## The Computer Science Senior Capstone Experience

#### CSE498 Collaborative Design

Department of Computer Science and Engineering
Michigan State University
Fall 2009

Professor Wayne Dyksen

## Course Objectives

- Complete a Large Software Project
  - Architect
  - Implement
  - Test
  - Document
  - Deliver
- For a Client
- From "Scratch"
- In 15 (Short) Weeks

## Course Objectives

- Build and Administer Systems
- Use Advanced Tools And Environments

• Integrate Computer Science Knowledge

## Course Objectives

- Work In A Team Environment
- Develop Communication Skills

Develop Interview Talking Points

## All-Hands Meetings

- MW, 3:00-3:50pm, 2445 Engineering Building
- Presentations By
  - Professor
  - Teams
    - Status Reports
    - Alpha and Beta Demonstrations
    - Formal Presentations
    - Project Videos
  - Guest Speakers

## All-Hands Meeting Agendas

09/02: Course Overview

09/07: (Labor Day, No Meeting)

09/09: Project Plan

09/14: Project Schedule & Risk

09/16: Teams: Status Reports

09/21: Prototyping

09/23: Resume Writing & Interviewing

09/28: Teams: Project Plans 09/30: Teams: Project Plans

10/05: Teams: Project Plans

10/07: Career Gallery

10/12: Creating & Giving Presentations

10/14: Teams: Alpha Demonstrations

10/19: Teams: Alpha Demonstrations

10/21: Teams: Alpha Demonstrations

10/26: Teams: Alpha Demonstrations

10/28: Camtasia Demo

11/02: The Project Video

11/04: Teams: Status Reports

11/09: Teams: Beta Demonstrations

11/11: Teams: Beta Demonstrations

11/16: Teams: Beta Demonstrations

11/18: Teams: Beta Demonstrations

11/23: Ethics and Professionalism

11/25: Teams: Status Reports

11/30: Intellectual Property

12/02: Teams: Status Reports

12/07: Teams: Project Videos

12/09: Teams: Project Videos

12/10: Design Day Setup

12/11: Design Day

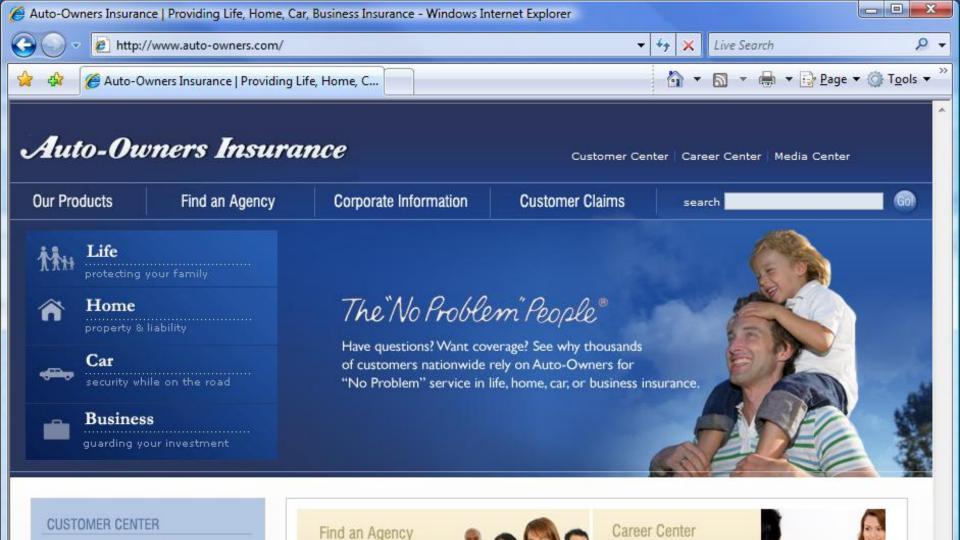
12/14: Teams: Project Videos

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### **Project Overview**

#### **Applications for Mobile Devices**

- Locate Independent Insurance Agent
  - Search by Name, Address, or Zip Code
  - Provide Agent Information
  - Show Locations with Maps
- Initiate Claim
  - Policy Information
  - Incident Description
  - Upload Photos
- Technologies
  - Windows Mobile
  - iPhone
  - Blackberry









