MICHIGAN STATE UNIVERSITY

Project Plan

Learning New Train Routes

The Capstone Experience

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From Students…

…to Professionals

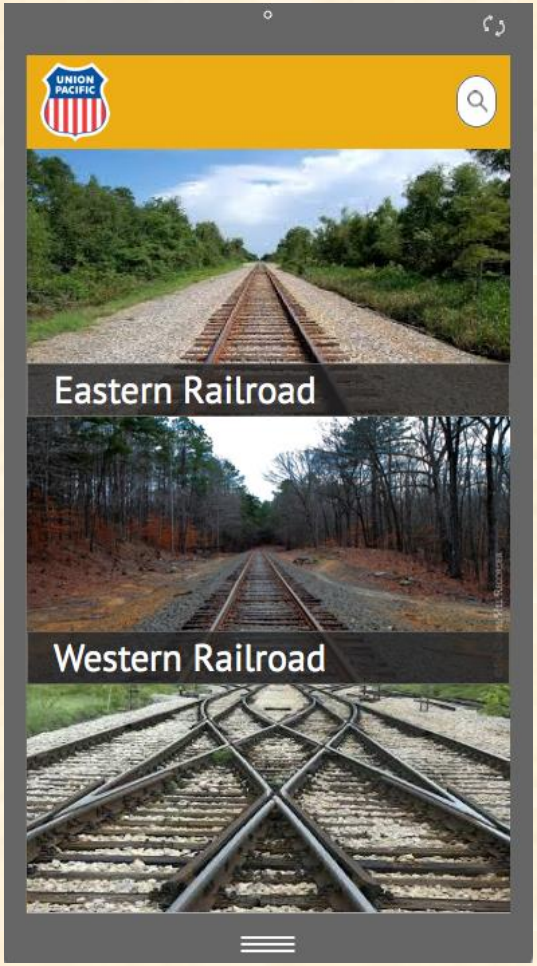
Functional Specifications

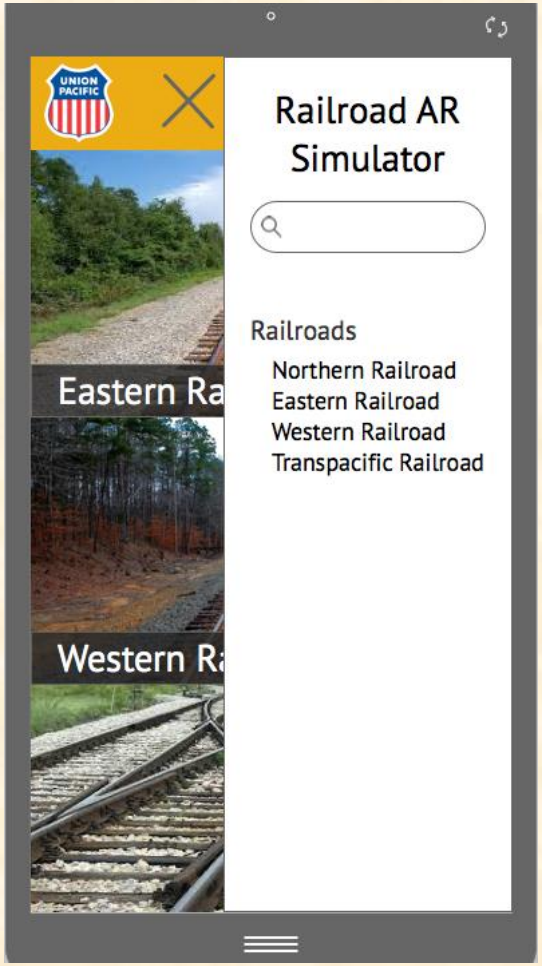
- Solution to provide engineers railroad comprehensive information and save money.
- Information including speed, direction and recognized railroad signals etc.
- Simple + straight forward UI designed for engineers to view and anytime.
- Stretch goals including allow comment sharing about railroad between users. Recognize railroad inconsistency etc..

