
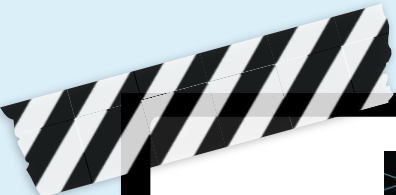


Edge IOT Device for Counting People in a Region of Interest

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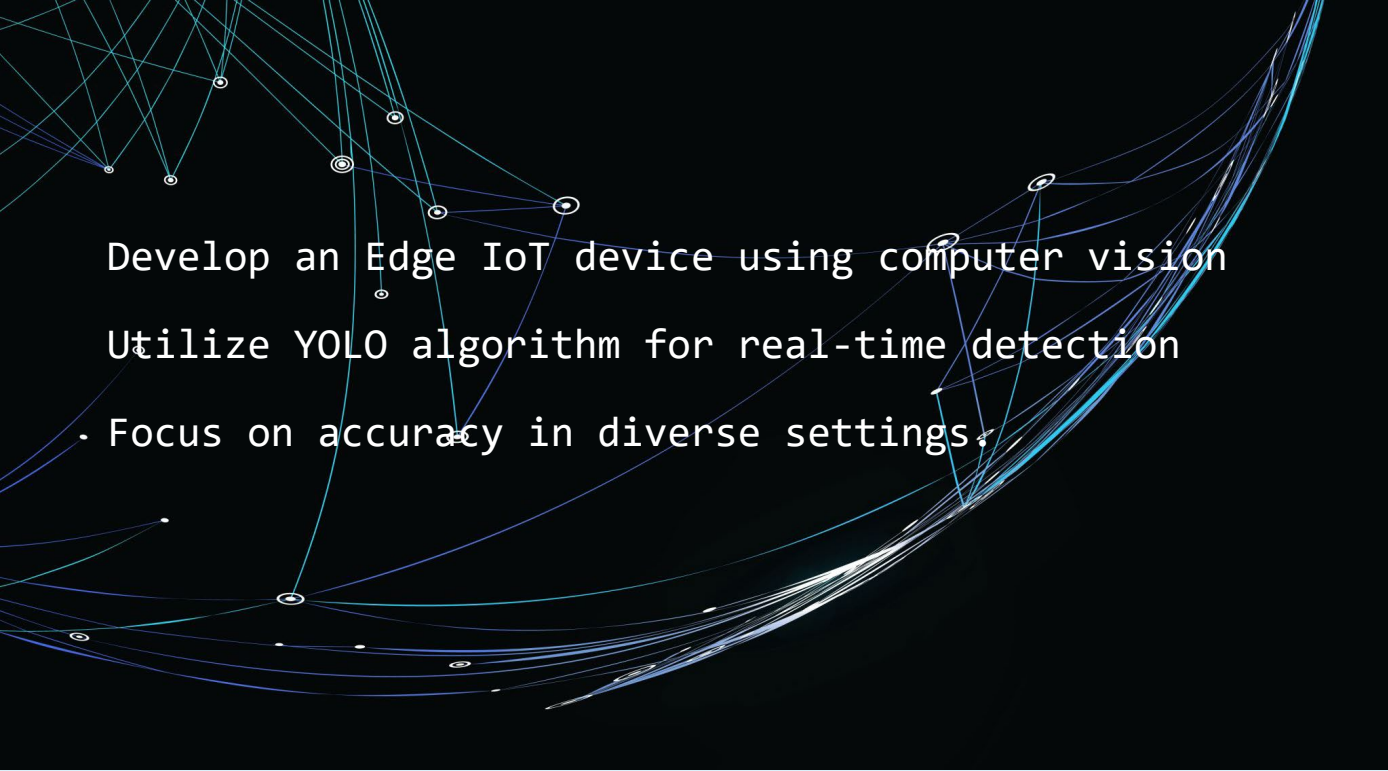




Need for accurate people counting in various environments
Crucial for safety and efficiency
Demand for adaptable, precise solutions

Situation





Develop an Edge IoT device using computer vision
Utilize YOLO algorithm for real-time detection
• Focus on accuracy in diverse settings.

Task





Analyzed MP4 footage of public spaces

Standardized video format and resolution

Implemented data augmentation for robustness

Set hidden layers structure

Set Region Of Interest (ROI)

Export Data Batch file

Action – Data

Preprocessing





Chose YOLOv8 for its robustness

Trained and validated model on pre-processed model

Test on test MP4 surveillance file

Create Export file for external monitoring systems

Used precision, recall, F1 score for performance metrics

Action -

Modeling





Addressed challenges in diverse environments

Overcame issues in poor lighting and high crowd density

Enhanced model adaptability and accuracy

Action - Challenges





High accuracy in people detection

Improved performance in challenging conditions

Demonstrated model's potential in real-time applications

Produced a Tableau monitoring information system

Result - Primary

Findings





Fine-tuned model outperformed base model

Dynamic adjustment of ROI

Showcased better adaptability in various scenarios

Validation with unseen data confirmed generalizability

Result - Model

Comparison





Project highlights importance of computer vision in crowd management
Opens avenues for further innovation in occupancy monitoring

Conclusion



Team Contributions

Adam

- In-code documentation, and readability
- Technical coding
- Model training, iteration, and testing

Reed

- In-code documentation, and readability
- Technical coding
- Model training, iteration, and testing

Christi

- Code validation
- Final technical report
- Built final presentation

