MassiveAnalytic
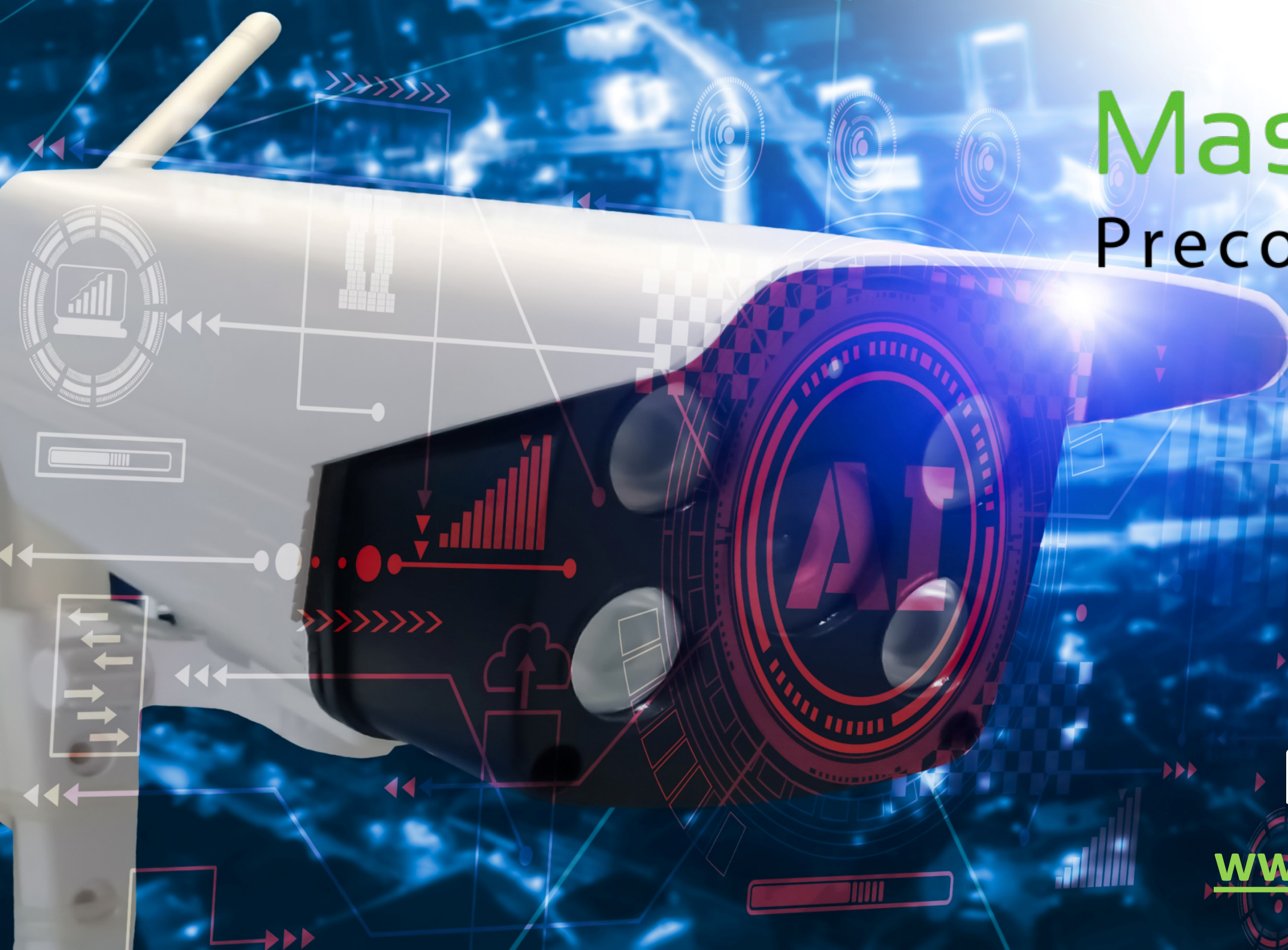## Precognition Machines

Nethra Teaser

www.massiveanalytic.com

Product Capabilities

Outline of functionality / Use Cases

- **Deep learning platform**
- **GDPR compliant**
- **Faster object detection**
- **Digital Twin**
- **Novel solution for head count**
- **Volumetric analysis**
- **Object and vehicle detection**
- **Aggressive behavior**
- **Accidents**
- **Wider functions**

