COHERENCE™ System: Comprehensive Research Analysis

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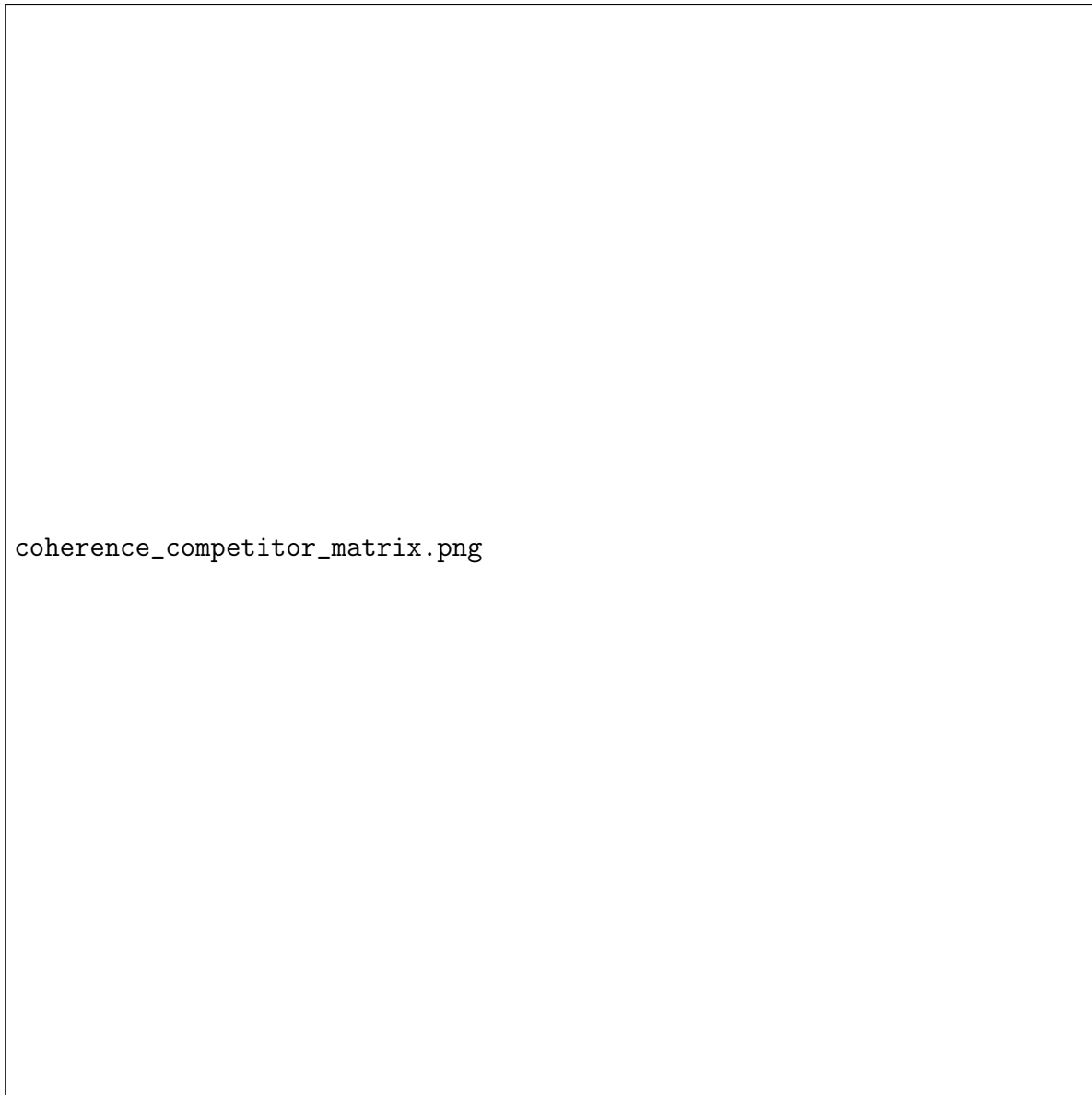
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Patent and IP Landscape

Summary of Overlaps and Novelty

- **Emotional Biometrics in Authentication**: Existing patents use emotional states to detect duress (e.g., coercion), but do not generate keys.

- **EEG-Based Encryption Keys (IBM)**: EEG-based keygen exists, but lacks symbolic integration and multi-modal collapse logic.

- **HRV-Based Biometrics (HeartMath)**: HRV coherence is used for wellness but not cryptography.

- **Adaptive ID Protocols (Google CBID)**: Continuous auth exists, but lacks emotional collapse boundaries.

Novelty: COHERENCE combines HRV & EEG synchrony, ephemeral keygen, symbolic state validation $h(t)$, and trauma-based key collapse $\mathrm{curl}(\mathcal{E}) > \epsilon$.

Competitor Matrix

coherence_competitor_matrix.png

Key Differentiator: No competitor uses emotional synchrony + symbolic AI + cryptographic collapse.

Clinical Pathway

- **Regulatory Path**: If marketed for mental health, likely Class II FDA *SaMD*; otherwise, wellness exemption.

- **Clinical Trial Design**: Validate Δ_c, λ, $\text{curl}(\mathcal{E})$ via HRV/EEG mapping in PTSD patients.

- **Precedents**: NightWare (FDA-cleared Apple Watch PTSD tool) sets useful regulatory precedent.

- **Privacy Alignment**: Ephemeral keys, no raw data storage $\Rightarrow HIPAA/GDPRaligned.$

Symbolic AI Differentiation

- **What is Symbolic AI Here?** $h(t)$ is a context vector: grief $\Rightarrow lower\Delta_c$, faster memory decay $\beta \uparrow$.

- **Technical Novelty:** No other biometric crypto uses symbolic cognition for entropy modulation.

- **Explainability:** Symbolic decisions $\Rightarrow auditablelogic \Rightarrow trauma - safesystemtuning.$

Ethical Differentiation

COHERENCE vs Exploitative Emotion AI:

- **COHERENCE:** *Shuts down under trauma, never stores raw affective states, uses physiological "yes" as consent.*

- **Exploitative AI:** Sells vulnerability, manipulates emotion for attention $\Rightarrow violatesagency.$**Privacy** : $Noemotionaldossier.NopersistentID.Session = nowonly.$

Conclusion

COHERENCE™ is a cryptographic and ethical architecture for secure, trauma-aware identity. Symbolic, somatic, and spectral. If validated, it establishes a new category of consent-centered biometric cryptography.

Quote:

- *T̈rust is not stored—it is a phase alignment, where heartbeats and spinors sing the same transient key.¨*