Dr. Nicole Lunan

NVIDIA Inception Member | Elevate Ventures Backed | AWS Grant Recipient

AI SYSTEMS ARCHITECT • PHD IN ORGANIZATIONAL PSYCHOLOGY • FOUNDER & CEO

Indianapolis, IN • nicolelunan@moodjisports.com • moodjisports.com • nicolelunan.com

• 12+ Years Affective Computing & Applied Systems

Research & Engineering Profile: Systems-level AI architect and behavioral scientist specializing in continuous dynamic alignment, affective computing, and agentic evaluation architectures. Combines doctoral research in trait emotional regulation and human performance with 12 years of proprietary production software engineering. Accepted into NVIDIA Inception; backed by $75K+ in institutional pre-seed capital (Elevate Ventures) and AWS cloud grants. Founder of MoodJi Inc. (consumer affective infrastructure, 274K+ downloads, 400K+ data points) and MoodJi Sports Inc. (predictive high-performance analytics, 83–85% pilot accuracy). Currently formalizing the *VENTRALIS / RDB-Eval* framework to measure and govern state drift in autonomous AI systems.

CORE RESEARCH & APPLIED SYSTEMS EXPERIENCE

Founder, CEO & Lead Architect | **MoodJi Sports Inc.** 2024 – Present | Indianapolis, IN

High-Performance Predictive Analytics, University Deployments & Delaware C Corp

- **Institutional Financing:** Secured $50,000 pre-seed investment from Elevate Ventures and $25,000 Amazon Web Services (AWS Activate) cloud compute grant following competitive technical and IP diligence.
- **Empirical Collegiate Validation:** Designed and conducted a 6-week controlled pilot with 24 collegiate track-and-field athletes prior to national championships; achieved **83–85% predictive accuracy** in forecasting performance and burnout collapse.
- **Industry Partnerships & Integration:** In active enterprise partnership discussions with **CoachMePlus** to integrate MoodJi's affective telemetry and recovery algorithms into their athlete performance management platform.
- **Enterprise Athletic Platform:** Engineered complete multi-tenant ecosystem including athlete mobile app (React Native), coach intelligence dashboard, and real-time stress/recovery monitoring pipelines.
- **Modular MoodJi SDK:** Architected a lightweight, stateless integration package enabling external collegiate athletic departments and health systems to embed proprietary affective analytics.

Founder & Chief Executive Officer | **MoodJi Inc. / MoodMe** 2018 – Present | Indianapolis, IN

Foundational Affective Computing Infrastructure & Consumer Scale

- **Proprietary AI Engine Suite:** Conceived and directed the architecture of 14 proprietary processing engines from scratch, including sentiment scoring, state frequency mapping, behavioral collapse forecasting, and crisis detection.
- **Consumer Scale & Acquisition:** Scaled platform to **274,000+ downloads** across iOS and Android with 91,000+ organic acquisitions via proprietary ASO and design systems.
- **Longitudinal Affective Corpus:** Collected and governed 400,000+ real-world emotional check-ins across 150 countries; curated the canonical 28-family MOODME taxonomy and 160 collision-free 8D relational-value signatures.
- **LLM Orchestration Layer:** Integrated Claude API (Anthropic) and GPT-4o into conversational reflection chat (*MoodJi Love*), binding generative dialogue to structured emotional state spaces.

TECHNICAL ARCHITECTURE & ENGINEERING STACK

Domain	Core Technologies & Methodologies
AI & Dynamical Modeling	Claude API (Anthropic), GPT-4o, Custom NLP Pipelines, Dynamical Systems Modeling, 10D Phase Space Analysis, Potential Well Formulation, Lyapunov Stability Verification
Full-Stack & Mobile	React, React Native, TypeScript, JavaScript, Node.js, Express, Python, RESTful APIs, WebSockets, GraphQL, AsyncStorage, Offline-First Architecture
Data & Cloud	MongoDB, PostgreSQL, Redis, AWS (S3, Lambda, Bedrock), Docker, GitHub Actions CI/CD, Singular Attribution SDK, ResonaWeave Matrix Pipeline (93 variables)
Design & Product	Figma Design Systems, High-Fidelity Prototyping, ASO Optimization, Accessibility Compliance, End-to-End Product Lifecycle Architecture