NETHRA
VIDEO ANALYTICS

MassiveAnalytic
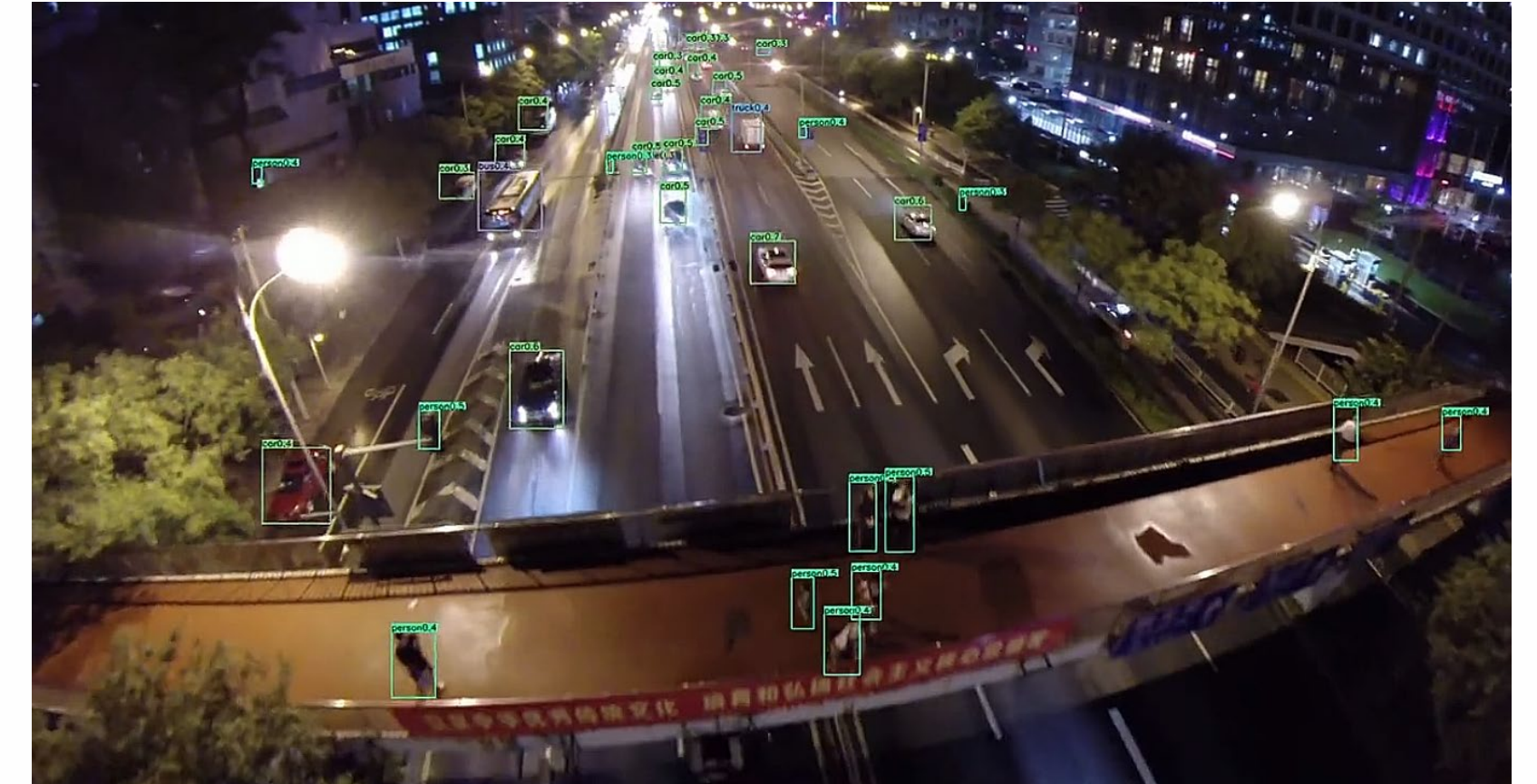Precognition Machines
www.massiveanalytic.com

Deep Learning Platform

Nethra is a **Deep Learning platform** that uses trained neural networks to identify numerous actions and objects from live video. Insights can be streamed from standard quality video footage and Nethra can be run on edge devices or installed locally. Nethra has been trained to identify and alert for a wide variety of different use cases, ranging from **fighting**, to **car crashes** to **left luggage**.