Design Specifications

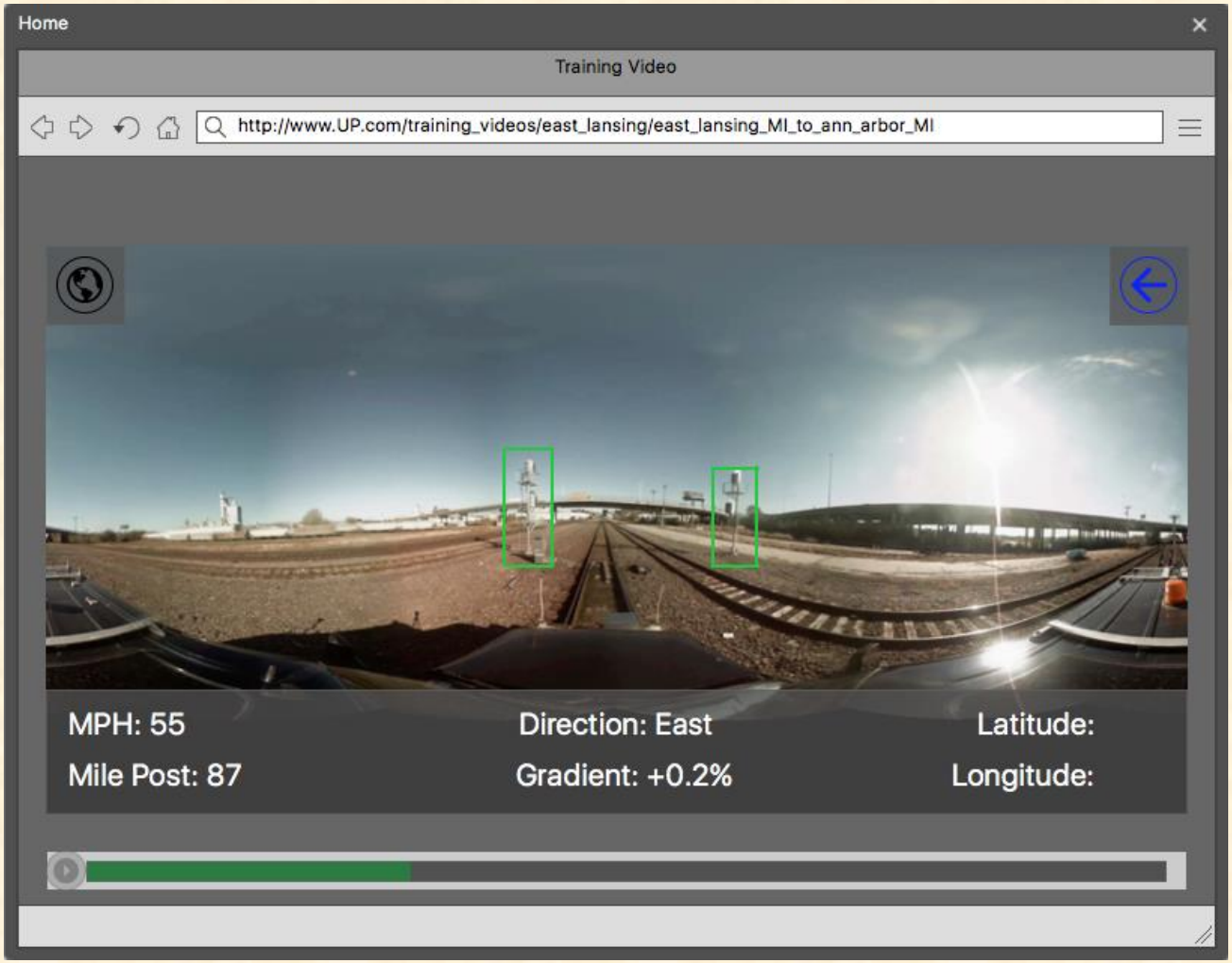
- Website
  - Website Control
- AR Video
  - The Training Simulation
- Map View
  - Assisted View Of The Map