DOCTORAL RESEARCH & APPLIED BEHAVIORAL SCIENCE

Doctor of Psychology (PsyD) in Organizational Psychology | **California School of Professional Psychology** 2021 | Los Angeles, CA

Alliant International University • Dissertation: Emotion Regulation: A Mediator Between Trait Mindfulness, Subjective Well-Being and Burnout

- Conducted foundational empirical research establishing emotion regulation as an active structural mediator preventing cognitive and physical burnout under sustained performance demands.
- Developed quantitative statistical models evaluating the interaction between trait mindfulness, subjective well-being, and systemic burnout—forming the theoretical basis for current out-of-band AI safety telemetry and stability barriers.
- Leveraged 17 years of elite athletics domain knowledge to pioneer multi-factor strain monitoring in high-stakes organizational and competitive environments.

FRONTIER AI ALIGNMENT & EVALUATION RESEARCH

Principal Investigator | **VENTRALIS Research Program & RDB-Eval Benchmark** 2024 – Present

Continuous Geometric Control, Boundary Preservation, and Agentic Evaluation for Frontier LLMs

- **RDB-Eval Benchmark Design:** Architected an evaluation framework measuring relational value drift (D_{rel}) and purpose drift (D_{soul}) under multi-step adversarial prompt pressure and authority manipulation.
- **Continuous Phase-Space Physics:** Formalized internal agent state tracking within a 10D phase space ($\mathbf{s} \in \mathbb{R}^5, \mathbf{v} \in \mathbb{R}^5$), employing potential energy landscapes ($V(\mathbf{s})$) and Rayleigh dissipation damping to prevent sycophancy and cognitive thrashing.
- **Audited Empirical Atlas:** Compiled and structured a 442-state empirical coordinate atlas across 91 machine telos operators, establishing orthonormal projection boundaries ($\mathbf{P}_{\text{sov}}$) for guaranteed invariant enforcement.
- **4-Agent Cohort Testing Protocol:** Designed Experiment 001, providing falsifiable evaluation metrics for out-of-band monitoring across standard prompted baselines versus closed-loop geometric governance.

PROPRIETARY FRAMEWORKS & SOFTWARE ASSETS

14 Proprietary AI Engines
Production-tested algorithms for NLP sentiment scoring, emotional trajectory modeling, early crisis identification, and longitudinal state recovery analytics.

Emotion.Equations™ Framework
Mathematical apparatus converting qualitative affective states into bounded continuous metrics, establishing invariant bounds for automated decision systems.

Collapse & Burnout Prediction Models
Validated predictive formulas detecting cumulative friction and strain prior to functional collapse, proven in collegiate athletics and corporate wellness.

Modular MoodJi SDK
Lightweight, stateless integration library designed for white-label embedding across third-party mobile applications and high-throughput web dashboards.

EDUCATION & PROFESSIONAL AFFILIATIONS

Doctor of Psychology (PsyD) | **Alliant International University, Los Angeles** Conferred 2021

California School of Professional Psychology • Focus: Emotion Regulation, Mindfulness & Performance Systems

Capitalization, Corporate Governance & Institutional Honors:

- **Elevate Ventures ($50,000 Pre-Seed):** Awarded institutional pre-seed venture financing for MoodJi Sports Inc. following state-level technical and market vetting.
- **Amazon Web Services ($25,000 Cloud Grant):** Secured AWS Activate infrastructure grant supporting high-throughput longitudinal data pipelines and ML architectures.
- **Enterprise Pipeline:** Active integration discussions with CoachMePlus for deployment across collegiate and professional athletic networks.
- **Corporate Leadership:** Founder & CEO of MoodJi Inc. and MoodJi Sports Inc. (Delaware C Corporations registered in Indiana).
- **NVIDIA Inception Program:** Selected member recognized for proprietary AI architecture, emotional computing engines, and mathematical modeling.