Can be drone or vehicle mounted

GDPR Compliant

Can be combined with VR for GDPR

Nethra is a **fundamentally GDPR compliant** platform. It does not perform facial recognition or store personal identifiers as part of its operations. Past this, it also has another layer of privacy and protection by using virtual reality and digital twinning. This allows Nethra to aid public space management, whilst also obfuscating identity.

NETHRA
VIDEO ANALYTICS

3
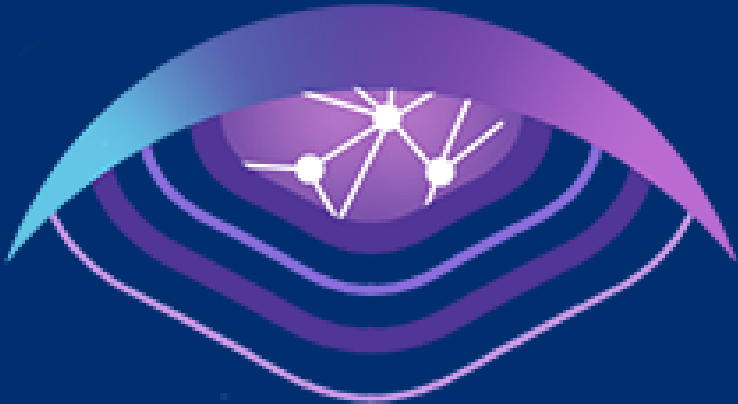
When tested, **Nethra far exceeded the competition in object detection speeds.** This means that Nethra can detect the various objects and behaviours it is trained for extremely quickly, leading to faster alerts and responses.

Object Detection using COCO dataset
512x512 frame size

Network - backbone	FPS (Typical Server GPU - Tesla P100 / 2070 super / 2080 Ti)	
Centernet Hourglass-52	5	
Retinanet Resnet50	10	
Centernet Hourglass-104	14	
SSD-512	32	
Yolov4 Darknet		43
Centernet ResNet-101	45	
Centernet DLA-34		52
EfficientDet-D0		62
Centernet ResNet-18	142	
Yolov4 Darknet (unofficial)	216	
Nethra	**337**	

Nethra is 46% faster on a Server GPU

Network - backbone	FPS (Typical Edge Device GPU - JETSON NX)
Yolov4 Darknet	9
Nethra	**57**

Nethra is 630% faster on an Edge Device GPU

Recent FPS comparison with commonly used frameworks

NETHRA
VIDEO ANALYTICS

Digital Twinning for Increased Productivity

WebGL model of London Bridge Station

Virtual Reality, Digital Twin

By using multiple CCTV feeds, **virtual reality models** of entire spaces can be created. This enables full capture of overall movement, crowd control pain points and more, for the purpose of custom alerts or analysis. Operators can easily view entire areas from a single screen. Combined with custom alerts, this enables Nethra to increase response times, efficiency and productivity in any use case requiring a large volume of cameras.

Optimising Management

Nethra's **digital twin feature** grants a transformative awareness of space for camera operators with a navigable bird's eye view. It can also be **mobile** or **accessed remotely** for real-time monitoring anywhere, meaning that boots on the ground or management are able to quickly react or manage any situation that arises.

