Part 1: Concept White Paper TECH|SEARCH 9

Basic Information	
Company Name: REDACTED	
Proposal Title: AI-Powered Mixed-Reality Combat Simulator for Close Quarters Battle	
TRL: REDACTED	**Location:** REDACTED
Number of Employees: REDACTED	**Previous DOD Business:** No
Capital Raised Total: REDACTED	**Website:** https://REDACTED
Primary Contact Name: REDACTED	**Primary Contact Email:**
Secondary Contact Name: REDACTED	**Secondary Contact Email:**

Part 1: Introduction/Abstract (5%)

The U.S. Army is rapidly pivoting from counter-insurgency scenarios of the post-9/11 era toward the hard realities of a potential high-intensity fight with peer competitors such as China or Russia. Yet most legacy simulators still recycle Global War on Terror (GWOT) playbooks. Static "screen caves," predictable role-players, and pre-scripted scenarios do little to rehearse soldiers for modern combined-arms tactics, drone-enabled reconnaissance-strike complexes, or distributed electronic warfare. This gap leaves Brigade Combat Teams without a low-cost, scalable way to practice against the very TTPs they are most likely to face on Day 1 of large-scale combat operations. REDACTED Technologies' ***REDACTED*** closes that gap. REDACTED fuses weapon-mounted sensor packs, an edge-enabled AI engine, and immersive mixed-reality headsets to overlay live-fire ranges or shoothouses with adaptive virtual enemies that behave exactly like current Russian or PLA maneuver elements. The adversary models are trained on hundreds of hours of battlefield footage from Ukraine and other near-peer engagements, keeping pace with emerging threat data. Within 15 minutes of arriving on site, a squad can step into a full-spectrum fight, CQB, trench assault, or small-UAS attack, while REDACTED records every trigger pull, angle, and decision and feeds real-time coaching back to each soldier. Because REDACTED is weapon-agnostic, infrastructure-light, and ammunition-free, units can rehearse as often as needed at a fraction of force-on-force costs, driving a documented 25 % gain in marksmanship accuracy and 40 % faster reaction times during pilot events. By combining immersive hardware and AI-generated immersive software, REDACTED delivers a live, learning, threat-accurate training environment that directly boosts Soldier lethality and readiness for tomorrow's peer fight.

REDACTED IMAGE

Above: *The REDACTED pairs lightweight weapon-mounted sensors with AI-driven virtual adversaries to overlay any live-fire range or shoothouse with threat-accurate, near-peer tactics. Squads can rehearse modern combined-arms fights on demand, without ammunition costs and logistical limiting factors, while capturing every action for instant coaching and measurable gains in lethality.*

Part 2: Army Benefits (25%)

Solution's advantage. Traditional systems like VirTra's screen-based simulators require expensive proprietary hardware, limit Soldier movement, and rely on predictable pre-scripted scenarios. REDACTED's REDACTED uses universal weapon-mounted sensors that work with any standard-issue firearm, deploy in under 15 minutes without fixed infrastructure, and cost 50% less than force-on-force exercises while eliminating ammunition expenses. The system's AI

adversaries are trained on real combat data from Soldier-worn GoPro cameras and other inputs from current conflict zones, like Ukraine. This provides dynamic opposing forces that reflect actual near-peer adversary TTPs that role players and traditional training venues cannot. While legacy simulators present the same scenarios repeatedly, REDACTED generates infinite variations based on emerging battlefield intelligence, ensuring training remains relevant to actual threats.

Solution's Impact. REDACTED improves Soldier lethality. Field testing demonstrates 25% improvement in marksmanship accuracy, 40% faster reaction times under stress, and 95% system uptime in austere conditions. REDACTED supports up to 20 simultaneous trainees with real-time performance analytics, enabling commanders to identify skill gaps and optimize training allocation. This scalability addresses the Army's challenge of maintaining readiness across geographically dispersed forces while managing costs and logistical complexity. The solution advances the **Immersive & Wearables priority technology ecosystem**. Specifically, it advances both the **Immersive Hardware** and **Immersive Software core components.** It is a mixed reality augmented and virtual reality capability that improves Soldiers marksmanship, particularly in CQB environments against Russian infantry. The AR/VR/MR hardware includes haptic feedback that simulates realistic combat scenarios. The software trains Soldiers on realistic near-peer adversary TTPs that current simulators are unable to. The result is improved Soldier lethality and an Army that is better prepared to face near peer adversaries in a direct conflict.

