VERN AI: PATENTED EMOTION DETECTION SPECIFICATION

PROPRIETARY MATHEMATICAL FRAMEWORK & ALGORITHMIC MOAT

Inventors: Craig Tucker, Bryan Novak

Intellectual Property: US Patent 11,138,387 / 11,791,995

Executive Summary

While commodity competitors rely on broad, uncalibrated Large Language Model outputs, VERN AI relies on a deterministic, mathematically grounded algorithmic pipeline protected by core federal patents. Our technology extracts, parses, and quantifies structural communication metrics in real time. This brief defines the exact mathematical routing that shields VERN OS from the common limitations of open APIs, high latencies, and platform dependencies.

The Origin Narrative: From Discovery to Enterprise Scale

In 2016, operating as **THiNC. Technology**, our engineering team developed a production-grade, web-native, stateful conversational framework in PHP to power a landmark series of digital interaction and deception experiments led by Dr. Saleem Alhabash at Michigan State University (MSU).

While academic peers and contemporary tech firms were drafting theoretical flowcharts or expanding basic keyword dictionaries, THiNC. delivered an active, concurrent system to stress-test human perceptual boundaries. The most significant data generated by this collaboration was not a simple academic statistic, but a critical engineering epiphany:

> ***The Emotion Gap Isolated:*** *The PHP conversational framework was logically, structurally, and conversationally perfect. Yet, when live human subjects interacted with it, the conversational illusion broke rapidly. Humans did not expose the automation due to factual errors; they flagged it because it was emotionally flat. The absence of contextual emotional awareness—the ability to perceive hesitation, frustration, and tone—triggered what we defined as the Suspicion Arc.*

This discovery redefined our entire architectural roadmap. We isolated the precise variable that the rest of the technology sector omitted: **conversational intelligence cannot be solved solely by scaling information density; it requires the quantification of emotional subtext.**

Patented Algorithmic Pipeline Architecture

According to the patented infrastructure developed by Craig Tucker and Bryan Novak, the raw input message is transformed sequentially through a structured, multi-lens parsing architecture rather than a generic prompt vector layer:

Step 1: Structural Tokenization & Part-of-Speech (POS) Labeling

Upon receiving an input message, the engine automatically isolates linguistic structures, mapping every word into a defined Part-of-Speech set (S_{POS}) and establishing a structured Bag-of-Words (B_{OW}) matrix.

Step 2: Core Incongruity Filtering via Localized Knowledgebase

Instead of using semantic approximation vectors, the engine references a deterministic knowledge base to compute an **Incongruity Score** (I_{score}) across structured word groupings. This maps prediction error and isolates contextual nuances such as sarcasm, tension shifts, or humor that standard sentiment engines misinterpret.

Step 3: Multi-Lens Layered Aggregation

The engine applies structural "lenses" simultaneously to calculate preliminary emotion indicators across basic neuroscientific affective states (including Euphoria, Dysphoria, and Fear):

- **Contextual Clue Matrix:** Evaluates surrounding thematic strings to establish a localized thematic baseline.
- **Frame of Reference Module:** Quantifies standard structural communication paths relative to the receiver's profile.
- **Personal Frame Moderation:** Applies a tailored adjustment profile to isolate and neutralize individual communication anomalies.

The Core Emotion Scoring Function

The proprietary breakthrough relies on a multi-stage math loop that calculates a continuous **Preliminary Emotion Score** (P_{score}) tracking specific "emotives" (words or phrases embedded with explicit emotional intent), yielding a base confidence matrix graded from 0 to 100.

The system then calculates the definitive **Final Emotion Detection Score** (F_{score}) by routing the preliminary confidence vector through the targeted incongruity multiplier:

$$F\_score = \Phi(P\_score, I\_score) \times \prod \mu\_k(F\_personal)$$

Where Φ defines the integration function resolving the relationship between structural emotives and calculated prediction errors, and μ_k acts as the real-time damping coefficient governed entirely by the localized target frame module.

Architectural Lineage & Technical Moat

Technical Layer	The Commodity Wrapper	VERN Patented Architecture
Linguistic Processing	Opaque, non-deterministic token space maps; prone to drift and hallucinations.	Deterministic **Part-of-Speech (POS) Sets** and structural incongruity screening.
Contextual Awareness	Context dependent on massive multi-turn conversation windows (high token tax).	Real-time tracking of **Emotional Velocity** and prediction errors via an internal knowledge base.
Intellectual Property	Zero proprietary claims. Fully dependent on underlying model providers (OpenAI, Anthropic).	Protected under active US Patents **11,138,387** and **11,791,995**.

> ***Strategic Summary for Stakeholders:*** *VERN AI holds foundational, patented technology developed long before the current AI hype cycle. By converting language into predictable, algebraic emotional telemetry, VERN OS allows enterprise networks to govern massive generative models with pinpoint accuracy, zero token waste, and unmatched speed.*

Citations

1. Intellectual Property & Patent Filings
Tucker, C., & Novak, B. (2021). *System and method for analyzing communication data to detect emotion* (U.S. Patent No. 11,138,387). U.S. Patent and Trademark Office. https://patents.google.com/patent/US11138387B2/en

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2. Empirical Datasets & Proprietary Infrastructure

Alhabash, S., & MAP Lab Cohorts. (2017). *Unpublished internal lab data and PHP conversation framework matrix deployments* [Proprietary dataset and technical infrastructure]. Department of Advertising and Public Relations, Michigan State University.

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