## Screen Mockups

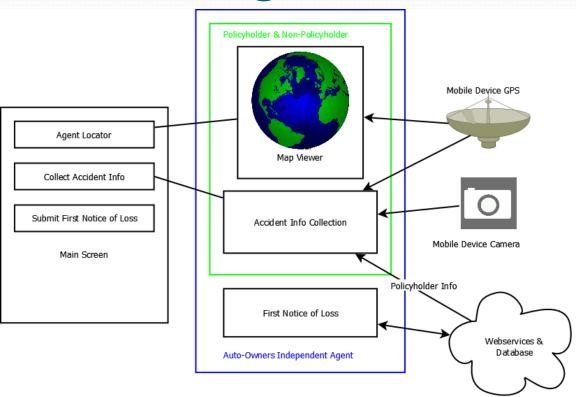




Accident Info	
Claimant 1	
First Name:	
Last Name:	
Phone Number:	
Plate Number:	
New Claimant	Submit Claim



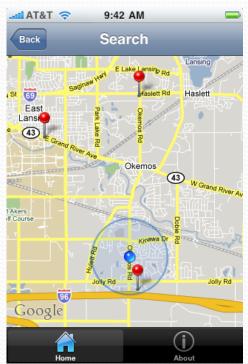
### **Architecture Diagram**





## Alpha Demonstration



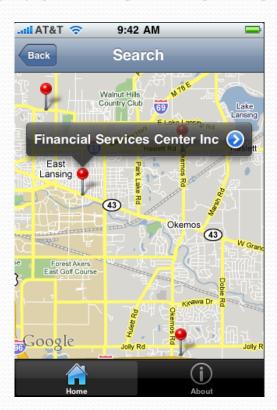






## The CSE Senior Capstone Experience

#### Team 1. Auto-Owners Insurance



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Involved Parties	>
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Summary	>
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## Senior Capstone Experience

#### Team 1. Auto-Owners Insurance







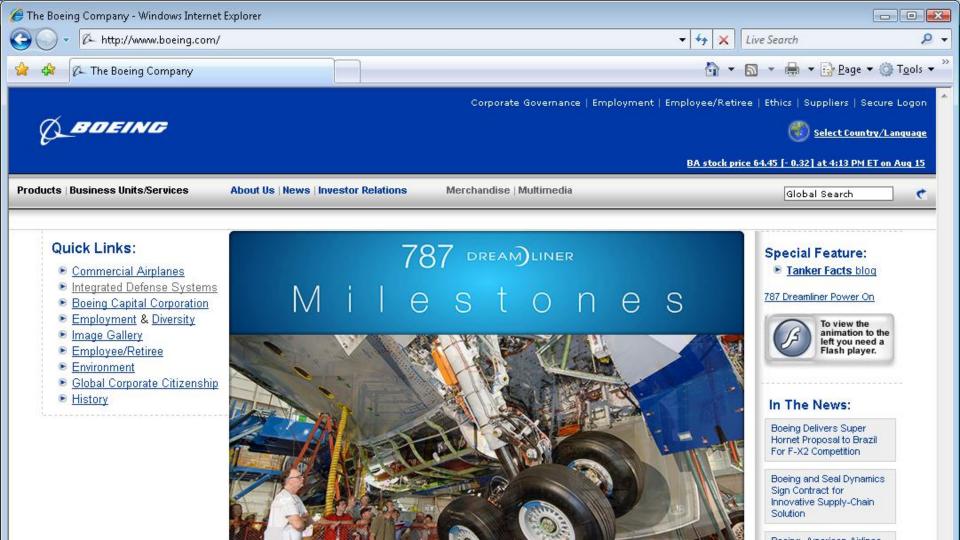
# The CSE Senior Capstone Experience

#### Team 1. Auto-Owners Insurance



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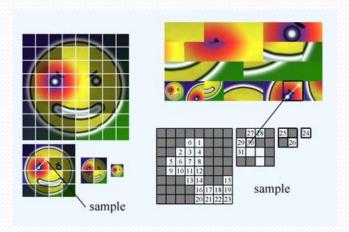




