

SMART FACTORY SAFETY MONITORING SYSTEM



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SUMMARY

An intelligent, cost-effective safety software that turns existing factory cameras into a 24/7 proactive assistant-delivering real-time alerts and clear evidence while keeping full decision control with supervisors.



SCAN ME

CONTEXT AND BACKGROUND

To resolve manual monitoring challenges at De Heus factories, our team created the Smart Factory Safety Monitoring System. This software solution integrates with existing cameras to continuously monitor danger zones, hazard signs, and uniform compliance and danger behaviors of workers. By instantly delivering alerts and visual evidence to safety supervisors without requiring new hardware, the system transforms standard plant cameras into proactive, 24/7 safety assistants.

THE PROBLEM WE SOLVE

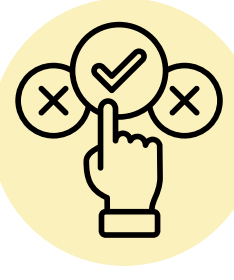
- Coverage Blind Spots:** Supervisors cannot continuously monitor every factory corner, leaving safety violations or worker collapses unnoticed.
- Lack of Instant Alerts:** Traditional cameras without live warnings delay emergency response and complicate incident investigations.
- High Hardware Costs:** Commercial safety platforms demand expensive camera replacements (\$700–\$1,500+ per camera), making multi-site scaling cost-prohibitive.

KEY PROJECT OBJECTIVES



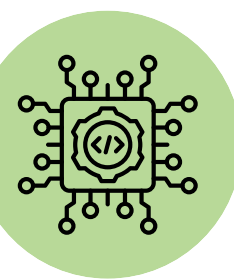
24/7 Proactive Monitoring

Automatically detect uniform compliance, danger zones, and emergencies across all cameras simultaneously.



Human-Governed Decisions

Provide immediate alerts and visual evidence to safety officers, keeping final decision-making in human hands.



Zero-Hardware Upgrade

Deploy as a pure software layer on existing cameras.

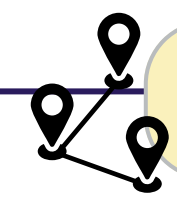


KEY SYSTEM CAPABILITIES & IN-HOUSE TOOLING



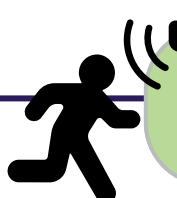
Uniform & Role-Aware Detection

Checks hard hats and vests in real time while distinguishing job roles (e.g., janitors vs workers) to prevent false alarms for authorized people.



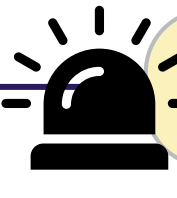
Dynamic Zone & Sign Tracking

Flags unauthorized zone entries and automatically detects temporary caution signs (e.g., "Caution: Wet Floor") for supervisor confirmation.



Emergency & Behavior Detection

Alerts on worker falls and risky actions like running on the plant floor.