Live digital twin showing avatars
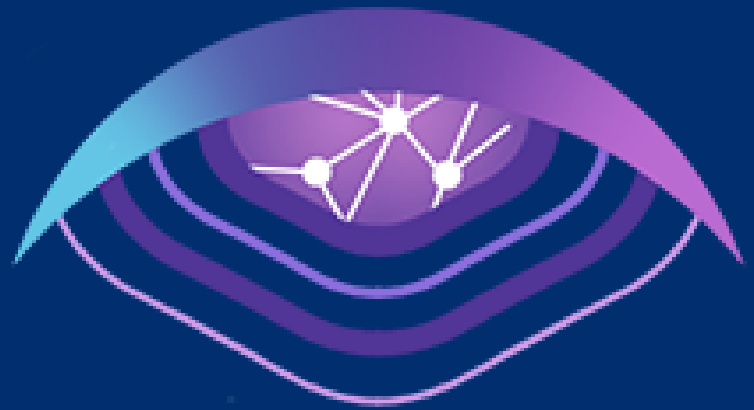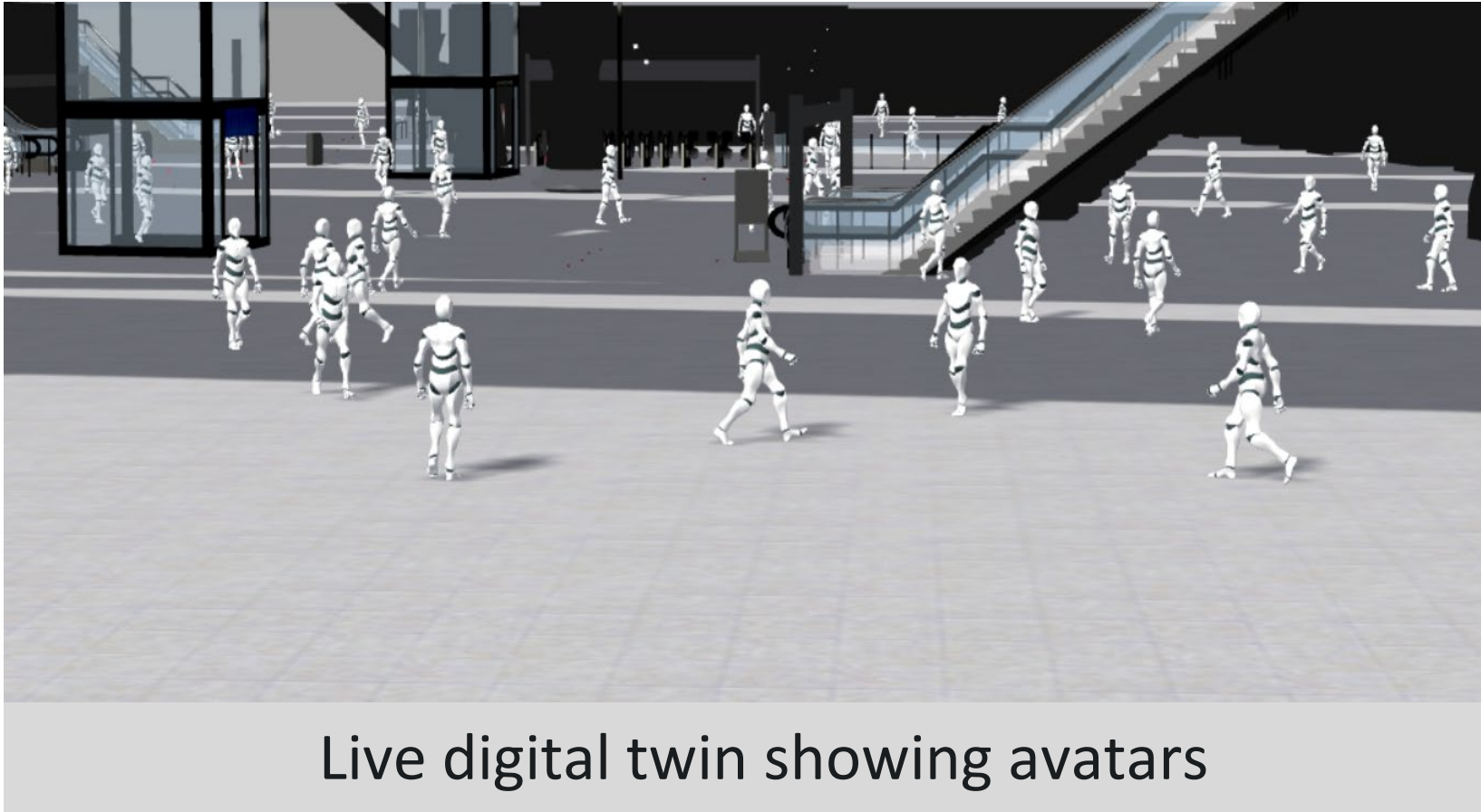