Screen Mockup: Website

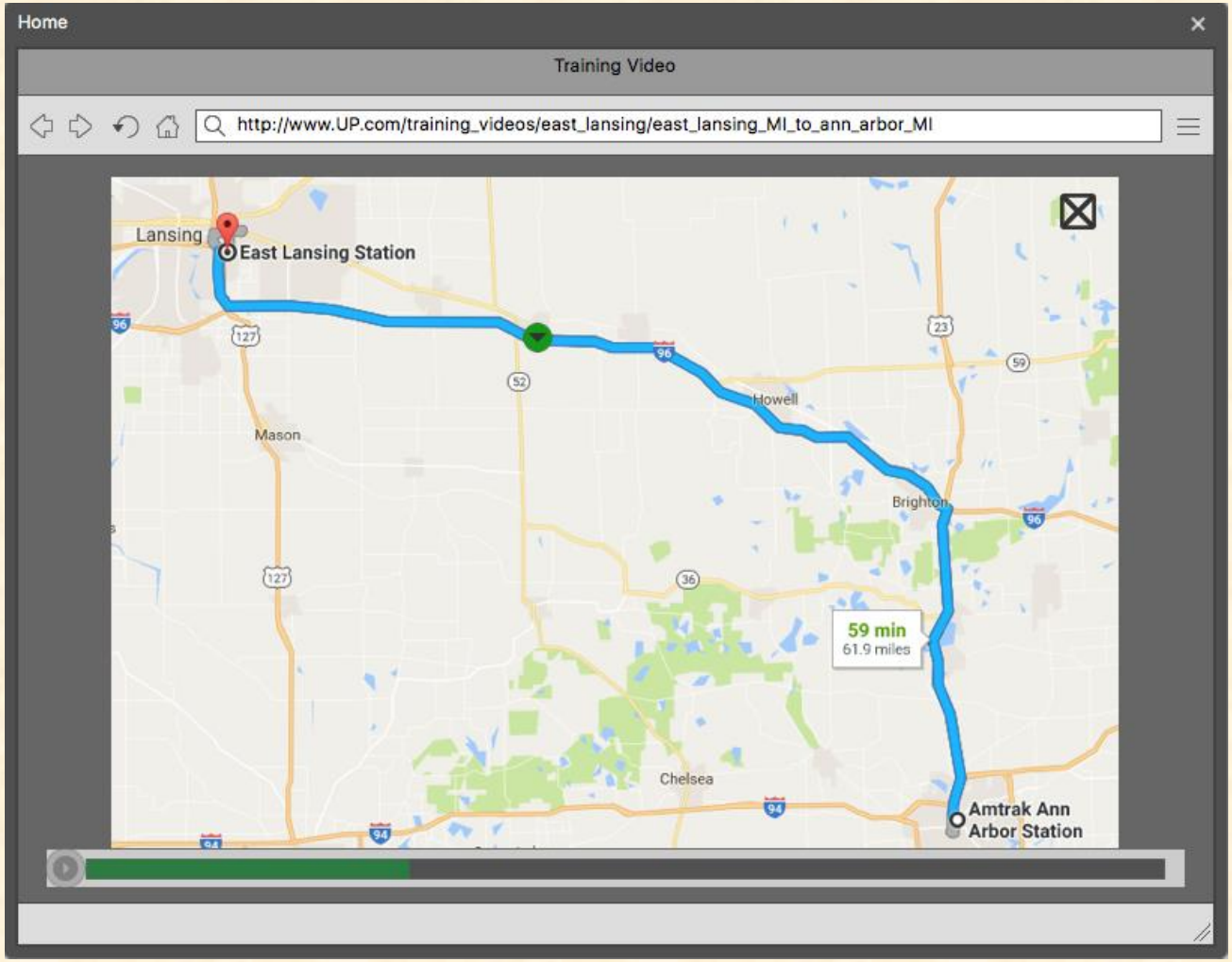




Screen Mockup: AR Overlay



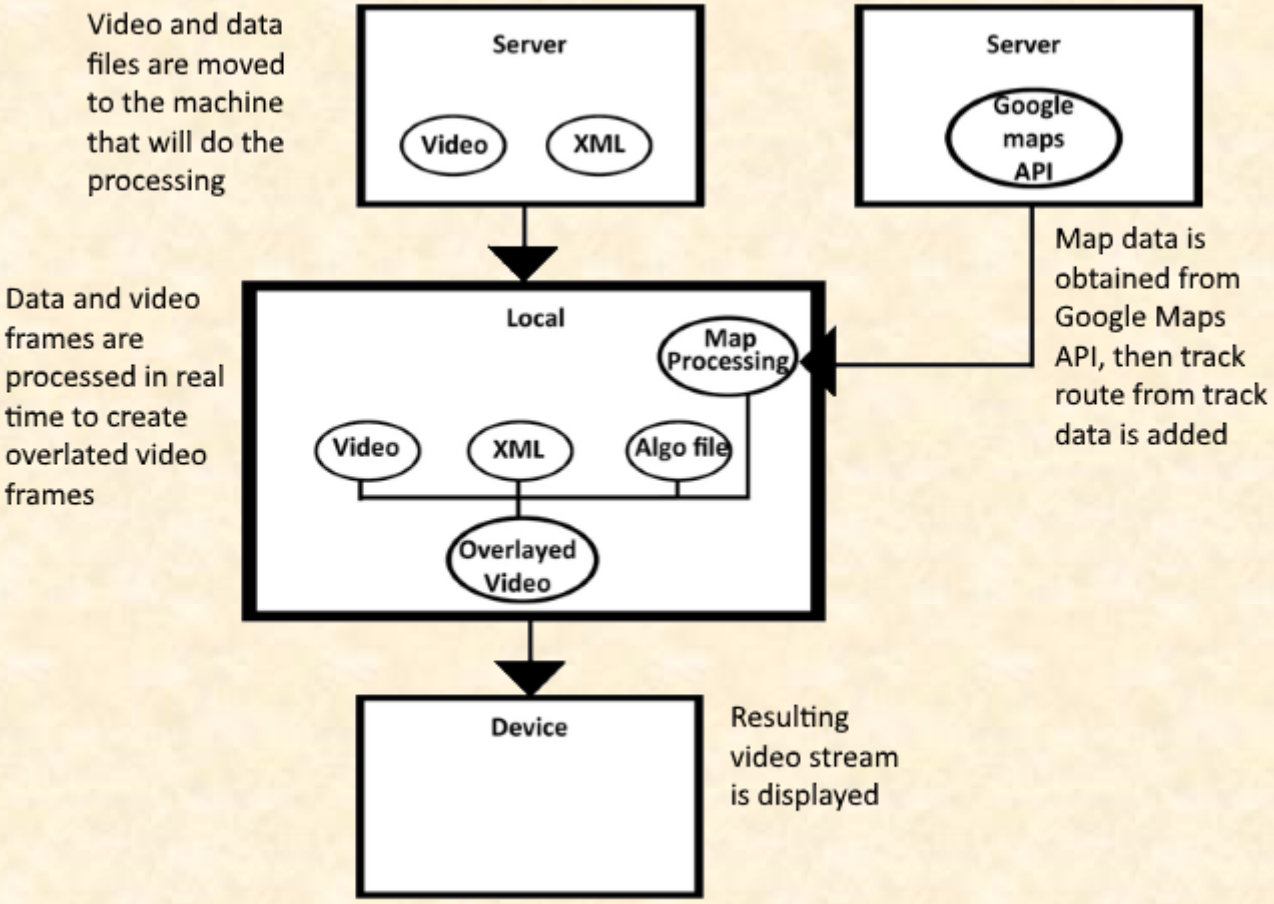
Screen Mockup: Map View



Technical Specifications

- Image Recognition Engine - Utilizes HAAR-Classifier with OpenCV
- Overlay Display Module - Creates video overlay from track data in XML and CSV files
- Minimap Module - Uses Google Maps API and location data from track data files
- Stretch goal - Web application allowing streaming to any device - Uses Django/Flask Python frameworks, 360 degree video

System Architecture



System Components

- Hardware Platforms
- All smart devices in different sizes
- Phones, laptops and tablets
- Etc…
- Software Platforms / Technologies
- Recognition and overlay module generated with OpenCV
- Customized video player.
- HTML front end

Testing

- Manual use of Webcam/Pictures For Image Recognition
- Tests Overlay Feature with Different Videos And Data
- Testing Different Feature Working On Browsers
- Deliver To Client For Usage Testing

Risks

- Risk 1
  - Image Recognition
  - OpenCV, Tutorials, Professors
- Risk 2
  - Performance/Optimization
  - Serve Post Process, Minimize
- Risk 3
  - Map Module
  - Google Maps API, Tutorials, Demos
- Risk 4
  - Django/Flask Frameworks
  - Tutorials, Demos, Prototypes

Questions?