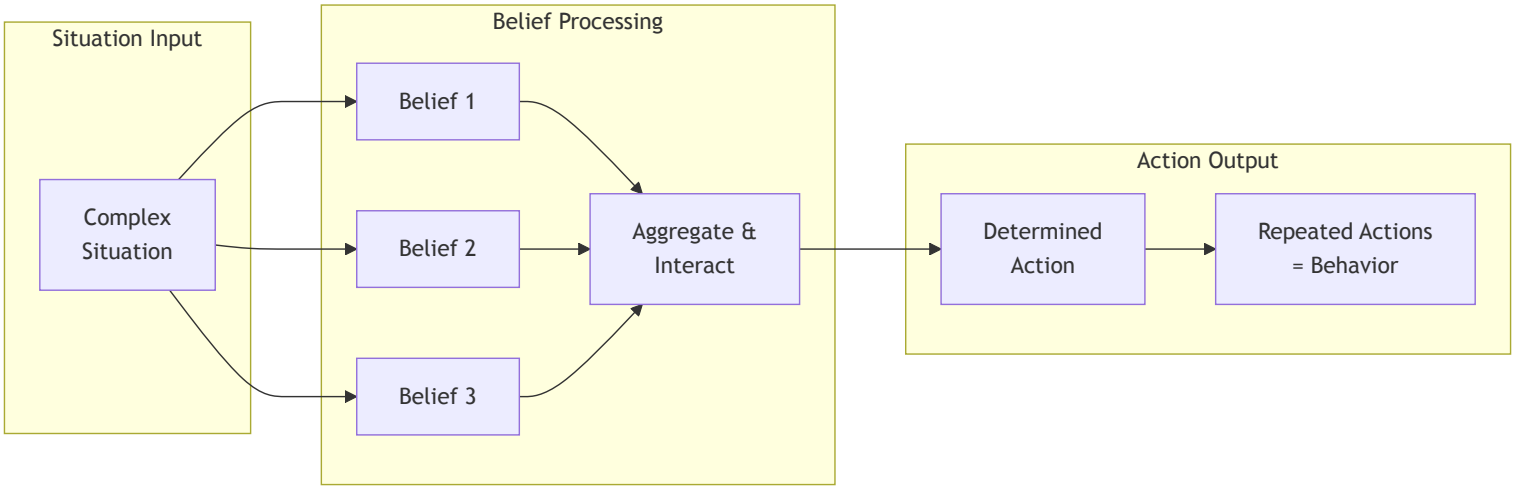


Diagram 5

Belief as Probability Function: - Variables: Childhood imprinting, strength of belief (multi-variable) - Beliefs aggregate and interact in complex situations

Emergent Behaviors from Belief Model: 1. **Identity Model** - Overrides basic homeostatic functions (e.g., cultural preservation) 2. **Belief Clusters** - Emergent clusters promulgated around population 3. **Belief Chains** - Layered beliefs referencing prior beliefs

Slide 8: The Meaning of Beliefs

Beliefs ARE Memories (But Transmissible)

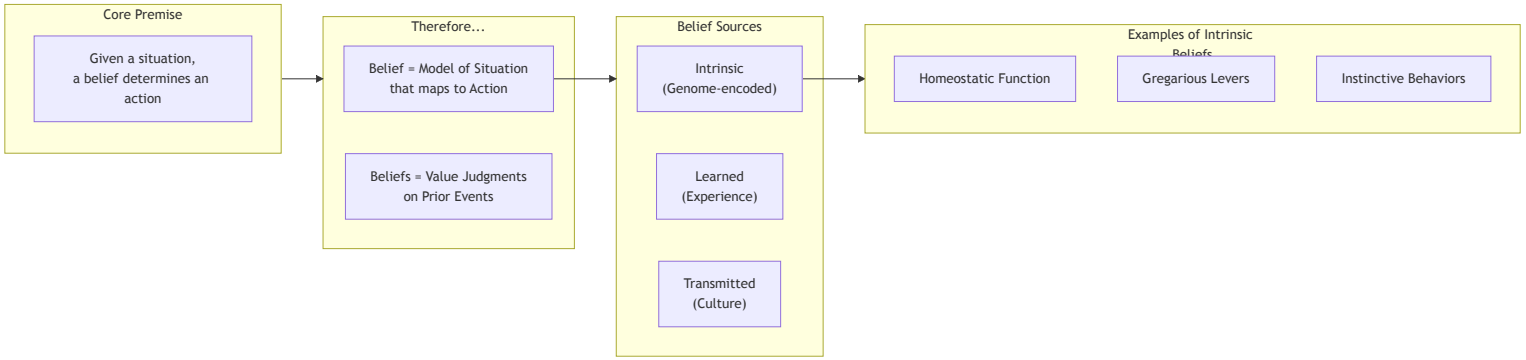


Diagram 6

Key Insight: Beliefs can be: - Hard-coded into genome (evolutionary) - Acquired through experience - Transmitted through social interaction (culture)

Slide 9: Supported Situations for the Model

Mapping Beliefs to Actions

Behavior Type	Definition	Implementation
Seeking	Traversal over solution space	Find food, find mate, find shelter
Play	Finding boundaries within limits	Seeking with exploration constraints
Optimising	Tech advancement chance	Individual intelligence as seeking capability

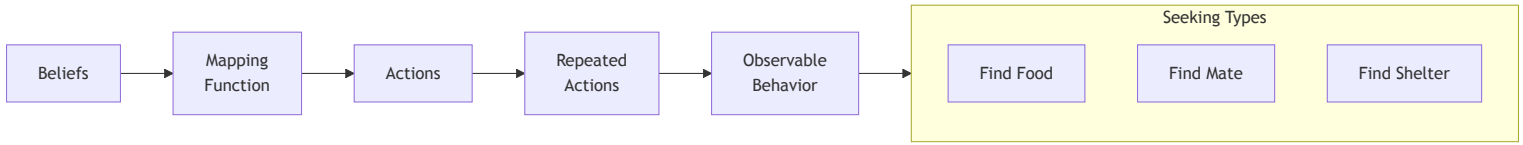


Diagram 7

Slide 10: Pop Physical Actions

Tech-Constrained Capabilities

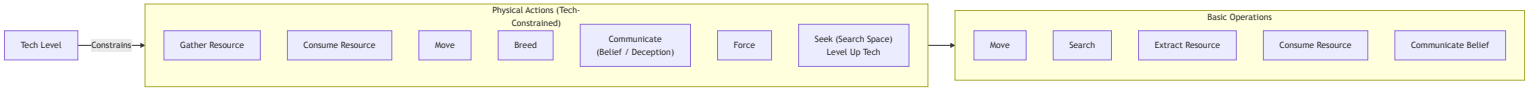


Diagram 8

All physical actions have an associated Tech Level - capabilities expand as technology improves.