Live Feeds, Alerts & Reports

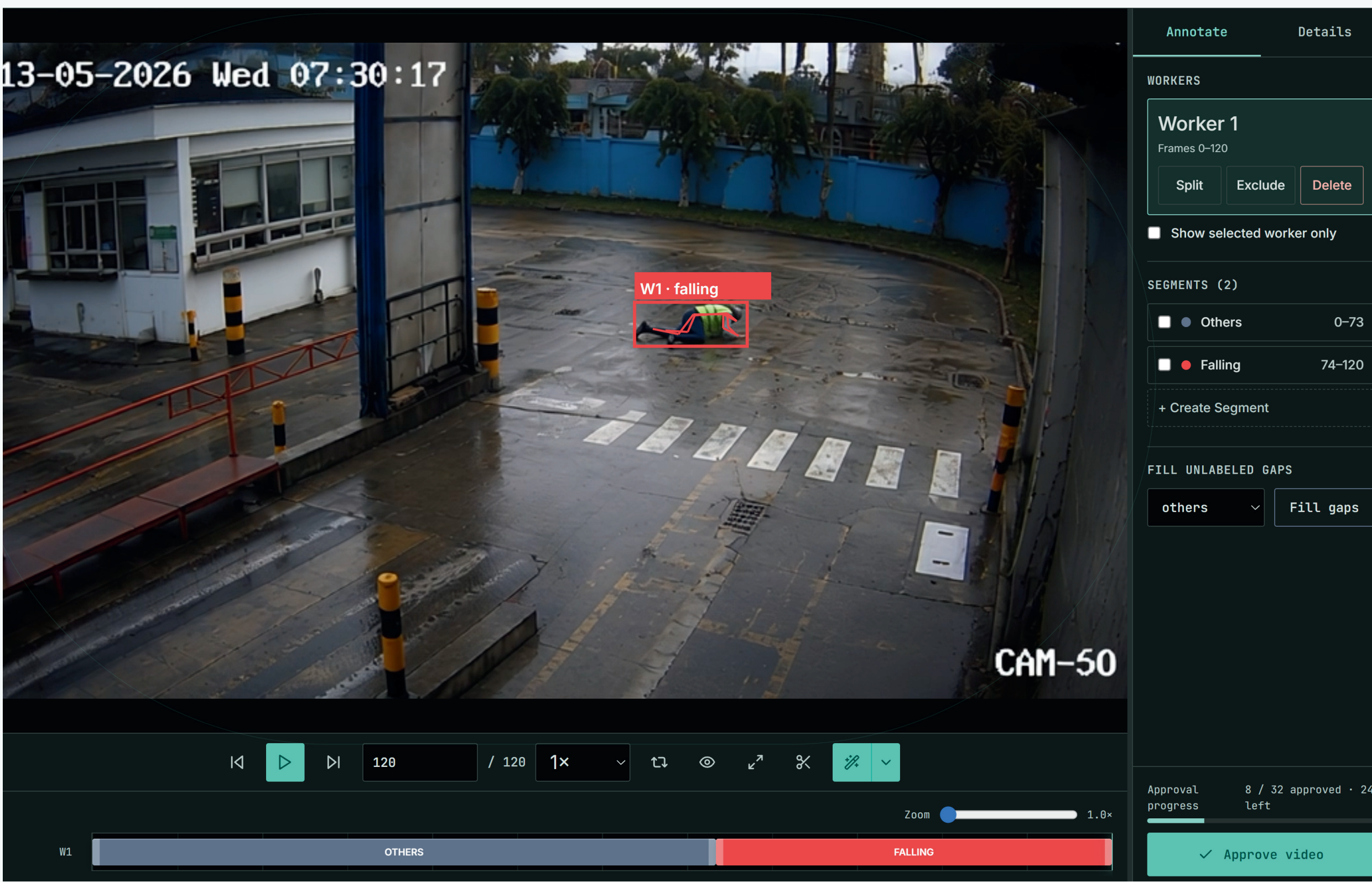
Delivers real-time camera views, instant snapshot alerts, and automated compliance summaries.



