Mobile Navigation Control for Planetary Web Portals

-- Trek Controller --
The Team

- Miguel Martinez - Team Lead
- John Calilung - Web Architecture Lead
- Frank Navarrete - iOS Architecture Lead
- Kevin Parton - Documentation Lead
- Max Ru - UI & QA Lead
- Catherine Suh - Customer Liaison Lead

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- Elaine Kang
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- Emily Law
- George Chang
- Shan Malhotra
Agenda

1  Overview
2  Demo
3  Technical Implementation
4  Additional Features
5  Questions?
Overview
The Project

Develop a mobile controller which allows users to navigate any Trek Portal without the use of a mouse or keyboard.
Concept
Features

Platforms
- iOS
- Web
Features

Controller Modes
- Touch-Swipe
- Joystick
- Motion (iOS)
Features

Controller Functions

- 2D | 3D
- 8-way movement
- Zoom in, out
- Reset View
Features

Connection Management
- QR- & Verification-code
- Queue

Extras
- Mars Fast Facts
- Weight on Mars
- About Trek Controller
- Social Media
Demo
Technical Implementation
Application Flow

1. Send Commands
2. Push Commands
3. Request specific images
4. Send specific images

Browser and Server - the Trek Portals
Trek Controller - Joystick Mode
Trek Controller - Touch-Swipe Mode
Content Delivery Network - holds images
Server - hosts the Trek Controller app and the Queue system
Server

Servlet
- Concurrent Controllers & Trek Instances
- SSE
  - Routing
    - Session Object
    - Concurrent Map with Key

Server Sent Event (SSE)
- Unidirectional Events
  - No need for bidirectional communication
- Faster to implement
Touch-Swipe
- Web & iOS
  - Swipes
  - Pinches
- API

Joystick
- Web
  - nippleJS
- iOS
  - SpriteKit
  - API

Motion
- iOS
- No zoom motion
- API
Front End — Trek

2D View
- ArcGIS Map

3D View
- Game Controller
- On-Tick Listener
Front End — Trek

QR

- Overlay
- 4-digit code
- White border
- Amount of info
Queue

Back-End
- MySQL
- Cookies
  - Controller ID
  - Trek ID

Front-End
- SSE
- Position Updates
- Redirect to Controller

Welcome to the Launchpad!

There are currently 0 people ahead of you. You're up! You will be redirected to the controller.

ETA: 0 minute(s) left.
Development Timeline

**Alpha** Dec 16, 2016
- 3D
- Touch-Swipe
- Joystick

**Beta** April 7, 2017
- 2D
- Motion (iOS)
- Routing
- Design

**Final** May 5, 2017
- Queue
- Bug-free
Additional Features

- Motion (Web)
- Rotate
- Help
- Screenshots
- Bookmarks
- Presenter Mode
- JPL News
Technology & Challenges

Standalone Site
- Javascript
- Dojo

SSE
- Servlets
- Disconnects

Design Flow
- Refining implementation details

iOS
- Swift
- Compatibility

Web
- Javascript
- Compatibility

Bugs
- QA
Conclusion

- Communication architecture
- User-friendly front-end
- 8-way movement and zoom
- Queueing system
QUESTIONS?