Slide 11: Tech Optimisations

Technology as Efficiency Multiplier

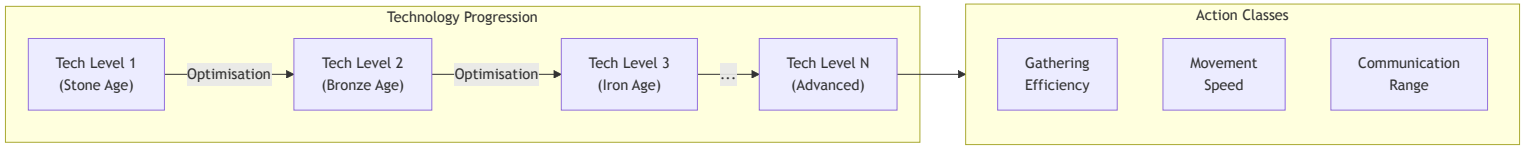


Diagram 9

Tech optimisations facilitate actions: - Each tech level in a particular Action Class improves capability - Tech is a measure of efficiency - Higher tech = more resources gathered per unit effort

Slide 12: Environment Description - Objective Reality

The Terrain Grid

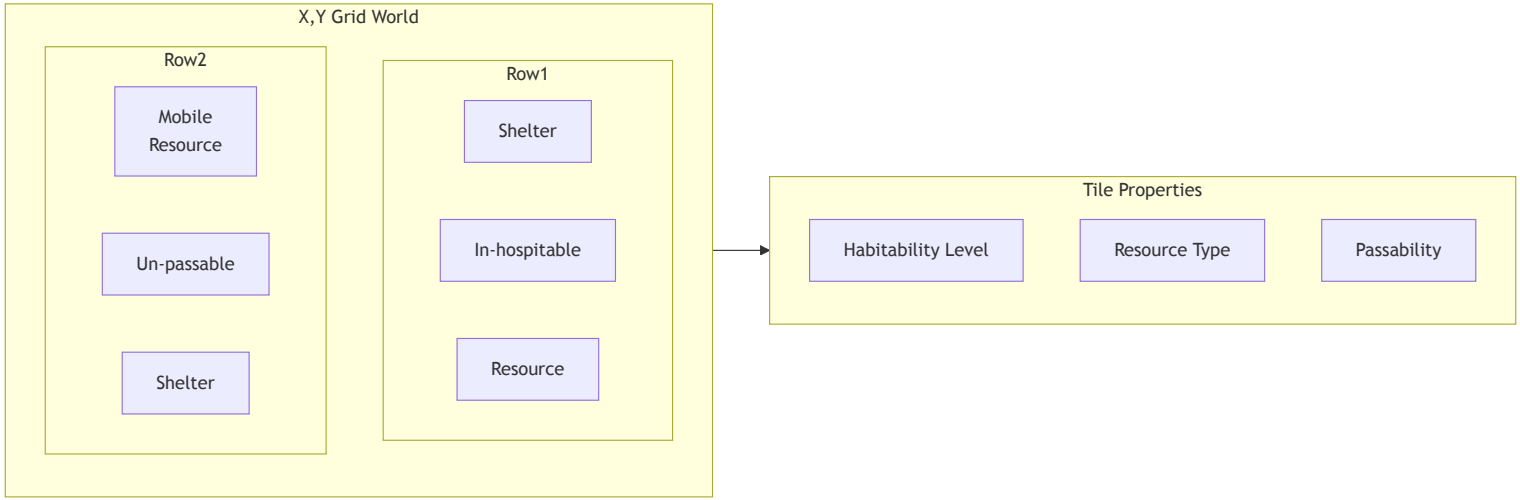


Diagram 10

Terrain Types:

Type	Description	Requirements
Shelter	Required for procreation, child-rearing, elder care	Habitability Level 1, No Tech
In-hospitable	Can survive limited period	Habitability < threshold
Un-passable	Cannot traverse	In-hospitable >= 8
Resource	Contains extractable resources	Tech level to extract/consume
Mobile-Resource	Resource that moves	Can be hunted

