Document 6: Anatomical Correlates Mapping

This document maps each module of the Reflective-Ethical Engine to proposed anatomical correlates in the human brain. The goal is to guide alignment with embodied cognition and identify opportunities to mimic useful neurocognitive functions.

# Configurable World Model

* Dorsolateral Prefrontal Cortex (dlPFC): planning and working memory
* Hippocampus: episodic memory and scene construction
* Orbitofrontal Cortex (OFC): reward prediction

# Perception Integration Module

* Primary Sensory Cortices (V1, A1, S1): basic input processing
* Posterior Parietal Cortex: multimodal integration
* Thalamus: sensory relay and attention switching

# Short-Term Memory

* Prefrontal Cortex: working memory buffers
* Hippocampus: temporal binding and memory indexing
* Cerebellum: prediction and short-range sequencing

# Self Model

* Medial Prefrontal Cortex (mPFC): introspection and self-reference
* Insula: interoceptive awareness
* Default Mode Network: identity continuity

# Other Model (Theory of Mind)

* Temporoparietal Junction (TPJ): perspective-taking
* Mirror Neuron System: action understanding and empathy
* Posterior Cingulate Cortex: scenario-based prediction

# Emotional State Emulator

* Amygdala: rapid affective evaluation
* Insula: integration of bodily and emotional states
* Hypothalamus: drive regulation and urgency signaling

# Planning and Action Module

* Basal Ganglia: action gating and reinforcement learning
* dlPFC: goal tracking and constraint management
* Frontal Pole: complex decision-making and ethical foresight

# Ethical Kernel v2 (Reflective Monitor)

* Anterior Cingulate Cortex (ACC): conflict monitoring
* Ventromedial Prefrontal Cortex (vmPFC): moral weighing
* Frontal Pole (BA10): meta-reflection and counterfactual projection
* Posterior Cingulate Cortex: coherence of narrative reasoning

# Temporal-Coherence Gate (MB analog)

* Mammillary Bodies: gating memory coherence
* Anterior Thalamus: routing validated episodic recall