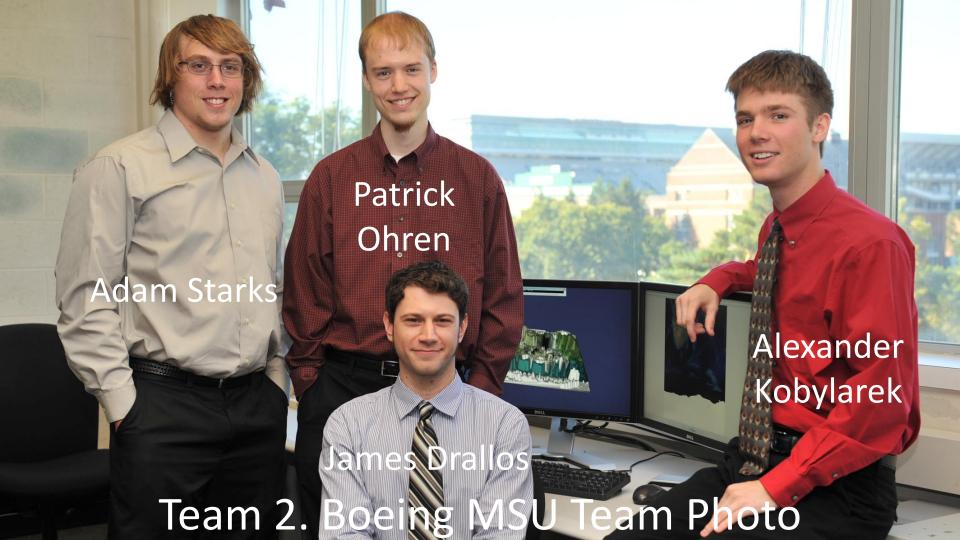
### **Project Overview**

#### **Sparse Visual Texturing**

- Sparse Virtual Texturing (SVT)
  - Simulate Large Textures with Much Less Texture Data
  - Download Smaller Data and Apply Pixel Shader
  - Map Virtual Large Texture to Actual Physical Texture
- Application of SVT to Ground Textures and Terrains
  - Ground Textures (Geotiffs)
  - Terrain Databases (OpenSceneGraph IVE)
- Integration of SVT into Boeing Virtual Application Suites
  - Flight, Urban Combat, Etc...
  - Control of SVD Parameters via GUI
  - Include Fly, Drive, Skim, Traverse, Move
- Technologies
  - Geotiffs
  - OpenSceneGraph
  - Virtual Planet Builder