Slide 13: Pop Description - Emotions

Felt Needs Drive Behavior

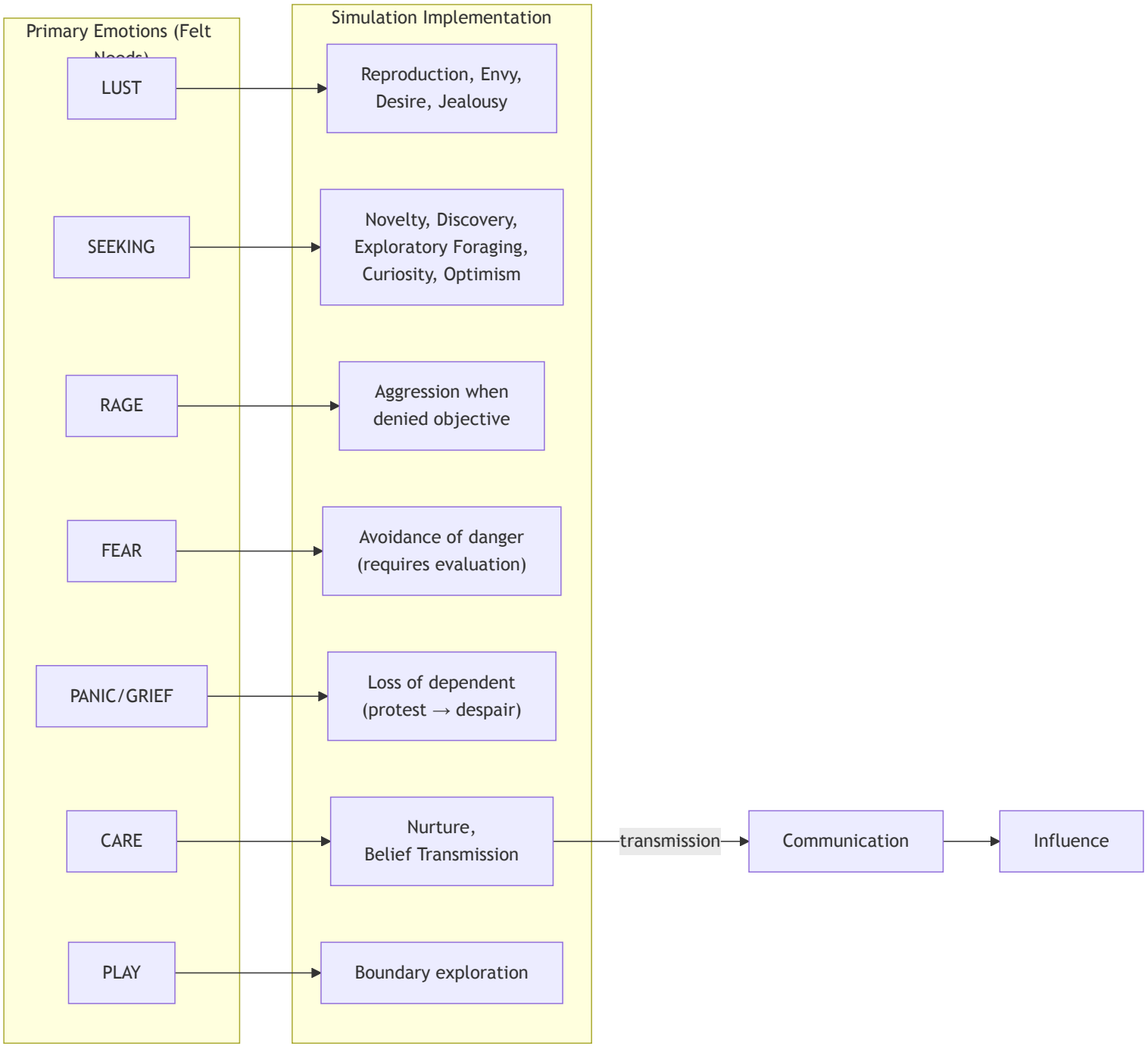
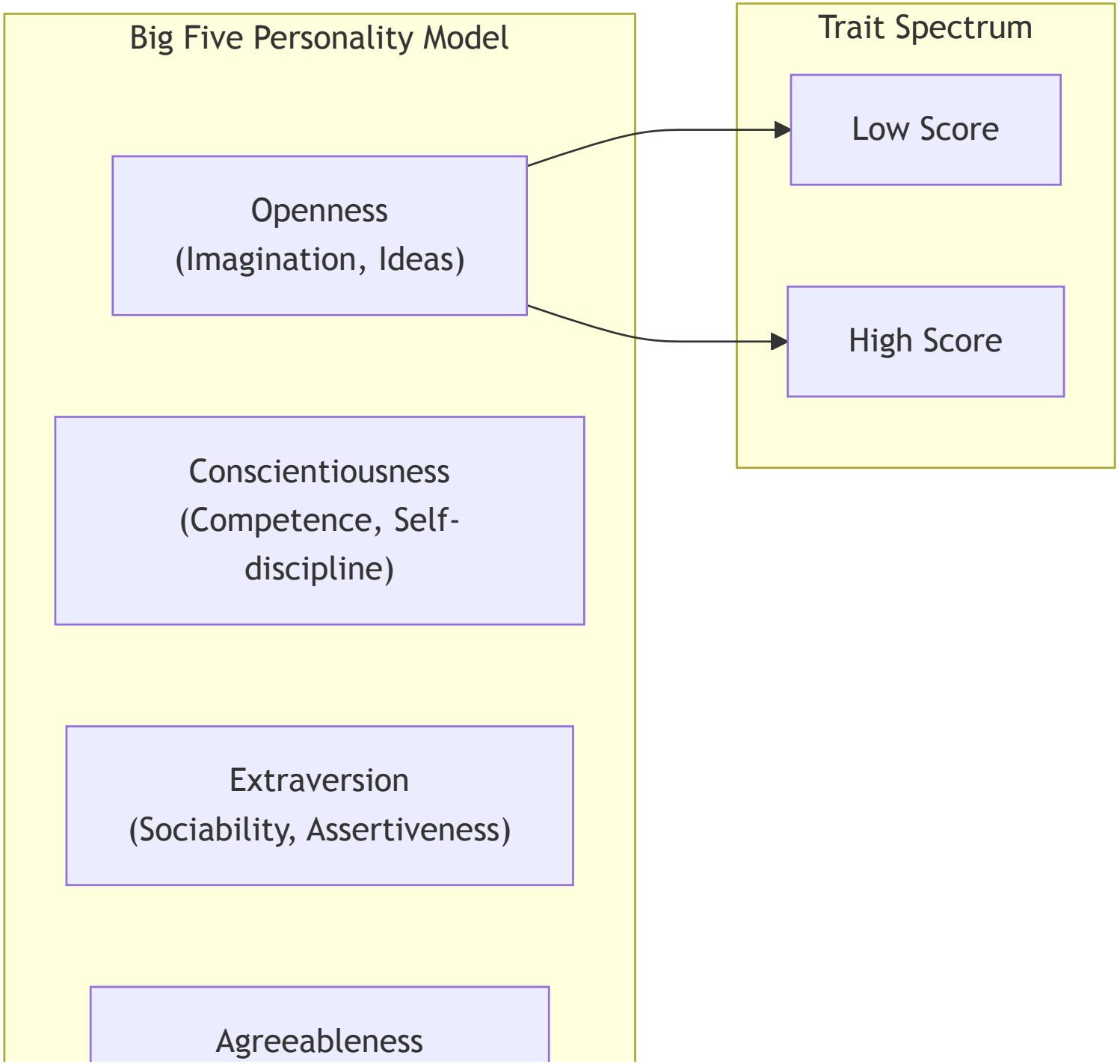

Primary Emotions (Felt
Simulation Implementation
LUST
Reproduction, Envy, Desire, Jealousy
SEEKING
Novelty, Discovery, Exploratory Foraging, Curiosity, Optimism
RAGE
Aggression when denied objective
FEAR
Avoidance of danger (requires evaluation)
PANIC/GRIEF
Loss of dependent (protest → despair)
CARE
Nurture, Belief Transmission
transmission
Communication
Influence
PLAY
Boundary exploration

Diagram 11

Slide 14: Personality Traits (Big Five / OCEAN)

Individual Variation in the Population


Big Five Personality Model
Openness
(Imagination, Ideas)
Conscientiousness
(Competence, Self-
discipline)
Extraversion
(Sociability, Assertiveness)
Agreeableness
Trait Spectrum
Low Score
High Score

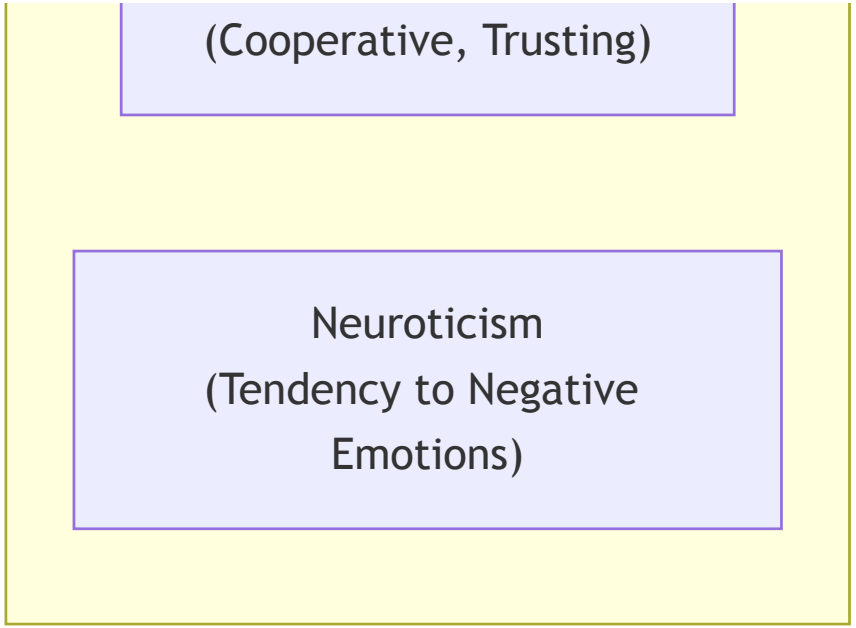


Diagram 12

Trait	Low Score	High Score
Openness	Practical, conventional, routine	Curious, wide interests, independent
Conscientiousness	Impulsive, careless, disorganized	Hardworking, dependable, organized
Extraversion	Quiet, reserved, withdrawn	Outgoing, warm, seeks adventure
Agreeableness	Critical, uncooperative, suspicious	Helpful, trusting, empathetic
Neuroticism	Calm, even-tempered, secure	Anxious, unhappy, prone to negative emotions

