Technical Specifications

AI Integration in Surveillance and Monitoring Systems

1. Project Overview

The objective of this tender is to provide a comprehensive solution for integrating advanced AI-driven surveillance and monitoring systems for the client's industrial facilities. The solution will encompass the following components:

- AI integration into surveillance systems.

- Thermal cameras for equipment monitoring and staff health screening.

- Facial recognition and people tracking.

- Stock yard systems for automatic stock tracking.

- Vehicle movement and counting systems.

2. Technical Requirements

2.1 AI Integration in Surveillance

- The system should support AI algorithm management and deployment across surveillance equipment.

- AI-powered features such as object detection, video classification, behavior analytics, and automatic alerts should be integrated.

- Systems must support central and edge deployment models, providing flexibility for different industrial scenarios.

- Integration with the facility's management system for event management and real-time alerts.

- AI models should be trainable using imaging data and capable of automatic parameter tuning.

2.2 Thermal Cameras for Equipment Monitoring

- High-accuracy thermal cameras with temperature measurement range from -20°C to 550°C and accuracy up to ±2°C or ±2% should be deployed.

- The system should support multiple measurement rules (point, line, frame) to ensure precise monitoring of key equipment.

- Real-time monitoring with central management capabilities to detect anomalies such as overheating, wear and tear, or failure.

- Integration with inspection systems for scheduled and real-time remote inspections.

2.3 Thermal Cameras for Staff Health Monitoring

- Thermal cameras should be installed at entrance points to monitor staff health and detect elevated body temperatures.

- Cameras should provide fast and accurate temperature screening with high throughput, ensuring minimal disruption at entry points.

- The system should support alarm notifications and integration with access control systems to manage entry based on health status.

2.4 Facial Recognition for People Tracking

- The system should include facial recognition capabilities for tracking and verifying individuals in real-time.

- Integration with the existing security systems to manage access control and track personnel movement within the facility.

- Capability to detect unauthorized access and generate alerts for security personnel.

2.5 Stock Yard Management and Tracking System

- An automated stock yard management system that uses AI and IoT technologies to track inventory levels.

- Integration with a management system for real-time updates on stock levels, locations, and movements.

- The system should include AI-powered image analysis for automatic recognition of different stock items.

- Support for 3D radar technology to monitor and measure stockpile volumes accurately.

2.6 Vehicle Movement and Tracking System

- Installation of vehicle tracking systems at key points, including entrances, exits, and weighbridge areas.

- AI-powered analytics for vehicle counting, classification, and movement tracking.

- Integration with access control and weighbridge systems to manage and log vehicle entry and exit.

- Support for ADAS (Advanced Driver Assistance Systems) to monitor driver behavior and ensure safe operation within the facility.

2.7 Vehicle Counting at Weighbridge

- Installation of high-accuracy cameras and sensors to count vehicles entering the weighbridge area.

- The system should be capable of detecting and logging vehicle details, including type, license plate, and time of entry/exit.

- Integration with central management systems to provide real-time data and alerts for operational efficiency.

3. System and Server Requirements

- **Central Server Requirements:**

- Multi-core processors with at least 64GB RAM and SSD storage for high-performance processing.

- Support for high-bandwidth data handling and storage for video and AI model management.

- Secure, scalable, and redundant storage solutions for long-term data retention and backup.

- **Edge Servers/Devices:**

    - AI-capable edge devices with integrated GPU/TPU for real-time data processing at remote sites.

    - Support for low-latency processing and event management, reducing the need for constant uplink to central servers.

    - Ability to run specific AI models tailored to the local environment and equipment.

- **Network Requirements:**

    - High-speed, low-latency network infrastructure connecting all surveillance and monitoring devices.

    - Secure, encrypted communications between all devices and central servers.

    - Redundant network paths to ensure uninterrupted service in case of primary network failure.

4. Operational and Support Requirements

- The contractor must provide a comprehensive maintenance and support plan, including:

    - Regular system health checks and updates.

    - 24/7 remote and on-site support for critical issues.

    - Training for client personnel on system operation and basic troubleshooting.

    - Documentation and user manuals for all installed systems.

5. Compliance and Standards

- All installed systems must comply with relevant local and international safety and data protection standards.

- Systems should support interoperability with third-party devices and software through standard protocols such as ONVIF, RESTful APIs, and SDKs.

6. Evaluation Criteria

The tender will be evaluated based on the following criteria:

- Technical capabilities and compliance with the specified requirements.

- System integration experience and proven track record in similar projects.

- Cost-effectiveness and long-term operational efficiency.

- Support and maintenance plans.