NETHRA
VIDEO ANALYTICS
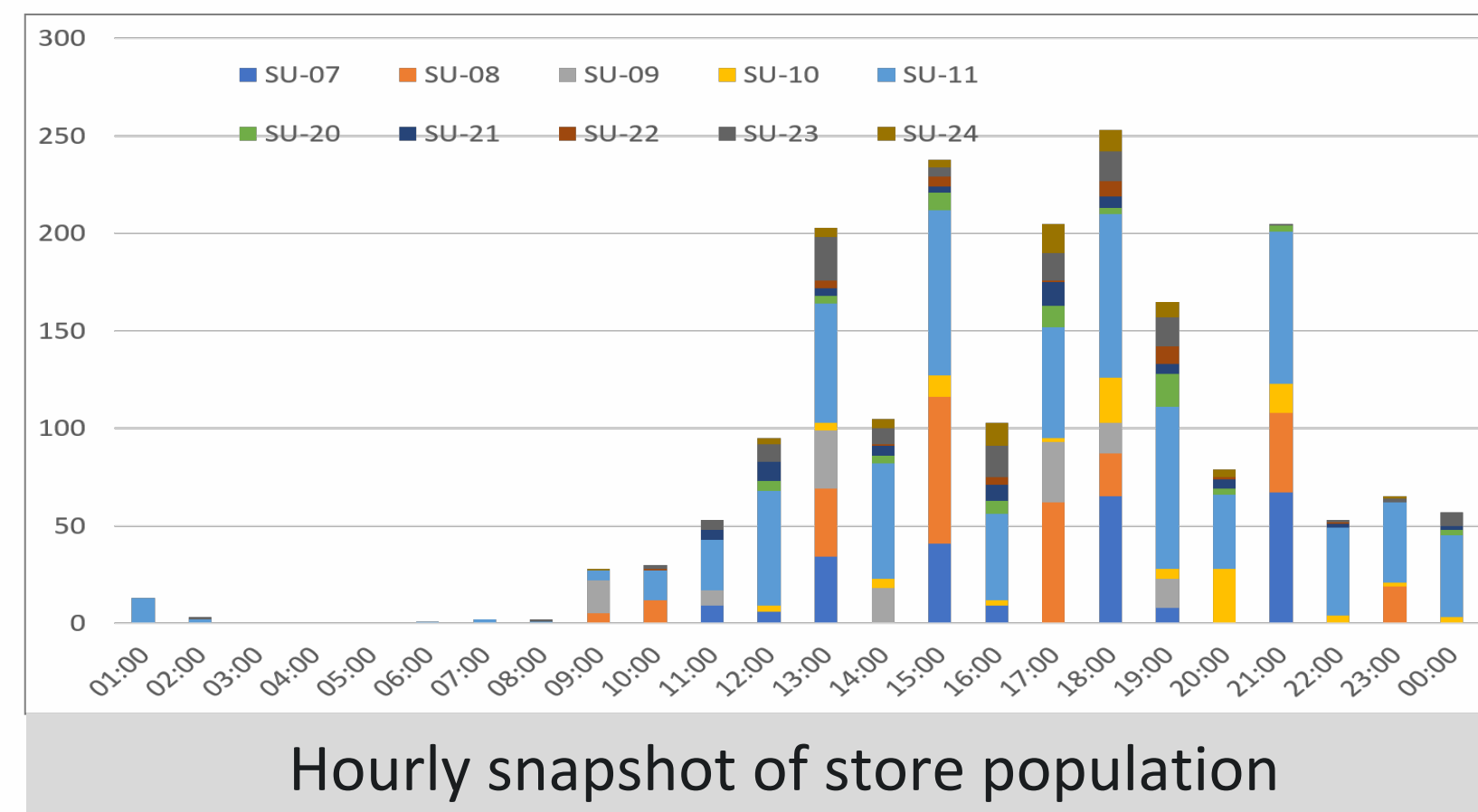
Highly Accurate Individual Counting