Slide 15: Initial MVP - Building the Simulation

Core Components to Implement

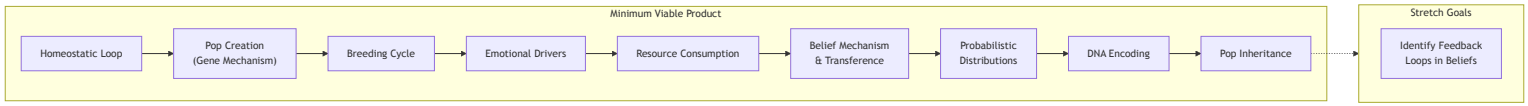


Diagram 13

Implementation Order: 1. Create homeostatic loop 2. Pop creation with gene mechanism (key, value => positional) 3. Breeding cycle <= Belief-driven decision making <= Life cycle <= Birth 4. Pop emotional drivers <= Interoceptive system 5. Resource consumption 6. Belief mechanism & transference 7. Probabilistic distribution for triggering on/off 8. Encode DNA into pop 9. Include pop inheritance

Slide 16: Pop Mental Drivers on Homeostasis

The Core Algorithm

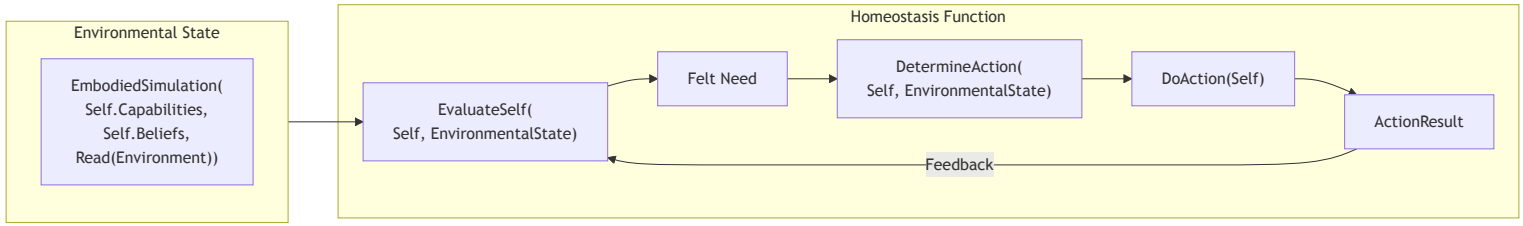


Diagram 14

Pseudocode:

```
EvaluateSelf(Self, EnvironmentalState) -> FeltNeed
    -> DetermineAction(Self, EnvironmentalState): Action
    -> DoAction(Self): ActionResult

EnvironmentalState = EmbodiedSimulation(
    Self.Capabilities,
    Self.Beliefs,
    Read(Environment)
)
```

Slide 17: Conclusions

Key Insights from the Model

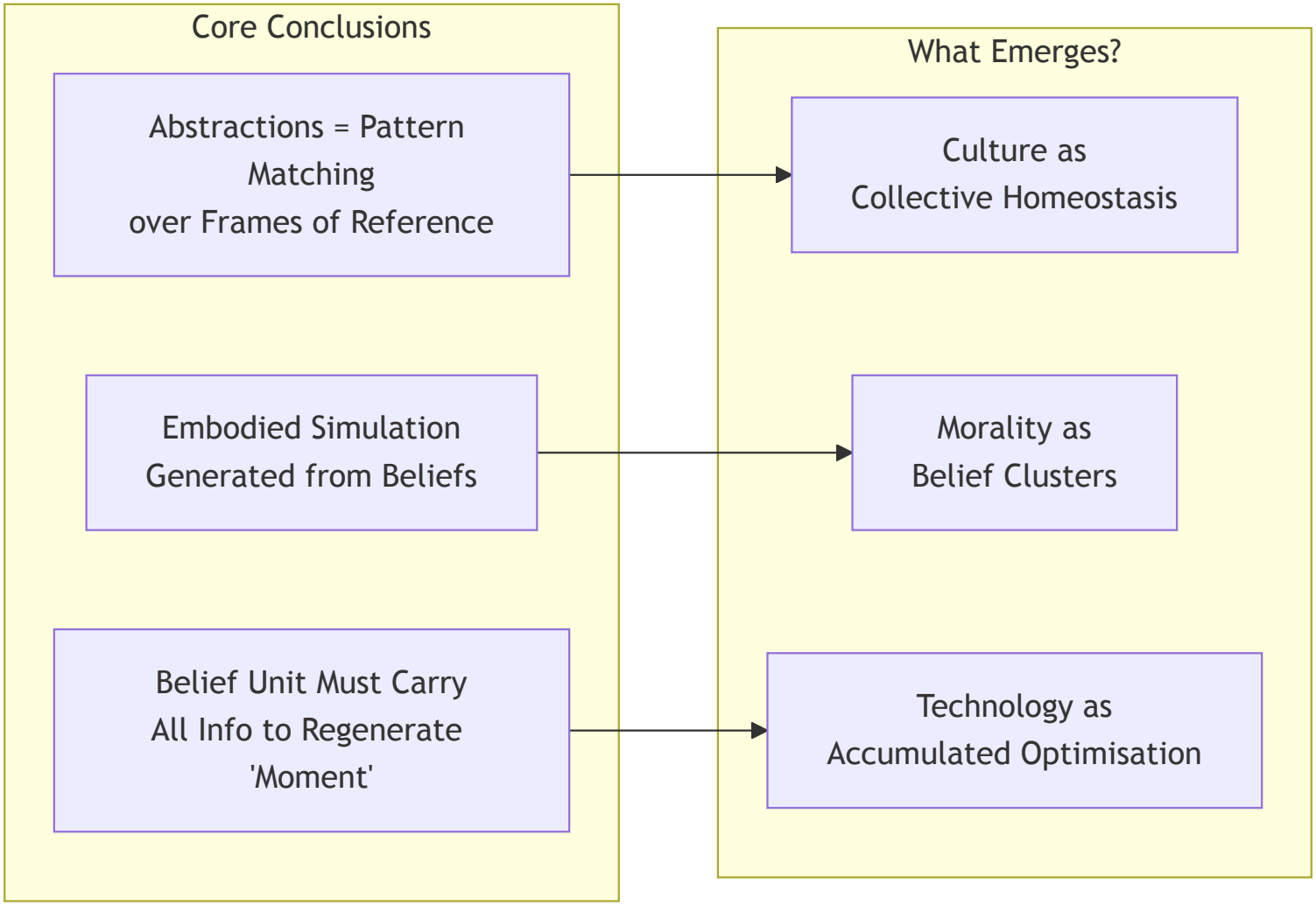


Diagram 15

Three Fundamental Insights:

