10-Weeks Internship Report

Duc Tran

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ISODS

Agenda

1. Week 1 - 10 Highlights
2. Key Achievements
3. Challenges and Learnings
4. Contributions to the Team
5. Alert Functionality
6. Segmentation Algorithm
7. Conclusion and Reflection

Week 1 (8th July ~ 15th July)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Conducted market research	Narrow down idea and calculate costs and time.	Gathered market insights to prepare for creating a mobile application

Week 2 (15th July ~ 22nd July)

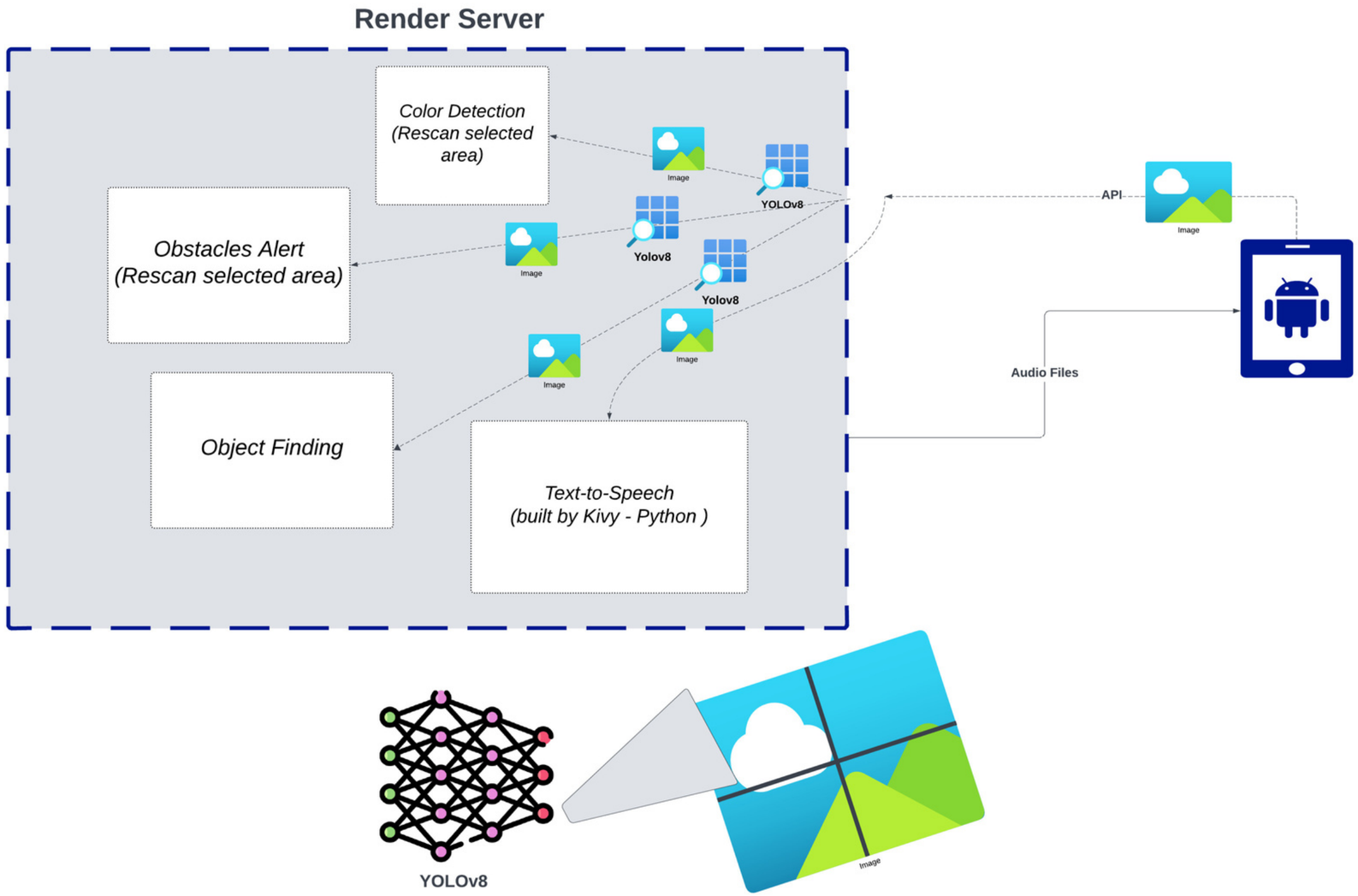
WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Conducted research and identified the need with Text-to-Speech (TTS)	Navigating wide range of V.I.P and determining essential features	• Materials under $200 • Repurpose an old dash cam • Raspberry Pi 4

Items	Price	Note
Raspberry Pi (e.g., Raspberry Pi 3 or newer)	$55	
Camera module compatible with Raspberry Pi (e.g., Raspberry Pi Camera Module)	$100	Already had
USB microphone (optional, for voice commands)	$3	the eSpeak TTS engine, and the pyttsx3 library
Speaker or headphones for audio output	$9	Speaker already had
SD card with Raspbian (or Raspberry Pi OS) installed	$4	
Internet connection (for installing packages and accessing TTS services)	$3	ESP8266 Wi-Fi module (May have this feature)
Screwdrivers and other basic tools for disassembly	$3	
Soldering iron and solder		
Multimeter (to check connections and voltages)		
Power source (e.g., batteries, USB power bank)		
Total	$177	

Week 3 (22nd July ~ 29th July)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Drew an architecture diagram	Ensuring compatibility and functionality for mobile devices.	• Architecture diagram • APIs (WaveNet, pytesseract)

Architecture



Week 4 (29th July ~ 5th August)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
TTS feature (Tacotron2 and WaveNet algorithms)	Version compatibility issues	Explore Tacotron2 and WaveNet models

Week 5 (5th August ~ 12th August)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Generate speech from text with Tacotron2	Preprocessing PDF text	Testing the TTS functionality

Week 6 (12th August ~ 19th August)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
• Collaborate divided tasks into sub-groups • Develope server functions.	Distribution of tasks among team members.	Distribute server, color detection, TTS, and alert functionality to each member

Week 7 (19th August ~ 26th August)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Tested YOLOv8 for object detection	Configuring models and achieving optimal performance	• Adopt YOLOv8 • Server integration

Week 8 (26th August ~ 2nd September)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
• Streamline model version • Refining alert functionality	Balancing accuracy and efficiency in object detection and alerting	• Mobile integration • Execute the alert function

Week 9 (2nd September ~ 9th September)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Distance measurement, received raw and depth images	Fine-tuning the alert function	• Implement distance-based alerting • Test APIs images

Week 10 (9th September ~ 16th September)

WORKED ON	CHALLENGES	KEY ACCOMPLISHMENTS
Segmentation algorithm (yolov8n-seg.pt)	Debugging and fine-tuning	• Deploy segmentation algorithm • Enhance detection accuracy

Sum Up

Key Achievements

- Conducted market research
- Integrated pre-trained models
- Deployed server to execute functions
- Worked as a team

Challenges and Learnings

- Navigated a wide range of visual impairment products.
- Addressed version compatibility issues.
- Demonstrated adaptability and problem-solving skills.

Contributions to the Team

- Collaborated with team members on project aspects.
- Contributed to the overall team's progress.

Alert Functionality

- Implemented the alert functionality.
- Determined the triggering distance.
- Efforts to enhance the accuracy of the alert system.

Segmentation Algorithm

- Deployed the segmentation algorithm in YOLOv8.
- Mentioned debugging efforts.
- Plans for further investigation.

Conclusion & Reflection

Thank You