Nethra uses a **novel head counting model** to count people between two lines of interest. The head counting model is optimised for top-down CCTV cameras, allowing high levels of accuracy and confidence, even in frames where parts of the body are obscured. The head model is accurate up to >98%, even in packed and crowded scenarios with hourly footfall in the tens of thousands.
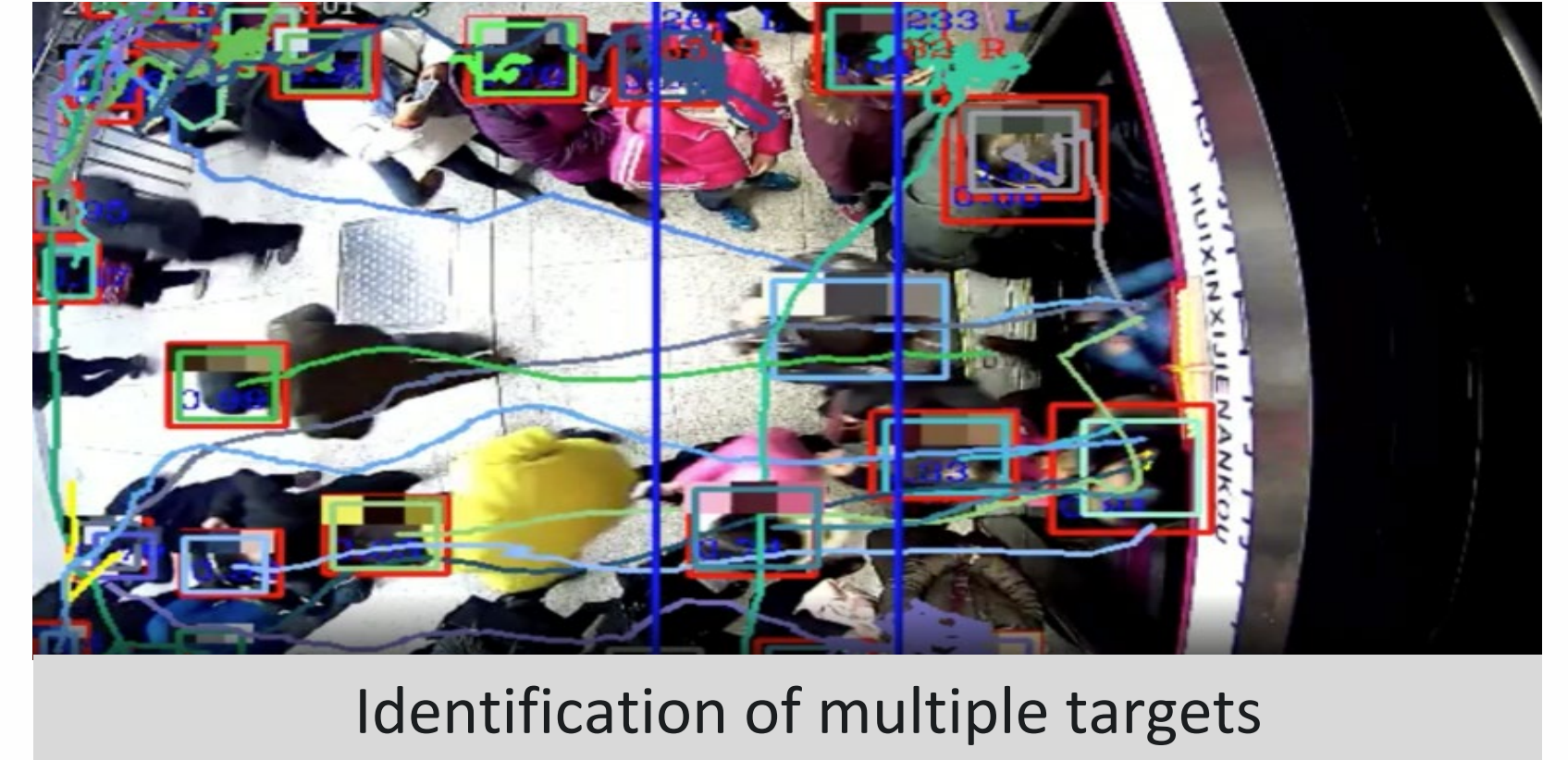
Identification of multiple targets