1. **Abstractions are Pattern Matching** over frames of reference
2. **Embodied Simulation** must be generated from a set of beliefs
3. **The Belief Unit** is critical - must carry all information to regenerate the “Moment”

Slide 18: Capabilities Segmented by Age Cycles

Age-Based Capability Distribution

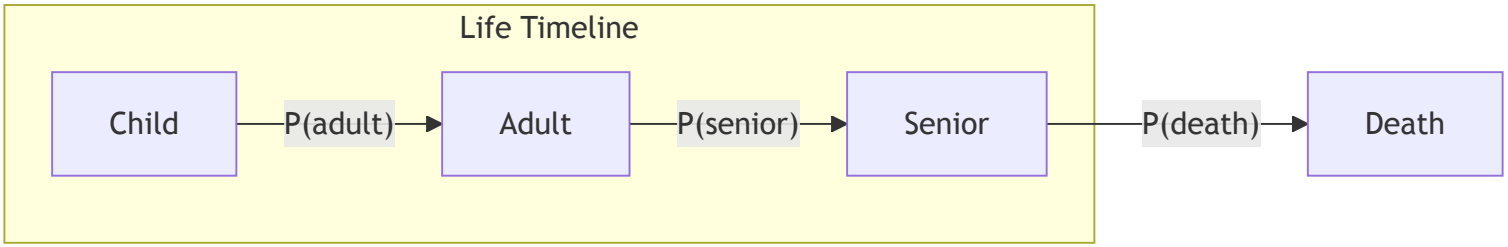


Diagram 16

Stage	Capabilities
Child	1. Consume Resources, 2. Acquire Beliefs, 3. Require Care
Adult	1. Consume Resources, 2. Generate Resources, 3. Acquire Beliefs, 4. Distribute Beliefs, 5. Breed, 6. Give Care
Senior	1. Consume Resources, 2. Acquire Beliefs, 3. Distribute Beliefs, 4. Require Care, 5. Give Care

Distribution Functions: - childDistribution - adultDistribution - seniorDistribution - deathDistribution - Avg_Death_Age

Slide 19: Distribution Functions - Future State

Continuous Capability Model

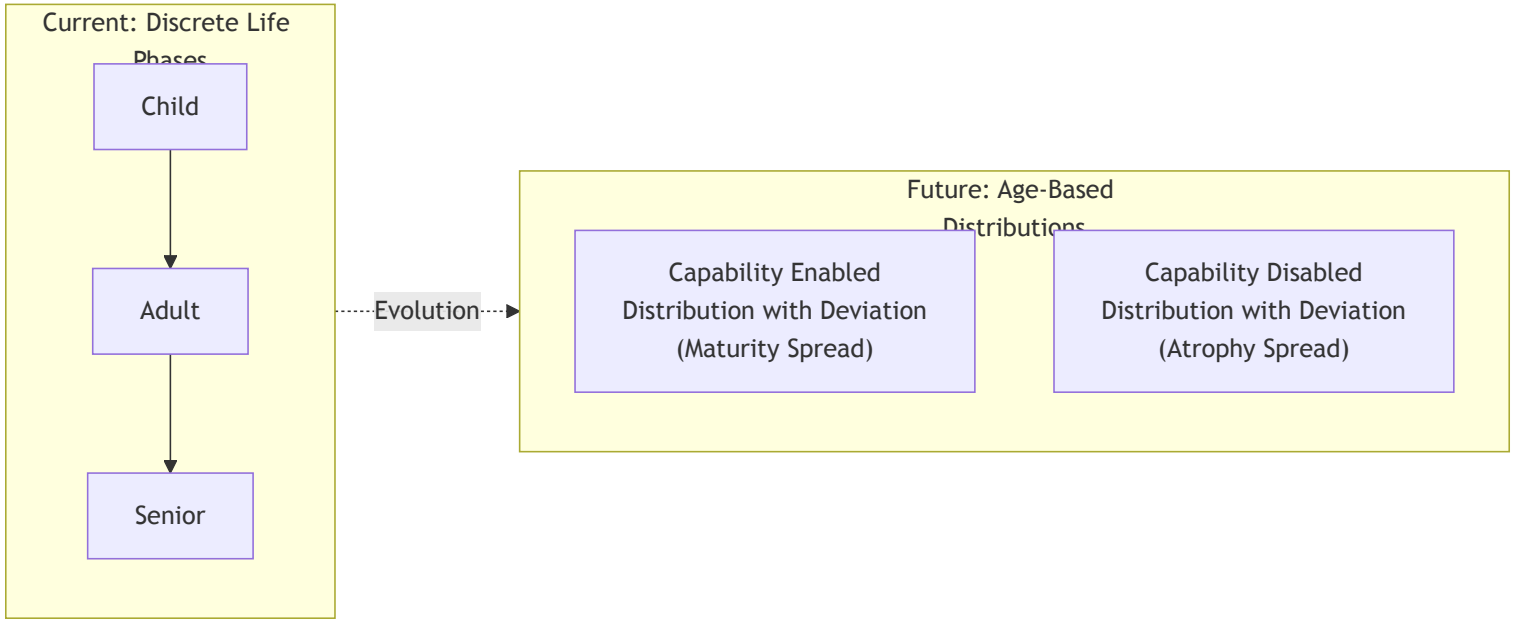


Diagram 17

Future Enhancement: Switch from distinct life phases to capabilities that are age-based: 1. **Enabled** by a distribution with deviation indicating spread of maturity 2. **Disabled** by a separate distribution indicating atrophy of capability

