Overview

Vivum AI is a veteran-owned small business located in the HUBZone of Bloomington, Indiana. Vivum focuses on applied and unconventional Artificial Intelligence (AI) research for next-generation solutions. With over 100 years of experience, Vivum is composed of technology and business leaders with world-class pedigrees from Harvard, Indiana University, NASA, SpaceX, Lockheed Martin, the U.S. Navy and Marine Corps, and The White House. Our technical team possesses PhDs in Cognitive Science, Psychological Brain Sciences, and Informatics and has pushed the state-of-the-art in autonomy and cognition research in support of NASA and the U.S. Navy.

Vivum's Solution: Evolutionary AI (E-AI)

Vivum has created a next-generation computing platform rooted in natural neural circuitry to emulate the human brain's information-processing mechanisms. This approach has yielded ultra-efficient (neuromorphic) processors (virtual, emulated, and physical) that work with traditional Artificial Intelligence tasks and models that dramatically curtail energy consumption and alleviate computational bottlenecks.

The Science

Innovation Rooted in Nature: Vivum's approach is not only inspired by but closely mirrors the human brain's complex information processing abilities.
Traceable and Reliable AI: Vivum Evolutionary AI isn't a black box - it's a transparent glassbox - leveraging truly explainable causal models and methods.
Energy-Efficient and Powerful: Our technology unlocks continuous-time-based AI tasks and does so with unprecedented energy efficiency, conforming to the strictest of SWaP constraints.
Scalable Edge Inferencing: Vivum's technology revolutionizes AI inferencing by enabling the scalable execution of complex models and tasks on edge devices, a feat unattainable with traditional AI methods like deep and reinforcement learning.

Applications in Artificial Intelligence

Unmanned Autonomous Systems: we are bringing autonomy to all classes of unmanned vehicles: UMVs, UUVs, UAVs, UGVs.
Dynamic Neural Modeling: Vivum AI is a pioneer in dynamic neural models (e.g., CTRNNs and LTCs), which differ fundamentally from static neural models due to their exceptional adaptability and robustness to noise.
Evolvable Hardware: leveraging artificial evolution to design, configure, and optimize system capability.
Autonomy Integration: we bring legitimate and explainable autonomy through seamless integration of existing infrastructure.
Seamless Integration with Existing Infrastructure: The Vivum system does not require specialized hardware. Our IP core can be updated over the air into any machine or vehicle equipped with a standard FPGA.

Dynamic Learning: The Core of Vivum's Innovation:

- **Empowering AI with Transparency:** Our Continuous-Time Recurrent Neural Networks (CTRNNs) simulate the brain's dynamic nature and offer a window into AI decision-making, unlike conventional 'black box' networks.
- **Liquid Time-constant Networks: Beyond Efficiency to Explainability**: These networks can be deconstructed into decision trees, transforming AI from a mysterious black box into a transparent, traceable system.

Past Performance

2019 NASA SBIR - Continuous Time Recurrent Neural Networks in Evolvable Hardware (CTRNN-EH)

- Demonstrated the feasibility of leveraging CTRNNs evolved on Field Programmable Gate Arrays (FPGAs) to forge highly compact, energy efficient, fault-tolerant adaptive neural circuits.
- Paved the way for our core IP, which is a non-Von Neumann neural architecture that is highly adaptive and drastically reduces energy consumption and computational bottlenecks, redefining the possibilities for autonomous vehicles, edge computing/IoT, and advanced robotics among many others.

For more information, please visit our updated website https://vivum.ai/

CAGE/NCAGE: 9TSL9 | Certifications: HUB Zone, VOSB
Corporate Office: 642 N. Madison St., Suite 112, Bloomington, IN 47404

Vivum Leadership

Aldo Carrascoso, MBA. CEO and Co-Founder. 25-year Tech Entrepreneur. Vast experience building, growing, and scaling global technology teams. 4 companies, several exits generating >$1B in value: 1) Verego, 2006 – CTO - Algorithmic B2B matchmaking through statistical analysis. 2) Jukin, 2009 – CTO - UGC digital media via cloud computing. 3) Veem, 2013 - COO/CTO - Financial technology and payment solutions leveraging blockchain and machine learning. 4) InterVenn, 2016 – CEO - Liquid biopsy cancer detection and next-generation disease treatment utilizing glycoproteomics and AI. Co-founder Carolyn Bertozzi received the Nobel in 2022. https://en.wikipedia.org/wiki/Aldo_Carrascoso

Derek Whitley, Ph.D. CTO and Co-Founder. US Navy Veteran, CTM2 ESWS. 15-year Research Scientist, AI. Engineer, Entrepreneur. 2x CTO: Flamel.ai (2023). Director of AI: MetroStar (2021) Chief Science Officer: Warrant Technologies (2018). Supported NASA Glenn Research Center Cognitive Communication research. SWaP-space, weight, and power efficient deep space radio communication. Naval Surface Warfare Center Crane. Applying AI/ML for national security threats, including cybersecurity, trusted microelectronics, autonomous robotics, and drone warfare. Indiana University, Bloomington: dual PhD in Complex Systems and Cognitive Science. Rose-Hulman Institute of Technology - Visiting assistant professor.

David Kalinske, Vice President of Defense & Strategic Applications. Endorsed by two U.S. Presidents, Mr. Kalinske is a Harvard & UCLA alumnus and former National Security Fellow. He was the White House Aide to President Bush and President Obama directly responsible for America's nuclear codes and the associated emergency action teams. A recipient of the Defense Superior Service Medal for meritorious service in the position of significant national responsibility, he is a TOPGUN graduate whose government service includes combat operations as a fighter pilot and Miramar-based fighter squadron Commanding Officer. He has served in various executive-level capacities in the tech, aerospace, manufacturing and space industries. Vast executive leadership experience in operations, business development, P&L management & corporate strategy.

CJ Meurell, Vice President of Business Development An experienced international sales and business executive, adept at driving innovation in high-tech markets and engaging C-level decision-makers to enhance shareholder value and achieve substantial financial results, combines entrepreneurial zeal with extensive global business acumen. Specializing in mobile broadband, connected vehicles, telematics, and SaaS models, with a proven ability to lead startups, manage P&L, execute M&A strategies, and develop teams within emerging technology sectors.

Justin Slattery, Ph.D. Director of Artificial Intelligence & Applied Ethics An accomplished interdisciplinary researcher with expertise in AI ethics, evolutionary systems, swarm dynamics, and autonomous navigation. He holds a dual PhD in Cognitive Science and Philosophy of Science from Indiana University, Bloomington. Before Vivum, Justin was a Senior AI Research Scientist at Exonus LLC, where he managed federal grant projects and developed autonomous navigation and swarm dynamics solutions for NASA and the NSF. He has collaborated with diverse teams and bridges the gap between sciences and humanities in his work.