Volumetric Insights

Hourly snapshot of store population

Using Nethra, operators can set-up lines of interest in parts of the camera frame in order to **capture volumetric insights**. This can be the doorways of shops, the entrance to an arcade or a train gate. The data captured by Nethra can be exported or presented in various ways to provide insights to help drive advertising, retail and more.
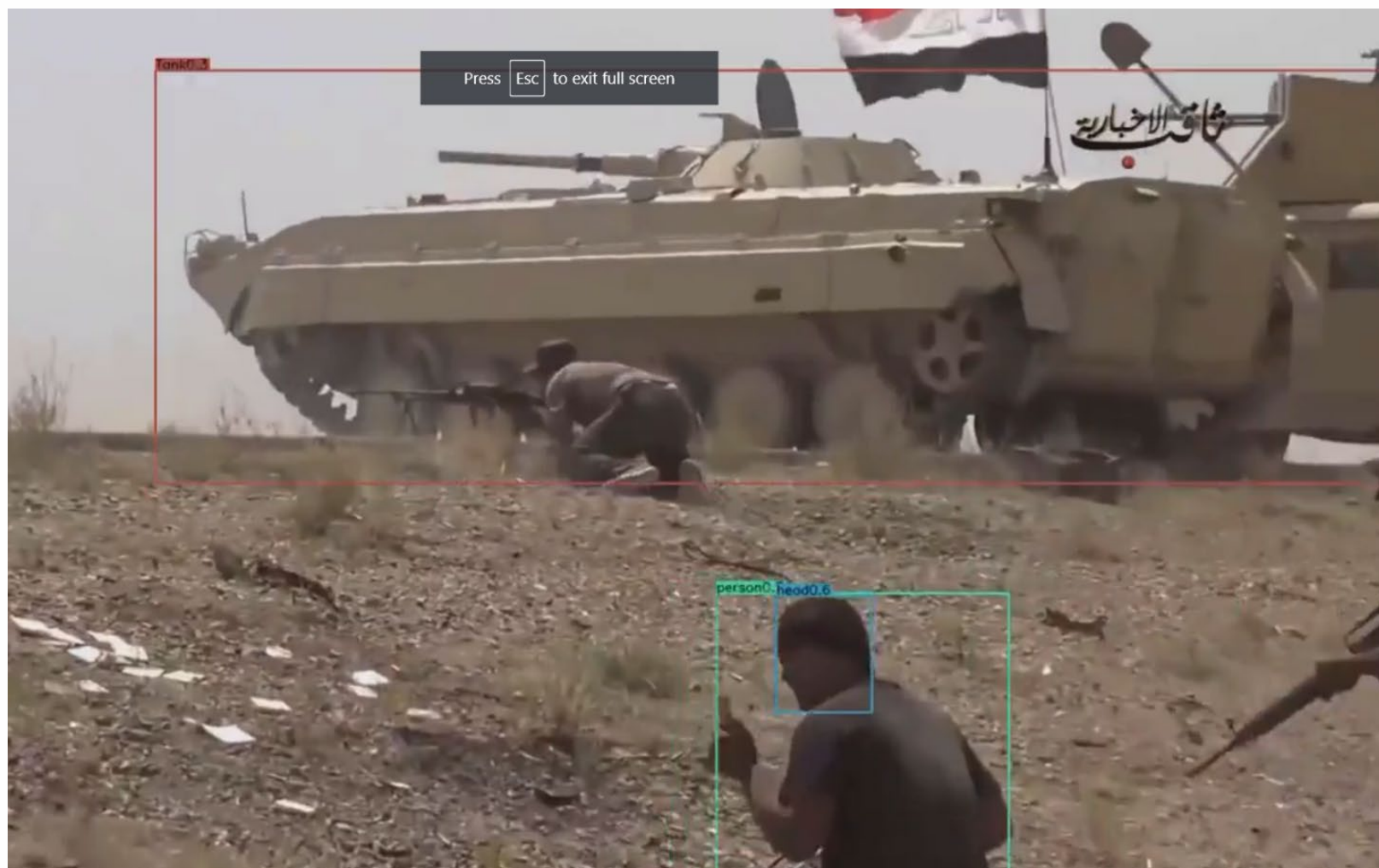
NETHRA
VIDEO ANALYTICS

Vehicle and Weapon Identification

Drone footage of busy road

Vehicle, person and weapons identification

## Identifying Multiple Targets & Object Types

Nethra has been trained to **identify** not just people but also **vehicles** and **weapons in complex and busy environments**. This includes differentiating between cars, trucks and even tanks. It can even be done from high vantage points, such as those from drones. The high FPS object detection of Nethra also means that it can detect vehicles when they are moving at high speeds. Nethra has also been trained to **detect knives, guns** and other **handheld objects**.

NETHRA
VIDEO ANALYTICS

Dangerous Behaviour and Accident Alerts

Fighting & Aggressive Behaviours

Using **human pose recognition, Nethra can detect a range of behaviours,** including fighting and aggressive behaviour. Nethra can detect these instances of violence even from standard or low quality video. Alerts for these behaviours can be programmed in Nethra to alert first responders or authorities.

