Ensuring Secure Remote Work Environments

The computer vision-enabled remote workforce management solution helped overcome scalability challenges while offering transparency and enhanced risk management.

Project Overview

We developed an AI/ML-powered computer vision-enabled monitoring solution that secures remote work environments. The solution uses facial recognition technology for user authentication and raises alarms when business rules are violated, ensuring data security and improved visibility into contact center operations.

Client Profile

US-based technology-enabled global business services company specializing in customer engagement and business performance.

Business Challenge

The crisis brought about by the COVID-19 pandemic resulted in professional services companies requiring their staff to work remotely. With a majority of their workforce working from home, our client faced challenges in ensuring data security and compliance.

The scenario accelerated the need for a secure computer vision-aided off-premises system that would meet the standards expected from an office environment. As data security plays a critical role in contact center operations, there was a need to monitor the presence of unauthorized personnel, mobile devices, books, and blacklisted objects in remote workspaces.

The client required a solution to authenticate, monitor employees, and deliver real-time violation alerts.

Solution

The solution detects, tracks, and verifies human faces in real-time with the help of deep learning neural network architecture to process data models. The anti-spoofing model prevents false facial

verification by using a substitute (photo, video, mask) of an authorized person's face.

Verification checks are performed during login and at regular intervals. The solution also detects objects or devices that are not permitted in the workspace, preventing unauthorized data capture.

Scaling Up

With hundreds and thousands of images, processing takes place on a massive scale. We implemented a comprehensive optimization strategy leveraging computationally efficient architecture to achieve high-performing large-scale face recognition and object detection models. This included batching and threading, GPU memory configurations, scheduling operations between CPU and GPU, leveraging model runtimes – TensorRT, ONNX, and individual scaling of models. Setting up a Docker container-based deployment environment helped to collaborate and scale workloads on a cluster.

Technologies

Business Benefits

- Remote workspace monitoring capabilities offered a high level of visibility into contact center operations and ensured data security
- 98.75% reduction of GPU utilization cost (from $1600 to $20 per frame) for image processing due to advanced optimization using Docker-container architecture

- Improved productivity: Computer vision aided monitoring reduced workspace distractions and resulted in higher productivity after implementation
- High level of transparency, compliance, and risk management for stakeholders
- Increased flexibility and scalability: Ability to operate 24X7 and scale up or down based on demand

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