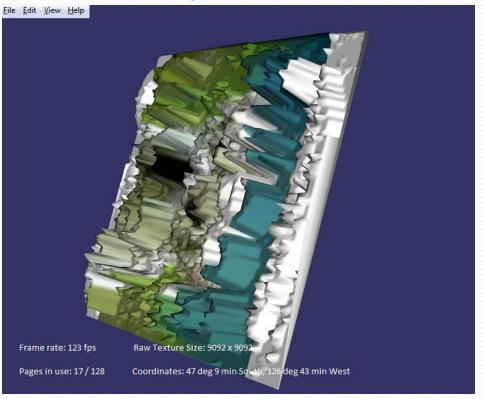






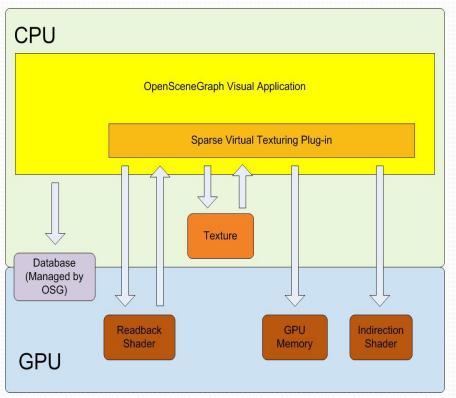


## Screen Mockup



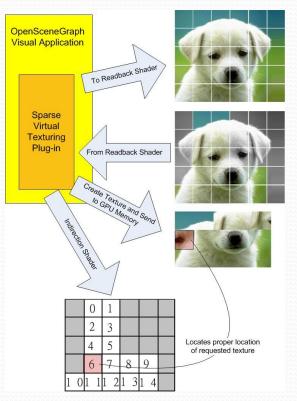


## Architecture Diagram

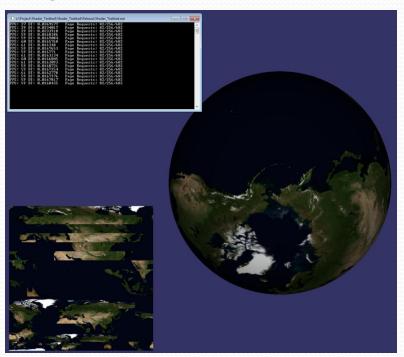


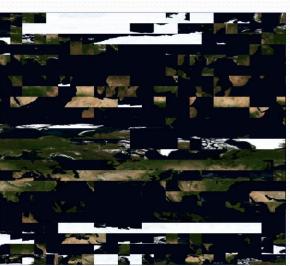


## Alpha Demonstration



## **Alpha Demonstration**



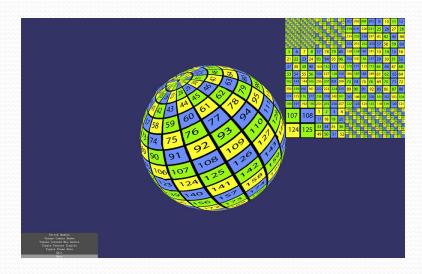




# The CSE Senior Capstone Experience

#### Team 2. Boeing

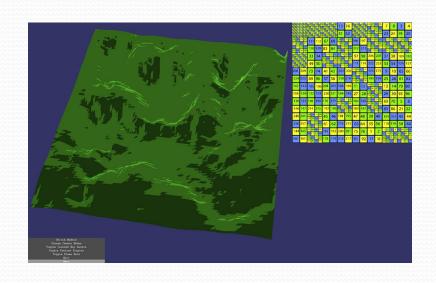


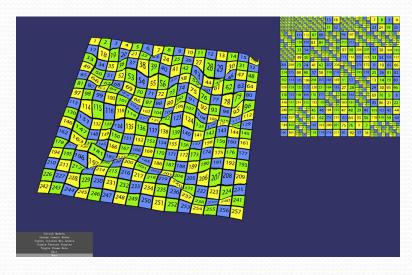




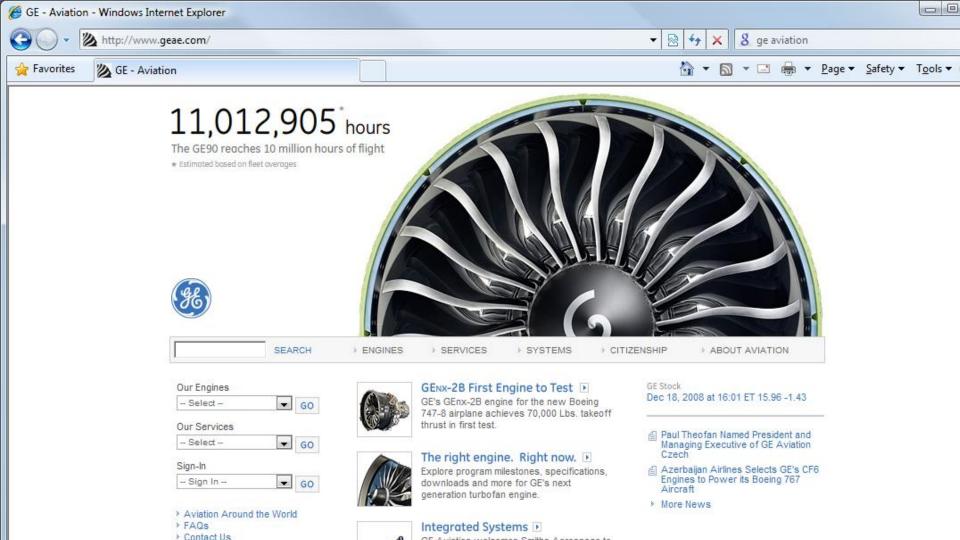


## Team 2. Boeing







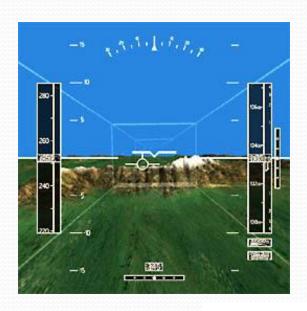


## **Project Overview**

### Synthetic Vision Display (SVD)

- Existing Airplane Attitude Indicator (FAA Part-25)
  - Indicates Pitch, Roll & Heading
  - Two-Dimensional
  - Head-Down
- New SVD Attitude Indicator
  - Indicates Pitch, Roll & Heading
  - Adds Third Dimension
    - Forward Looking (Egocentric) Terrain
    - Flight Path Vector
    - Distance and Closure Rates
    - Lateral Map View
    - Side Vertical Profile View
- Integrate with XPlane
- Technologies
  - SVD
  - Terrain Databases