Slide 20: Bayes Theorem in Belief Updates

How Beliefs Change Over Time

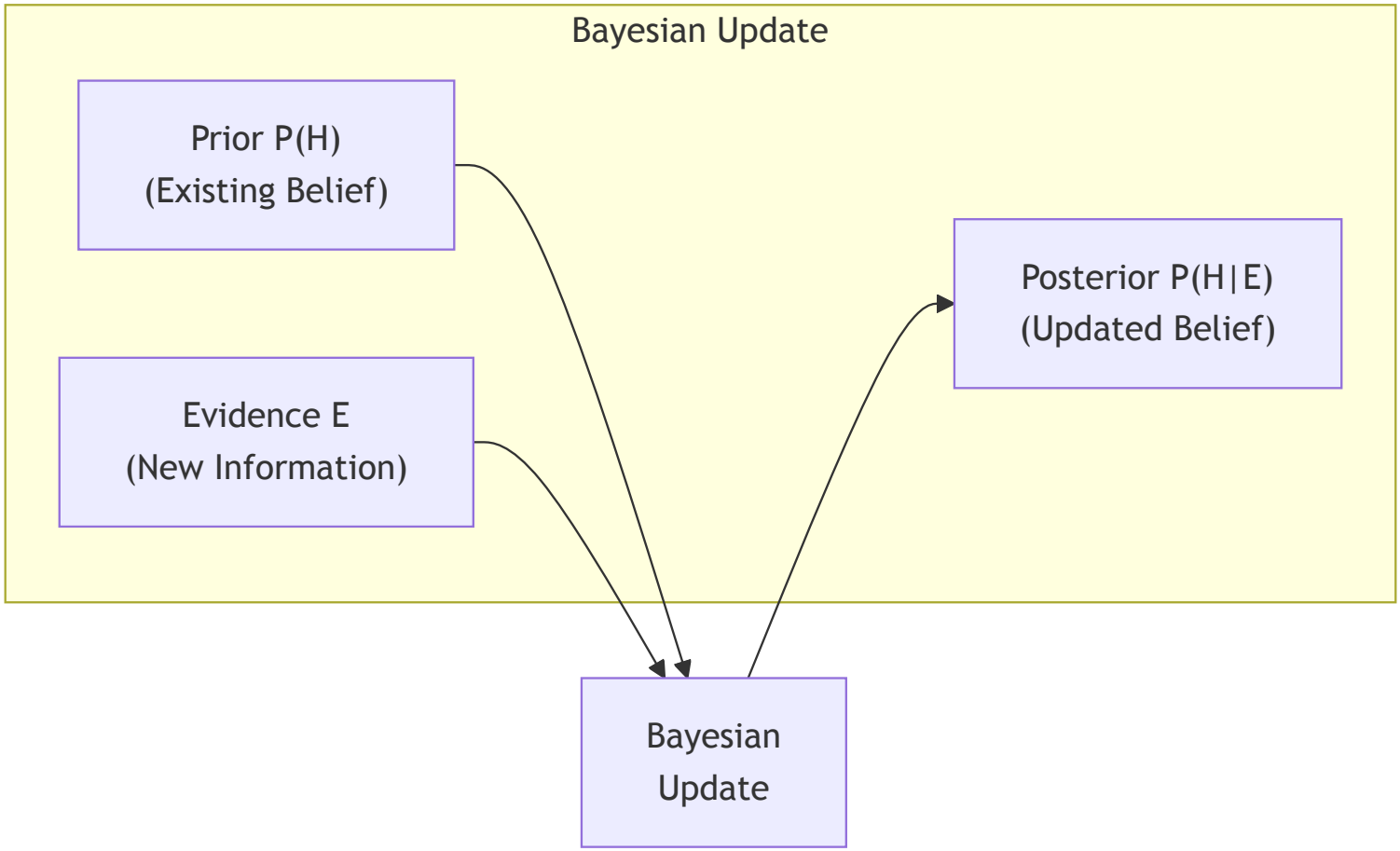


Diagram 18

Bayes Theorem:

```
P(H|E) = P(H) * P(E|H) / P(E)
       = P(H) * P(E|H) / [P(H)*P(E|H) + P(!H)*P(E|!H)]
```

Simplified:

```
P(H|E) = P(s1) / (P(s1) + P(s2))
```

Where: - H = Hypothesis (belief) - E = Evidence (observation) - s1 = Support for hypothesis - s2 = Support against hypothesis

Slide 21: Community for Innovation & Excellence

Emergent Social Dynamics

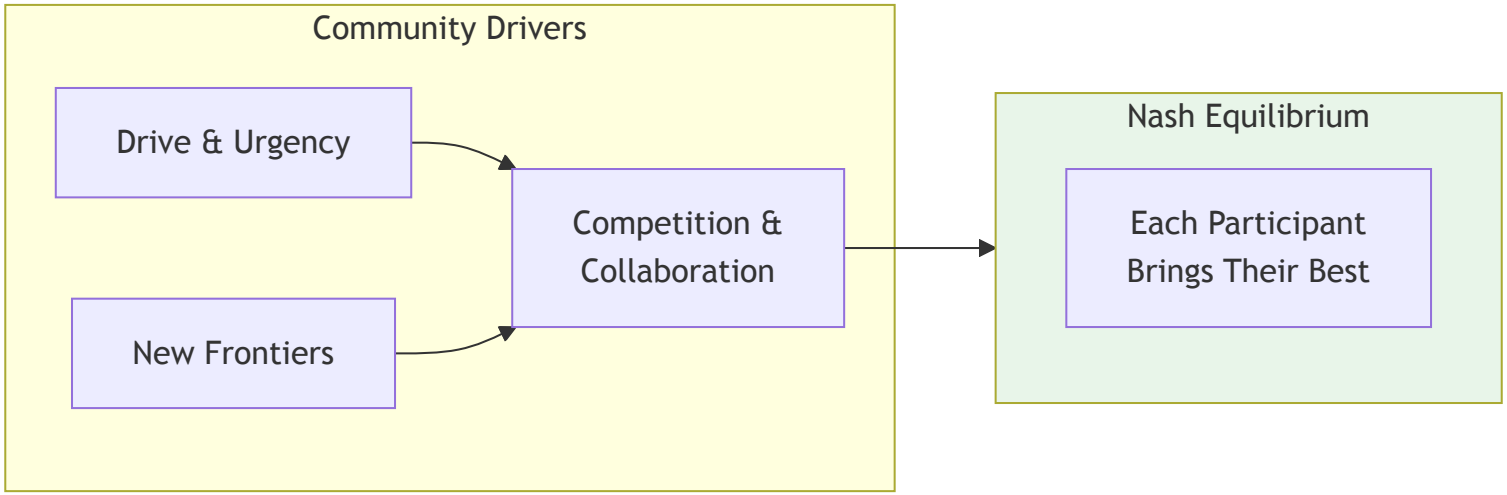
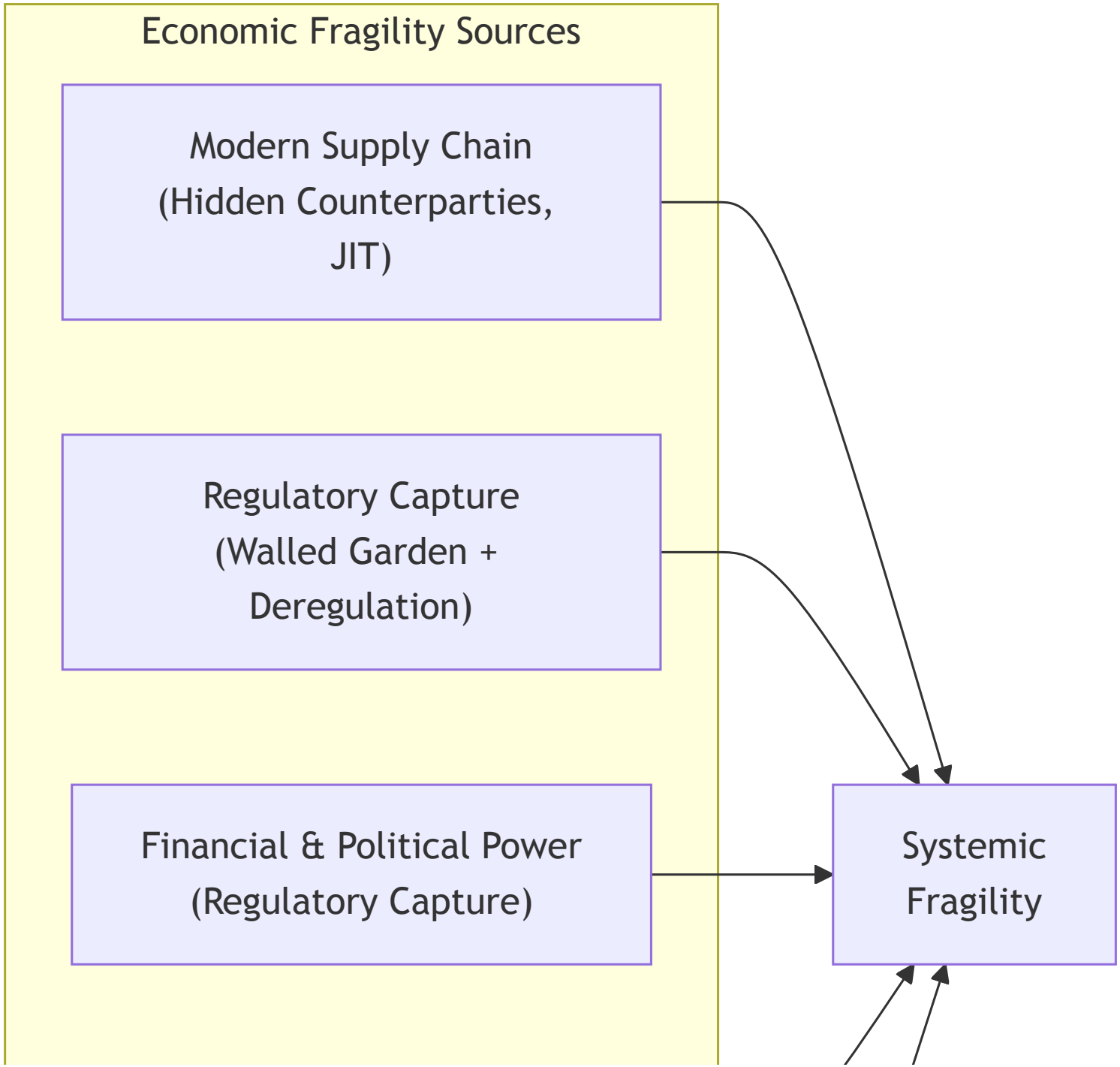


