From Students…
…to Professionals

Project Plan Presentation
Car Dealership Auditing Assistant

The Capstone Experience

Team Urban Science

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Project Sponsor Overview

• Urban Science develops software and processes for automotive OEMs to evaluate performance across key business operations
• Serves clients from over 70 countries
• Headquartered in Detroit, MI
Project Functional Specifications

- Determines if a dealership is compliant with given brand standards
- Solves a laborious task that assigns field representatives by utilizing AI to analyze video footage from dealerships
- Will be used by the Urban Science audit team through a web application
Project Design Specifications

• Header -> Home, Audit, Login
• Navigation Bar -> Dashboard, Upload, Results
• Other -> Contact, Settings
Screen Mockup: Dashboard
Screen Mockup: Media Upload
Screen Mockup: Results

Results:
11/32 Tests Successful

34%
Screen Mockup: Annotated Image
Project Technical Specifications

• Web application front end built using React and Material UI
• Back end is implemented in Python using the Flask framework
• Computer vision tasks achieved using the YOLO model and the Vision API
• Integrated with Python back end using OpenCV and Pillow libraries
Project System Architecture
Project System Components

• Software Platforms / Technologies
  ▪ Flask
    ○ OpenCV, YOLO, Pillow
  ▪ Firebase
    ○ Firestore, Auth, Cloud Storage
  ▪ React
    ○ React Router, FilePond, Material UI, Axios
  ▪ API
    ○ Cloud Vision API
Project Risks

• Computing spatial information
  ▪ Research similar projects and use a pre-measured object (a cardboard cutout) in the footage to help with depth perception.

• Long video processing times
  ▪ Explore ways to synthesize the algorithms, minimize the number of models and tools utilized, and reduce the number of processing cycles.

• Evaluation of cleanliness
  ▪ Learn how to build and train a custom ML model from scratch. Find research / projects that we can leverage in implementing this feature.

• Access limited to a single dealership
  ▪ Training and testing on a single dealership may lead to subpar back end models
  ▪ Use Open Web media to emulate real dealership footage with different building layouts and shapes, lighting, brands, etc.
Questions?