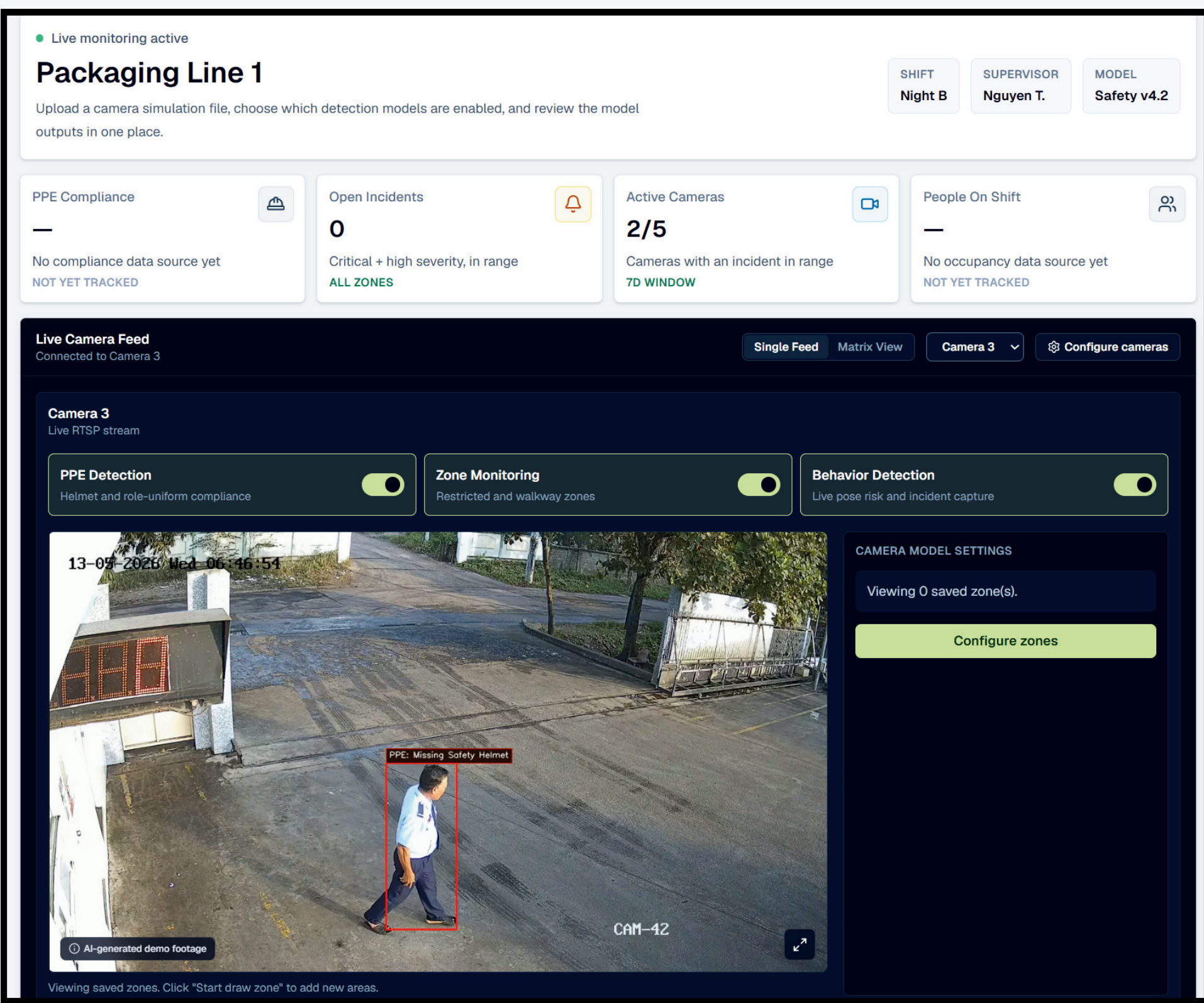
In-House Labeling Tool

A custom data annotation tool labels images and video behaviors to power continuous model training and rapid site adaptation.