Diagram 19

Community Dynamics: - Create drive & urgency - Create new frontiers - Competition & Collaboration lead to Nash Equilibrium - Each participant can bring their best

Slide 22: Economic Fragility

Systemic Risks in Complex Societies


Economic Fragility Sources
Modern Supply Chain (Hidden Counterparties, JIT)
Regulatory Capture (Walled Garden + Deregulation)
Financial & Political Power (Regulatory Capture)
Systemic Fragility

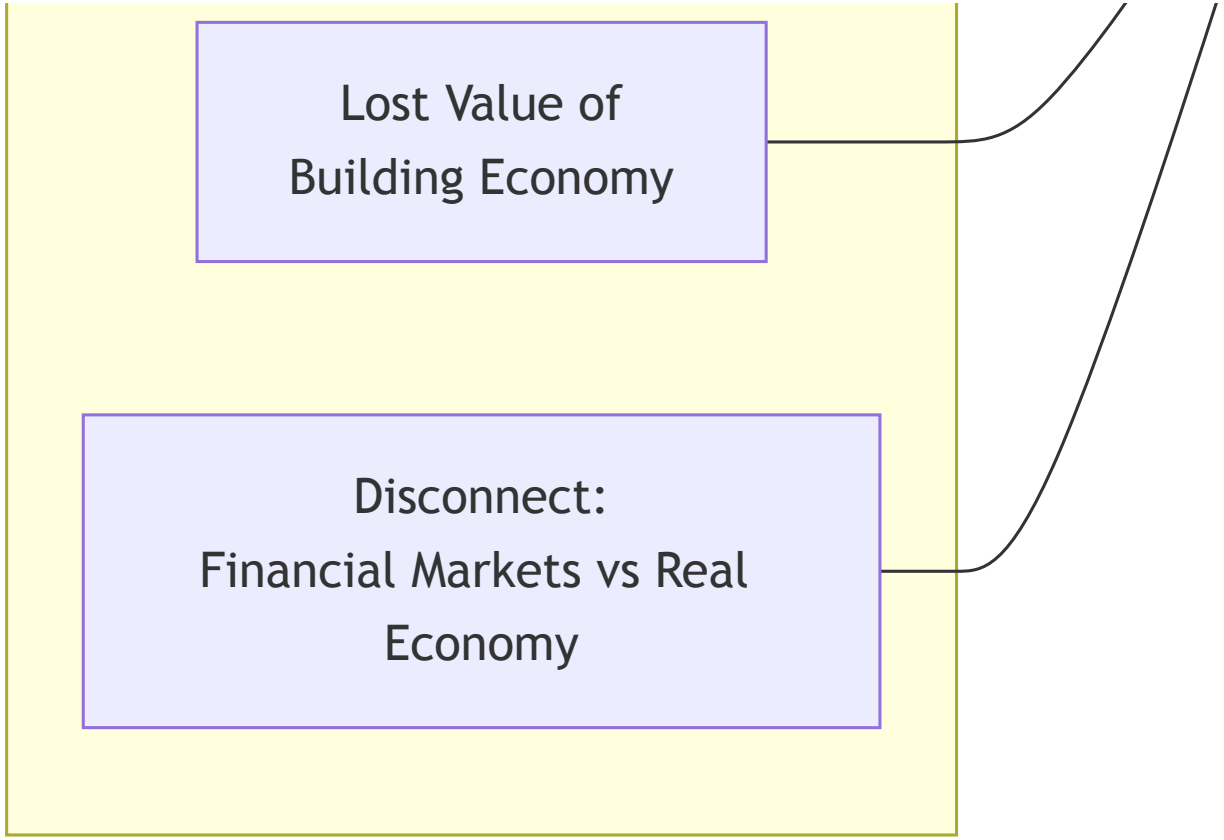


Diagram 20

Warning Signs: - Hidden explosion of counterparties in modern supply chains - Regulatory capture creating walled gardens - Disconnect between financial markets and real economy - Lost value of building vs. extracting from economy

Slide 23: Summary - The Emergence Stack

From Biology to Culture

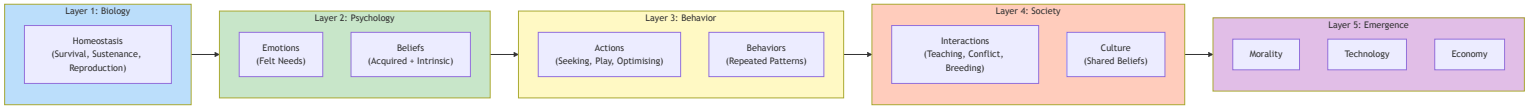


Diagram 21

Slide 24: Connection to AI SDLC

Precursor Thinking

This **Emotion Simulator** model directly influenced the AI SDLC methodology:

Emotion Simulator Concept	AI SDLC Application
Homeostasis	Requirements as living control system
Felt Needs → Actions	Intent → Requirements → Code
Belief Transmission	Context propagation through stages
Feedback Loops	Runtime feedback to requirements
Embodied Simulation	AI agent “understanding” via context