- Open GL
- XPlane

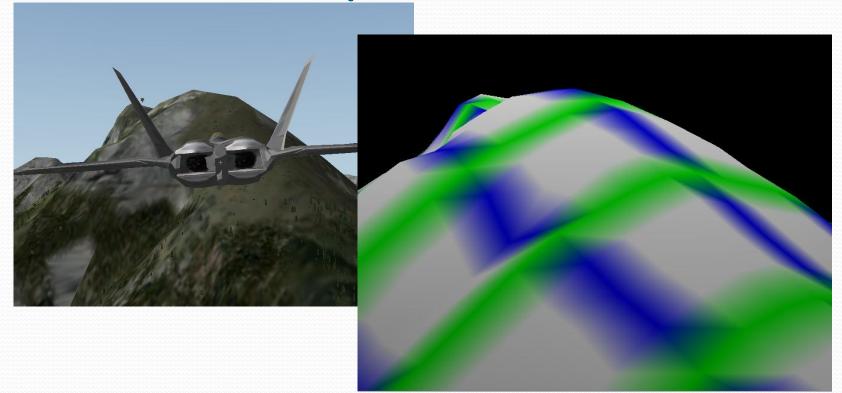






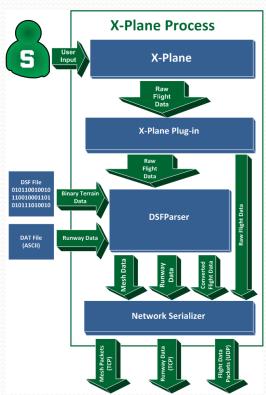


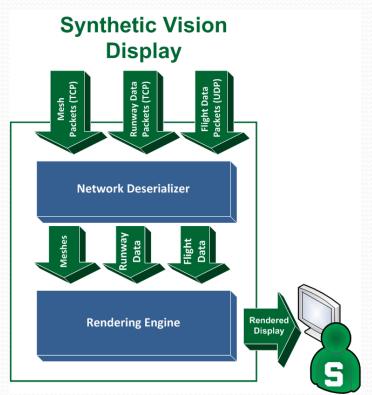
# Screen Mockups



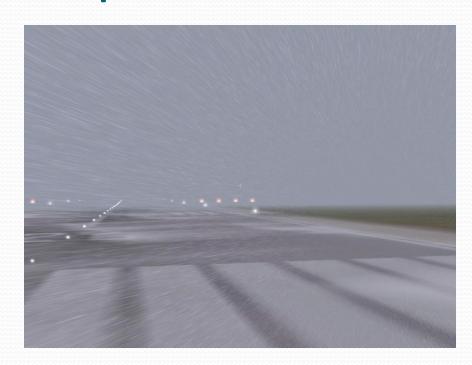


# **Architecture Diagram**

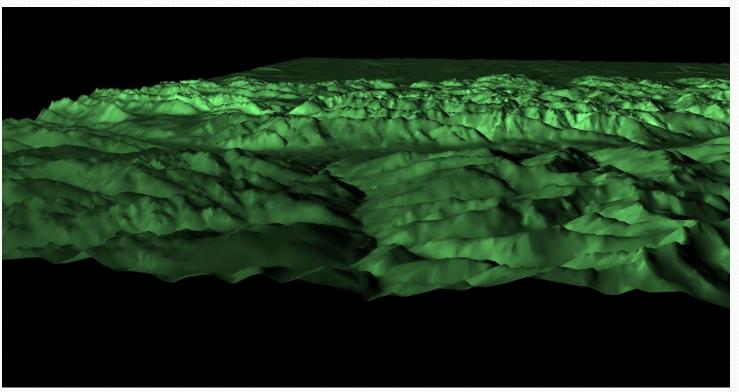






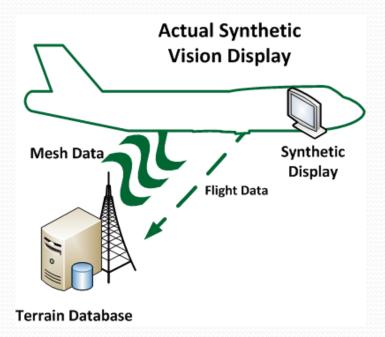


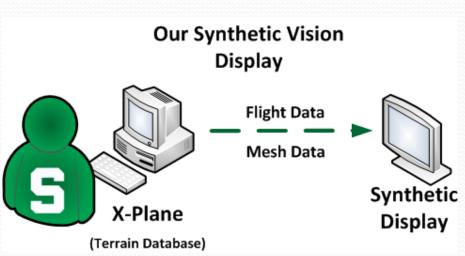






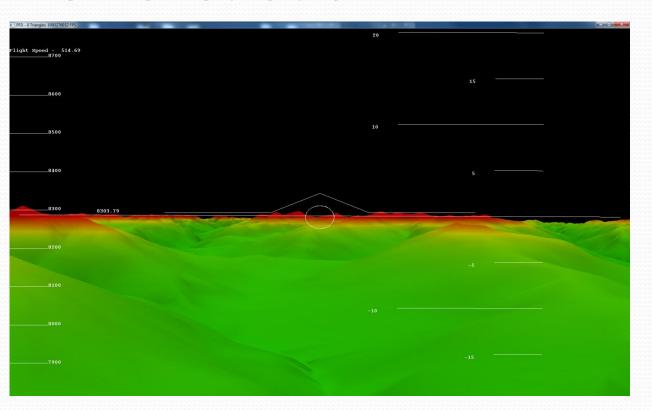
## **Beta Demonstration**





The CSE Senior Capstone Experience









## **Project Overview**

#### **ITS Scorecard Dashboard**

- ITS (Information Technology Services) Scorecard
  - Existing System