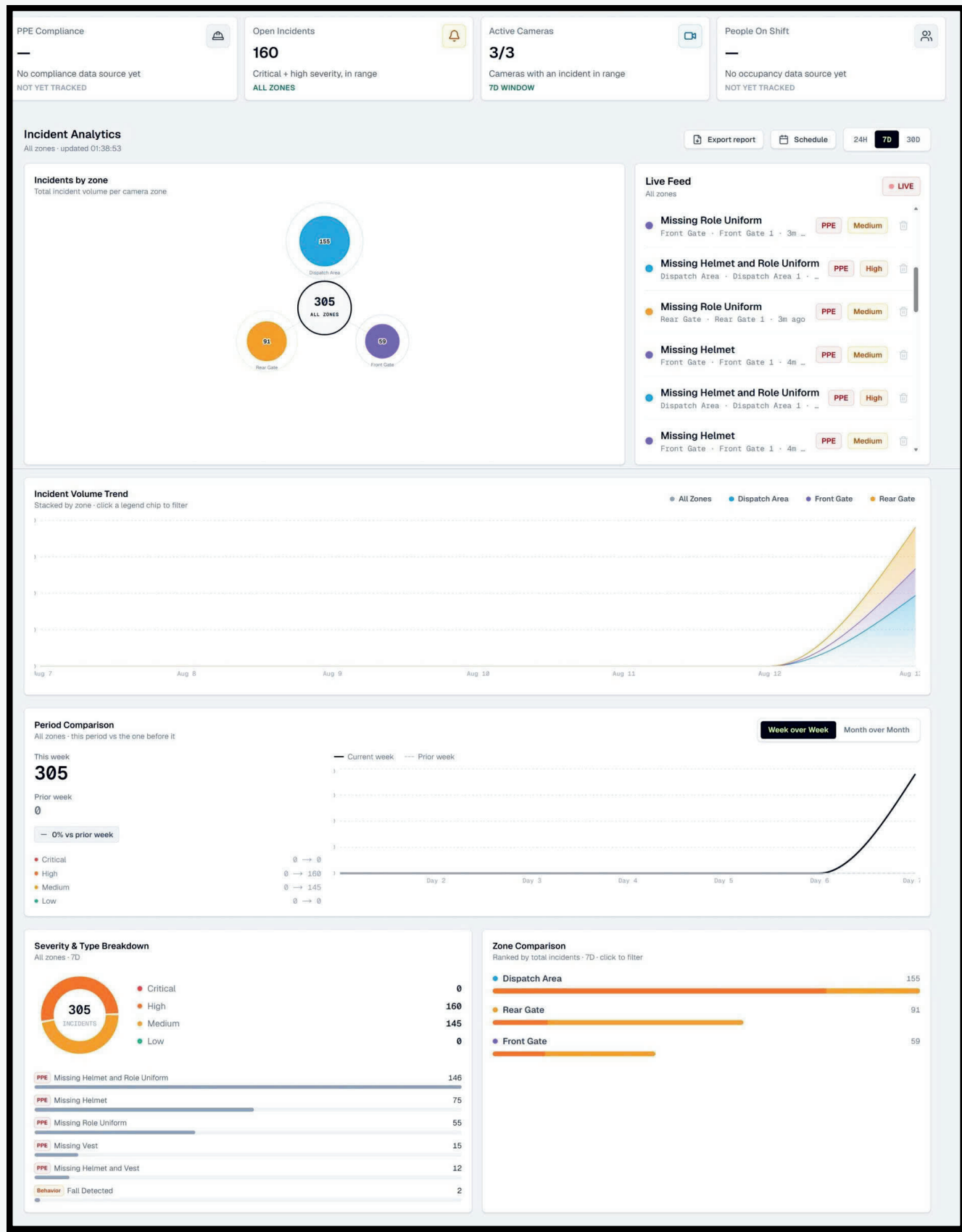
FEATURES



Labeling Tool

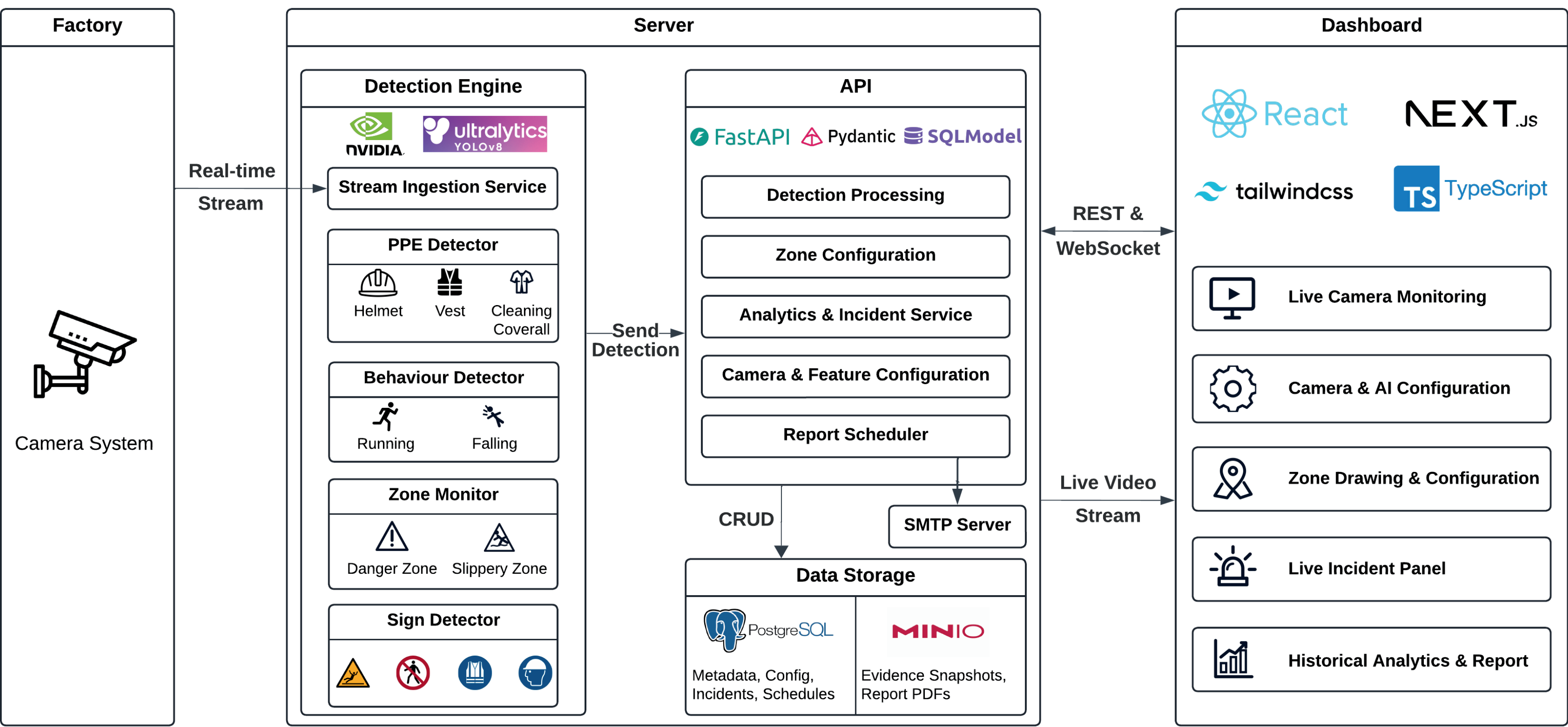


Dashboard Homepage



Incident analytics

SYSTEM ARCHITECTURE



ACKNOWLEDGEMENT

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FUTURE WORKS

The system can be expanded to classify more worker roles and recognize complex workwear across De Heus facilities, such as protective biomedical suits in biosecure zones or specialized gear in machinery repair areas.