Basic Information	
Company Name	Tensor Networks
Proposal Title	SARAHAI™ A Force Multiplier for Situational Awareness
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SARAHAI™ KEEPS VALUABLE EYES ON MISSION WITH CRITICAL INFORMATION ALERTS ON TRAINED INSTANCE AND OBJECT IDENTIFICATION OF THE PERIHPERY AND REAR WITH STREAMING VIDEO ANALYTICS. SARAHAI™ THROUGH SOFTWARE DEFINED ALGORITHMS WITH OVER 80 INFERENCES CAN AUTONMOUSLY AND SIMULTANEOUSLY MONITOR HUNDREDS OR THOUSANDS OF VIDEO FEEDS AND ALERT ON TRAINED OBJECTS OF INTEREST AND DEFINED SCENARIOS BY APPLYING ARTIFICIAL INTELLIGENCE VIA CONVOLUTIONAL NEURAL NETWORKS.

SARAHAI™ is an acronym for Situational Awareness Response and Help AI. The system is inspired by the orchestrated objective reduction theory. SARAHAI is deployable and functional now at a TRL of 5, and ready for specific use-case and application development integration.

SARAHAI™ is a video analytics and video management platform, which was initiated back in 2014. Over the years it has evolved into a stable and feature-rich video platform, which is used for video management and analytics such as machine learning.

SARAHAI™ is a collection of best practices supporting the ever-growing needs of rolling out huge amounts of video streams, requiring extreme flexibility in terms of deployment and customization, and putting strong focus on video analytics and more specific machine learning and AI.

SARAHAI™ Benefits Include:

- SARAHAI™ enables stakeholders to pay attention to ever more video feeds and sensory data points. It's easy to miss important details with information overload and it's mentally frustrating for stakeholders to pay attention for long periods of time attempting to monitor dozens of video screens. This deficit is called selective attention, and it creates a threat vector in and of itself creating vulnerability through sleight of hand tactics, and diversion of attention, or just missed opportunities. Almost all surveillance footage currently is viewed post incident and is not a preventative measure. SARAHAI™ empowers existing surveillance systems and stakeholders to be more proactive and able to prohibit and prevent situations of damage or loss.

- SARAHAI™ along with Tensor Networks' AI Ramp, and Matrix-OS³ can monitor hundreds or thousands of video streams simultaneously for over 80 trained inference models for proactive safety and security acting as a force multiplier and extending asset life cycles. Matrix-OS™ is a NIST 800-171 capable SE Linux optimization of common-off-the-shelf Rocky

Linux, and AI Ramp which is a distributed computing and parallel processing system for the clustering of SARAHAI Nodes to scale-up or scale-out processing capabilities based on workload demand.

- SARAHAI™ is a bolt-on solution to existing IP base H.264 video camera and surveillance systems. SARAHAI can also perform analytics on web-based content such as YouTube or TikTok, or archived content.

- SARAHAI™ stores structured object video content unaltered locally with accelerated edge-computing that meets chain-of-custody requirements to be admissible as evidence in a court of law. In addition, analyzed content can be archived onto the immutable Web3 blockchain via the IPFS (Interplanetary File System) for privacy and security and unquestionable chain-of-custody.

- SARAHAI™ is an open architecture system for the easy addition of new modular YOLO based inference models and sensors as needed with the utilization of common-off-the-shelf processing.

- SARAHAI™ offers a flexible deployment model that can run air-gapped, or on a private network in a private data center mobile or fixed, or in public cloud system.

SARAHAI utilizes Kubernetes for flexibility and scale

Kubernetes sits at the center of the SARAHAI Enterprise Suite. Every solution within the suite is built on top of Kubernetes, so it allows you to bring your own cloud, bring your own storage and bring your own technology.

Bring your own cloud or deploy SARAHAI on the Edge

A SARAHAI Kubernetes cluster can be deployed wherever processing needs to be closest to data (data gravity). This means you can deploy at the edge, in a private or public cloud. As SARAHAI is a modular build, you can also have hybrid deployments. For example, processing at the edge and visualisation in a cloud environment, or storage at the edge and limited storage in a cloud environment. Flexibility is the key.

Bring your own technology

Kubernetes brings a lot of advantages in terms of deployment, scalability, resilience, and high availability, but there is more. Due to the nature of Kubernetes administrators can bring any tool, service, solution or application inside their cluster. As the Kubernetes Enterprise Suite has specific dependencies, there is no need to install already existing tools, but you can reuse the ones you already have.

Next to that, all solutions within the Kerberos Enterprise Suite ships Swagger APIs by default. This allows you to extend or integrate your own solutions or extend them with the technology you already master or prefer within your organization.

SARAHAI™ Infrastructure Solutions

By leveraging common-off-the-shelf processing solutions we've built a high-performance server architecture for SARAHAI™ that delivers turn scable solutions with cluster management to 768 nodes. The SARAHAI™ compute cluster supports up to 100 Video streams and over 80 inferences per AI Ramp Core Node.

The AI Ramp Core Node is assembled in Sunnyvale, CA with meticulous quality of service and security measures. It features over 666 TFLOPS on computational capacity per node and this can scale-up or scale-out across a SARAHAI™ system architecture. With AI Ramp management tools, the system supports elastic computing in support of peak and off-peak demand. Each AI Ramp Core Node is very power efficient at up to 1600 Watts of Titanium Level power efficiency. Utilizing Matrix-OS³ empowers the customer with NIST 800-171 compliance and Web3 blockchain object storage capabilities.

For Outdoor or Mobile/Vehicle deployments SARAHAI™ utilizes an IP67 rated AI Ramp Outdoor/Indoor/Wiress mesh node supporting WiFi 6, and 5G radios as well as Ethernet backhaul, and Ethernet PoE ports to power cameras or other outdoor devices. Ideal for rugged environments and extended temperature ranges. The mesh nodes will form a peer-to-peer network for transport, and scale-out processing. Each nodes supports encrypted communications with QAT or Quick Assit Technology and run deployed with Matrix-OS, AI Ramp, and SARAHAI software.

Tensor Networks provides a complete end-end situational awareness solution that delivers artificial intelligence as a force multiplier for DoD, Smart Cities, County Emergency Operations Centers (EOC's), Emergency First Responders, States, and Utilities to reduce risk and expenses.

Figure 1 AI Ramp Core Node 4U Rack Mount Appliance >666 TFLOPS and <1600 Watts

Figure 2 IP67 DC Powered Outdoor/Mobil Node. Mil-Spec and Ext Temp Range. PoE Ethernet. Wifi 6, and 5G Network