Fighting alert
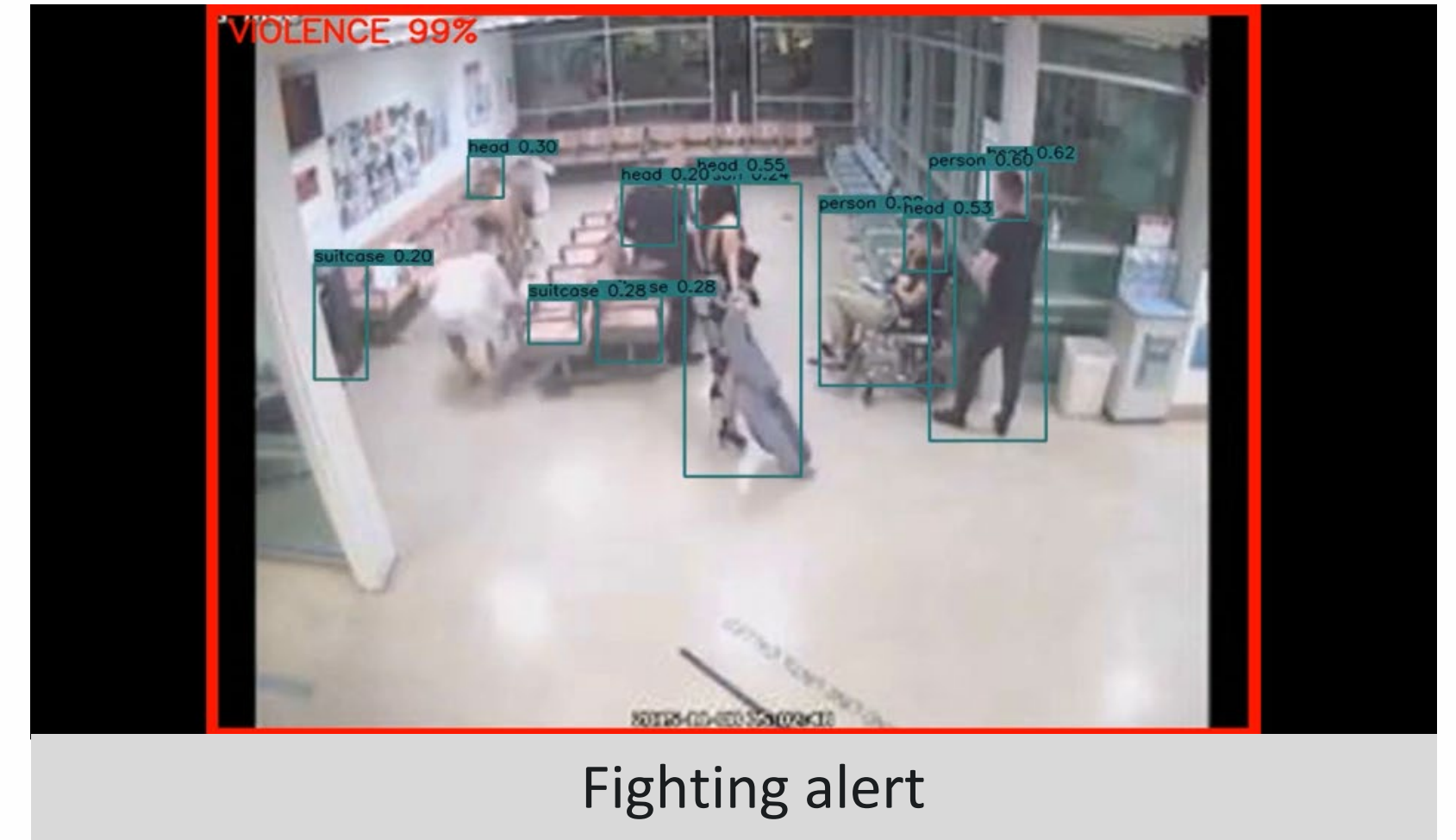
Car Accidents

Car accident alert

Nethra's anomaly detection can **identify car crashes and accidents** from dashboard or traffic light cameras. As with violence or aggressive behaviour, alerts can be customised to instantly alert traffic authorities in the case of a crash.

NETHRA
VIDEO ANALYTICS

Wider Use Cases and Capabilities

Pose estimation can identify a variety of actions

Pose detection enables Nethra to capture a wide variety of different behaviours with a high degree of accuracy. From **dancing to detecting aggressive behaviour and sudden changes in height from falls**, the pose detector has a wide range of applications.

NETHRA
VIDEO ANALYTICS

MassiveAnalytic
Precognition Machines

Massive Analytic Limited | IDEA-London | 69 Wilson Street | London EC2A 2BB | United Kingdom |

+44 (0) 207 100 1140

www.massiveanalytic.com