AI-based Dangerous Object Detection (R&D)

An image processing system that detects blades and weapons in security camera footage and raises the alarm instantly

92% successful detection in laboratory testing

CLIENT	BayPro
INDUSTRY	Security
PROJECT TYPE	R&D
DURATION	1 months (07/2024 – 07/2024)
TECHNOLOGIES	Yolo AI, NVIDIA CUDA, PyTorch, OpenCV, Python

An alarm the moment a dangerous object appears

A custom-trained YOLOv5 model processes security camera footage in real time; when a blade or weapon is shown, a siren sounds and the people in charge get SMS and e-mail alerts.

Highlights

%92	3	3
Successful detection in lab testing	IP cameras at different points	Alarm channels: siren, SMS, e-mail

The problem: the eye on the screen cannot catch everything

At security-sensitive points cameras record all the time, but an operator watching live is looking at many screens at once. When attention drifts or the operator is away from the desk, a critical moment is easily missed; the footage is only reviewed after the event. The aim of this R&D work was to have a machine watch the footage too, as an aid to the human eye: Detect a blade or weapon the moment it appears on camera
Deliver the alarm both on site (siren) and to remote staff (SMS, e-mail)
Work with widely used standard IP cameras

Three steps from camera to alarm

Not a general model, one trained for this job

Laboratory test, July 2024

Where would it help?

Design highlights

What to consider when moving to the field

Although the laboratory result is promising, a real security point brings different conditions. A field deployment also covers: Measuring again under the lighting, angle and distance of the installation site
Tracking false alarms and tuning the alarm threshold to that measurement
Linking the alarm to the existing security procedure and video management system
Processing footage in line with personal data law (KVKK)

Considering image processing for your own site?