GigaView: A scalable Platform For Computer Vision and IoT Applications

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GigaCandanga

INTRODUCTION

The GigaView project aims to provide a scalable platform for Computer Vision and IoT services in the scope of the Metropolitan Research and Education Network (MREN) of Brasilia/Brazil, GigaCandanga. Our solution implements all steps from gathering decentralized data, processing and viewing data. It implements state-of-the-art computer vision algorithms which can be used for smart city scenarios, video surveillance applications, satellite image processing (for environment protection), among other relevant applications. The solution's purpose is to optimize sensing, recognition, movement, and identification services by generating alerts, warnings, or triggering actions for devices on an IoT network.

ARCHITECTURE

The solution is based on microservices and queues architecture, which enables scaling and an efficient use of GPUs, which are distributed in a commodity computing-based cluster solution. The producer microservices receive streams of images from cameras in real-time, select frames, and send them to appropriate queues. The consumer microservices process the received frames using GPUs and return results to queues and to a distributed file system. Computer Vision algorithms can be deployed in a modular approach adding specific microservices into the solution. GigaView works with the following technologies:.

PostgreSQL

Registration
- Devices
- Objects

Cassandra

Event Log
- Producer
- Consumer
- Service

MinIO

File System
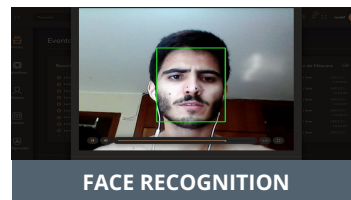- Frames
- Configuration files

Mosquitto

Messenger
- Event queues
- Warnings

APPLICATIONS

CROWDING DETECTION

Detection and recording of the approach of people less than 1.5m away.

FACE-MASK RECOGNITION

Record the proportion between people with and without a mask.

FACE RECOGNITION

Face recognition and identification of registered users for restricted access in environments. Automation of access control in rooms and offices.

ENVIRONMENTAL FIRE DETECTION
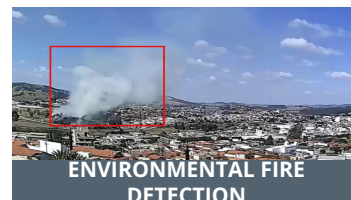
Every year, thousands of forest fires across the globe cause disasters. Products for the recognition of natural or human disasters based on forest fires.

RESULTS

GigaView provides edge Computer Vision & IoT processing services in the MREN that simplifies the implementation of concepts for a digital society.

GIGAVIEW GUI

GIGAVIEW