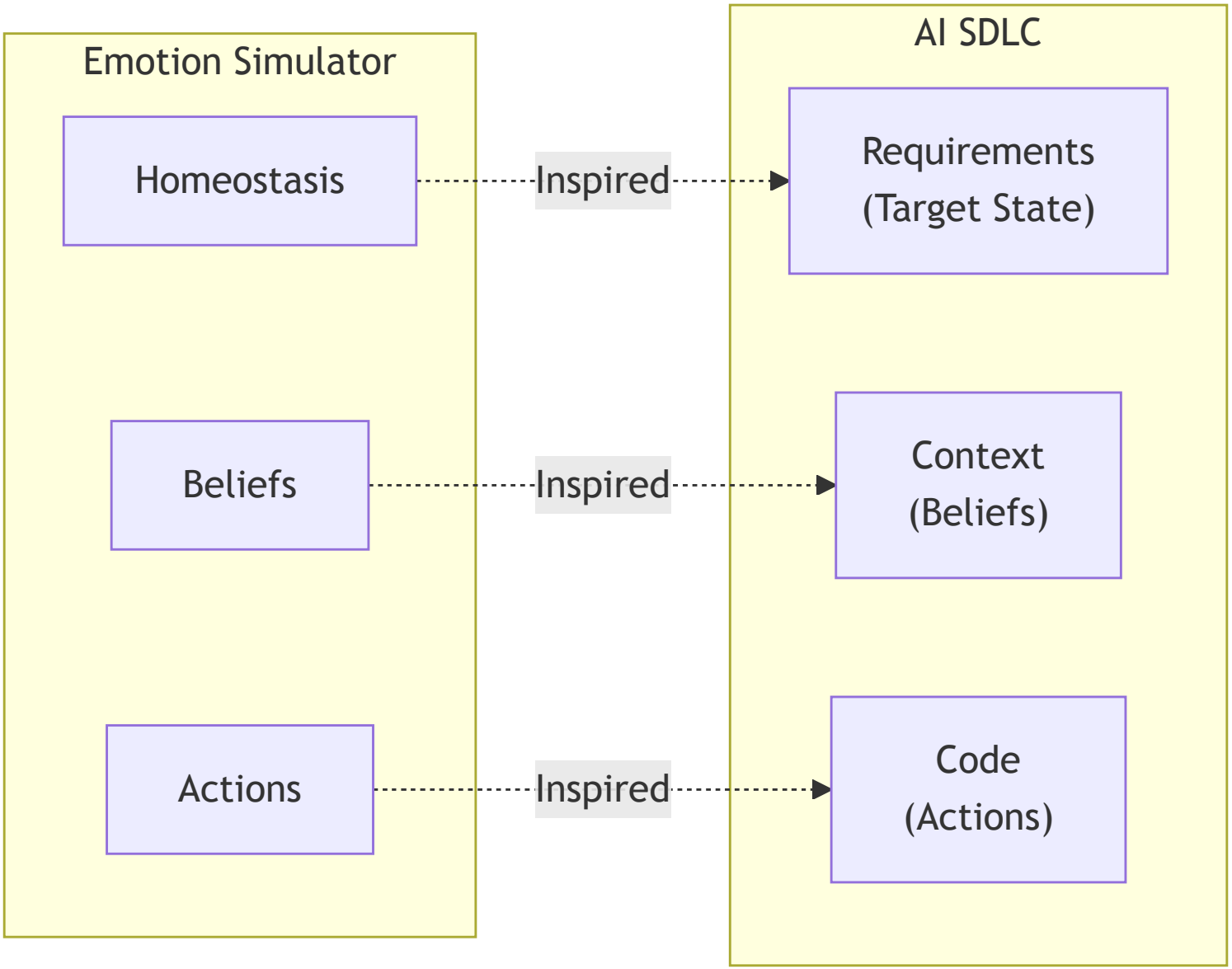


Diagram 22

The consciousness loop in AI SDLC (Builder → Executor → Observer → Evaluator) directly mirrors the homeostatic loop in biological systems.

Appendix A: Technical Stack (Historical)

MacOS M1: Apache Tensor/Spark/Hadoop

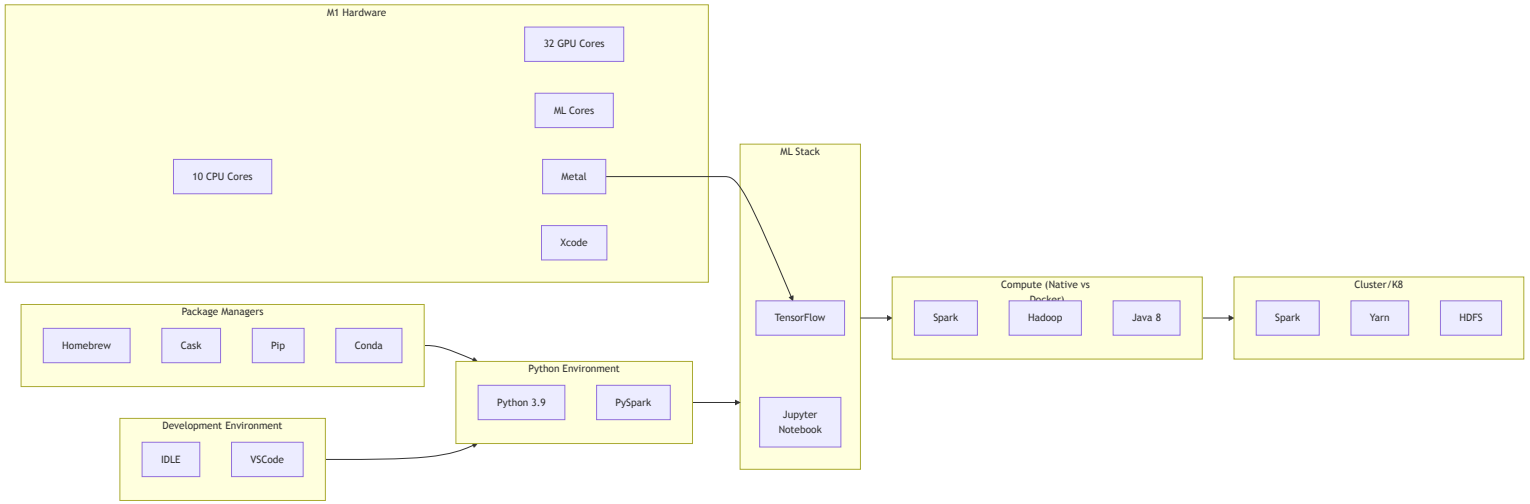


Diagram 23

References

Influences on this model:

- **Mark Solms** - *The Hidden Spring* (Consciousness from brainstem)
- **Jaak Panksepp** - Primary emotions (SEEKING, RAGE, FEAR, LUST, CARE, PANIC, PLAY)
- **Big Five Personality Model** (OCEAN)
- **Bayesian Inference** - Belief updating
- **Homeostasis Theory** - Biological self-regulation
- **Embodied Cognition** - Simulation as the basis of understanding

This presentation represents precursor thinking on emergence and biological systems that later influenced the AI SDLC methodology's homeostasis model.

Version: 1.0 **Date**: February 2026