DEVELOPMENT & IMPLEMENTATION OF COMPUTER VISION MODELS AND DASHBOARD FOR REAL-TIME ANALYTICS

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1. Executive Summary

We at CODCrafters are pleased to present our proposal to develop and deploy advanced computer vision solutions tailored to your operational needs. This document outlines two collaboration models—Monthly Partnership and One-Time Development Fee—to deliver robust object detection, people counting, and PPE compliance solutions using the YOLO framework.

Our proposed system includes a web-based dashboard for managing projects, analyzing camera data, generating reports, and exporting insights. The backend will operate on Ubuntu servers using modern and scalable open-source technologies.

2. Project Scope

Use Case 1: People Counting

- Detect and count individuals (optional classification: male/female).
- Provide real-time and historical analytics.
- 4 RTSP camera streams.

Use Case 2: PPE Detection

- Detect compliance with required PPE: hairnets, boots, gloves.
- Generate alerts for non-compliance.
- 4 RTSP camera streams.

Each use case will be accessible and manageable via the dashboard with filters, metrics, and export functionality.

Dashboard Features:

- Project and camera management.
- Real-time analytics and metrics.
- Custom reports (exportable in CSV/JSON).
- User roles and access control.

3. Technical Architecture

Layer	Technology
OS & Web Server	Ubuntu 22.04 LTS, Nginx
Backend	Python (FastAPI), OpenCV, YOLOv5/YOLOv8
Frontend	React.js / Next.js
Database	PostgreSQL or MongoDB (based on data structure)
Model Training	PyTorch (YOLO), Roboflow/Label Studio for annotation
Video Input	RTSP/RTMP and file-based (MP4, AVI, etc.)
Deployment	Docker + SSH setup, optional GPU optimization (ONNX, TensorRT)

4. Collaboration Options

Option 1: Monthly Partnership

Overview:

A continuous collaboration where CODCrafters serves as your dedicated computer vision partner, delivering:

- End-to-end development and fine-tuning of YOLO-based models.
- Implementation and maintenance of a real-time, open-source web dashboard.
- Continuous technical support, system upgrades, and optimizations.
- Agile delivery with bi-weekly sprints and feedback sessions.

Estimated Monthly Cost Breakdown:

Resource	Hours/ Week	Hourly Rate (USD)	Monthly Cost (USD)	Responsibility
ML Engineer (1)	25 hrs	$19/hr	$1900	YOLO model training, data preprocessing
Full Stack Developer(1)	20 hrs	$19/hr	$1,520	FastAPI, RTSP stream processing, APIs, React dashboard, UI enhancements
DevOps Engineer + QA	4 hrs	$15/hr	$240	Nginx, Docker, server deployment
			Total:	3660$

Deliverables Included Per Month:

- Up to 1 active YOLO-based models (People Counting)
- Access to Git-based codebase and deployment pipeline
- Real-time RTSP support (4 cameras per use case)
- Basic functional dashboard
- Performance monitoring & bug fixes
- Ongoing model retraining if needed (using new videos or feedback)
- Weekly check-ins or bi-weekly sprint reviews

Flexibility and Scaling:
- Extra work beyond 120 hours/month: Billed at standard hourly rates.
- Can scale team temporarily for larger features or urgent delivery.

Timeline & Milestones:

Phase	Deliverable	Duration	Month
1	Project Setup (Env, RTSP Stream Ingestion)	2 weeks	Month 1
2	People Counting YOLO Model + Integration	4 weeks	Month 1-2
3	Basic Dashboard UI + Live View & Stats	4 weeks	Month 2-3
4	PPE Detection Model + Integration	4 weeks	Month 3
5	Full Dashboard: Reporting, Export, Filtering	3 weeks	Month 3-4
6	Alerts, Notifications, Admin Roles	2 weeks	Month 4
7+	Ongoing support, optimization, retraining	Continuous	Monthly

Note : First MVP available by Week 6-8
        Full System delivered by Week 15–16

Option 2: One-Time Development (Phased Delivery)

Overview:

A fixed-cost model focused on building a modular, reusable system in stages. This approach helps manage budget and allows future upgrades.