Degree of Innovation. REDACTED's approach is a revolutionary departure from existing training paradigms by combining real-time sensor analytics, combat data-trained AI, and mixed-reality environments into a single platform. Traditional training systems treat these as distinct capabilities, but REDACTED integrates all three simultaneously, creating emergent training benefits that exceed individual components. The innovation lies in the fundamental training philosophy: instead of Soldiers adapting to training systems, REDACTED adapts to Soldiers and evolving threats. This represents the first training platform that learns from real combat data and continuously improves its effectiveness, positioning the Army ahead of peer competitors who rely on static training methodologies developed for previous conflicts

Part 3: Technical Approach (40%)

Scientific Feasibility. The REDACTED is built upon three proven scientific foundations that address documented Army training deficiencies. The system leverages advanced IMU technology housed within modified PEQ-15 casings to capture precise weapon movement data, feeding into proprietary waveform detection algorithms that differentiate between live fire, dry fire, and reload sequences with 95% accuracy, validated through field testing with Ukrainian combat forces. The AI component utilizes machine learning models trained on over 200 hours of real combat footage from current conflicts, creating adaptive adversary behaviors that respond dynamically to trainee actions. Unlike traditional simulators that suffer from the documented "gap between simulation and reality," our AI continuously learns from actual combat engagements. The mixed-reality integration addresses cognitive overload issues identified in Army VR assessments by maintaining physical environment awareness while overlaying digital threats and analytics.

Enabling Technologies. The core enabling technologies present minimal risk due to our use of commercially proven components integrated through innovative software architecture. Our IMU sensors utilize military-grade hardware that meets IPX7 standards and withstands weapon recoil. The critical innovation lies in our AI processing engine, which combines edge computing for real-time decisions with cloud-based learning for continuous improvement. Our haptic feedback integration provides realistic weapon recoil simulation without requiring specialized ammunition, eliminating the cost and logistical barriers documented with simulation-based training systems.

Technical Team. Our leadership combines advanced academic credentials with direct combat experience. CEO REDACTED holds an MPA from Harvard Kennedy School and brings USAF veteran experience plus previous success developing AI-powered VR therapy systems. CPO REDACTED completed MIT's Full Stack Development program, specializing in translating technical concepts into operational prototypes. Strategic Advisor Lieutenant General (Ret.) REDACTED formerly commanded U.S. Army RDECOM, providing insight into Army acquisition processes.

Technical Risks and Mitigation Plans. The primary risk involves ensuring AI adversary behaviors accurately represent evolving threats without creating negative transfer. We mitigate this through continuous validation with combat veterans and regular updates based on intelligence assessments. Our Ukrainian Ministry of Defense partnership provides ongoing battlefield footage and tactical feedback. Hardware durability risks are addressed through ruggedized component selection and modular design enabling rapid field replacement. Network dependency is mitigated through edge computing architecture maintaining full functionality for 150+ minutes disconnected.

Data Quality, Technical. Field validation demonstrates system effectiveness with Ukrainian ground forces reporting measurable improvements in decision-making following REDACTED training. Our sensor accuracy shows 95% correlation with manual observer scoring across diverse conditions. The system maintains 95% operational uptime during extended field testing, significantly exceeding current Army training system reliability. Real-time analytics process within 50-millisecond latency, enabling immediate corrective feedback during live exercises

Part 4: Commercial Potential (25%)

R&D to Product Revenue. REDACTED's leadership team has demonstrated proven ability to transition research into operational products with revenue potential. CEO REDACTED previously founded a healthcare startup at Harvard that successfully developed AI-powered VR therapy systems for veteran PTSD treatment, demonstrating the team's capability to commercialize complex AI and immersive technology solutions. The company has already secured a purchase order from the USAF for REDACTED prototype evaluation and has scheduled demonstrations with Michigan Police SWAT teams and the Michigan Department of Corrections for Q2 2025. Multiple Ukrainian combat units have made weekly requests for REDACTED to return with expanded training capabilities, indicating strong international demand for proven battlefield applications.

Competitive Edge. REDACTED offers proprietary AI models trained on real combat data that no competitor possesses. While VirTra, FATS, and other training companies rely on pre-scripted scenarios, REDACTED's system learns and adapts from actual battlefield engagements, creating an insurmountable data moat. The team's combination of Special Forces combat experience and advanced technical credentials from Harvard and MIT provides domain expertise that large defense contractors cannot easily replicate. Our universal sensor approach eliminates the vendor lock-in that characterizes competitor solutions, making REDACTED more attractive to cost-conscious military and law enforcement customers.

Other People's Money. REDACTED has secured $500,000 from Harvard's Xfund and is actively raising additional venture capital to accelerate commercial deployment. The company operates across three distinct market segments that provide non-DoD funding sources: law enforcement training ($5.13B market growing to 2032), VR gaming ($32.49B market growing at 21.6% annually), and private security training. Discussions are underway with gaming companies to adapt the AI-driven simulation technology for consumer applications, while law enforcement agencies have expressed interest in pilot programs for active shooter response training. These commercial revenue streams will fund continuous product improvements that directly benefit Army applications, ensuring sustainable innovation without relying solely on government contracts.