Phase 1 – MVP: People Counting + Basic Dashboard

Requirements	Details	Cost (USD)
YOLO Model Training	People detection model (men/women/total), training on provided dataset	$3500
RTSP Stream Integration	Real-time ingestion and decoding of 4 camera feeds	$1500
Backend API (FastAPI)	RESTful endpoints to serve detection data	$1000
Live Dashboard UI (React.js)	Real-time visualization of detection and people count per stream	$1000
Basic Statistics & Storage	Store and display historical count data	$500
Testing & Deployment (Nginx/Docker)	Initial deployment, performance tuning, server hardening	$500
Phase 1: Total		$8000

Phase 2 – PPE Detection + Dashboard Expansion

Item	Details	Cost (USD)
YOLO PPE Model Training	Detect gloves, boots, and hairnets on personnel	$1500
Backend Extension	Process multi-class detection results and feed to UI	$1000
PPE Compliance Metrics	Calculate compliance ratios per stream/person	$700
Camera-Based Filtering	UI filters to select data by camera	$800
Report Generation (CSV Export)	Export detection and compliance reports	$1000
Phase 2: Total		$5000

Phase 3 – Analytics, Alerts & Admin Panel (Optional)

Requirements	Details	Cost (USD)
Historical Analytics	Charting detection & compliance trends over time (daily/weekly/monthly)	$800
Real-Time Alerts	Notifications for PPE non-compliance or anomalies (email/SMS/onscreen)	$700
User Authentication	Login system with user session handling	$500
Role-Based Access Control	Admin, supervisor, viewer roles with different access levels	$500
QA, Documentation & Final Testing	Final round of testing and technical documentation	$500
Phase 3: Total		$3000

Total Project Cost (Option 2)

Phase	Cost (USD)
Phase 1	$8,000
Phase 2	$5,000
Phase 3	$3,000
Total: $16000	

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5. YOLO Model Training Services

We offer separate services for dataset handling and model training.

Hourly Rate: $35 USD
Minimum block: 40 hours

Task	Est. Hours
Data Cleaning & Formatting	10–18 hrs
Labeling Supervision (if needed)	10–15 hrs
Model Training + Testing	20–25 hrs per model
Deployment Integration	10–12 hrs

Input Formats:
- YOLO TXT, COCO JSON, or CVAT/Roboflow exports

Supported Tools:
- Label Studio, CVAT, Roboflow

6. Team Structure

Role	Responsibilities
Project Manager (1)	Delivery planning, client communication
Machine Learning Engineers (2)	Dataset handling, model training, evaluation
Backend Developer (1)	FastAPI development, stream processing
Frontend Developer (1)	Dashboard UI/UX in React.js
DevOps Engineer (1)	Server setup, Nginx, Docker, deployment
QA Engineer (1)	Functional & performance testing

Input Formats:
- YOLO TXT, COCO JSON, or CVAT/Roboflow exports

Supported Tools:
- Label Studio, CVAT, Roboflow

7. Confidentiality & Data Protection

We prioritize your data's privacy and system integrity. Key commitments:

- NDA: Signed upon confirmation.
- RTSP Security: Secured access over VPN/SSH.
- No Third-party Data Usage without written consent.
- Storage & Logs: Encrypted and access-controlled.
- Compliance: GDPR-like standards for data handling.

Conclusion

Both collaboration models are designed to fit your requirements, offering you:

- A future-proof architecture built on open-source technologies.
- State-of-the-art YOLO model integrations.
- A professional, dedicated team with proven experience in CV/AI.
- Scalable system design for future add-ons (e.g., tracking, anomaly detection).

We would be happy to discuss the best fit for your team's needs in a follow-up call. Please let us know your preferred model and timeline for initiation.

For Inquiries, Contact Us

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