  - BMC Remedy Applications
    - Includes Database of ITS Activities
    - Incident (Trouble Tickets) and Change Management
- ITS Scorecard Dashboard
  - New Dashboard Interface to Remedy Database
  - Features
    - Spotlighting of Actual v . Goal
    - Drill-down
    - Trending (Up/Down and Rolling)
    - Alerts/Notification
    - Consistency of Delivery and Format
- Technologies
  - SharePoint 2007
  - Visual Studio 2007



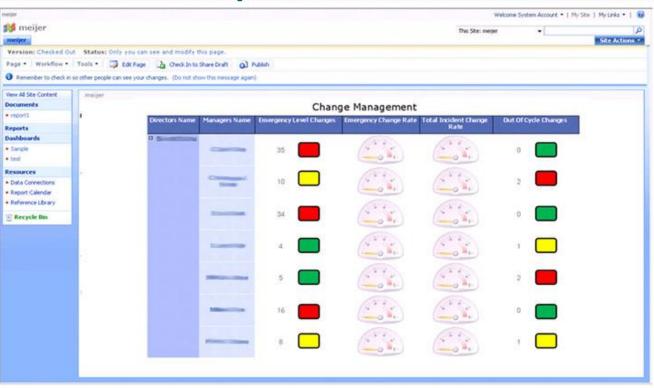
- Office 2007
- SQL Server 2008





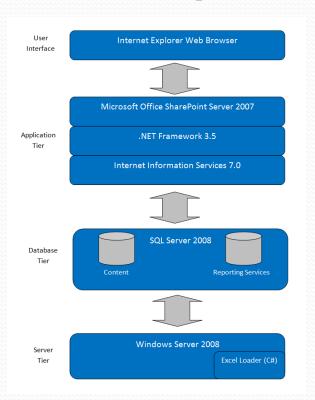


# Screen Mockup



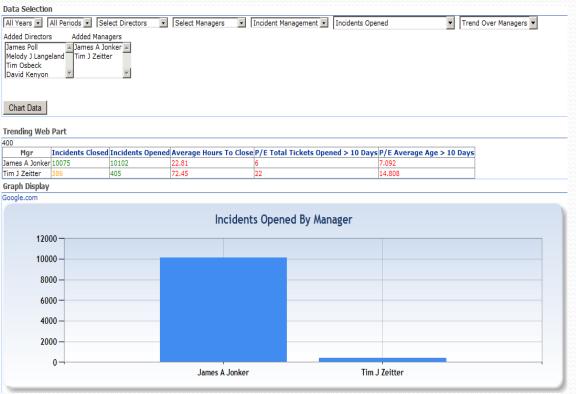


# **Architecture Diagram**



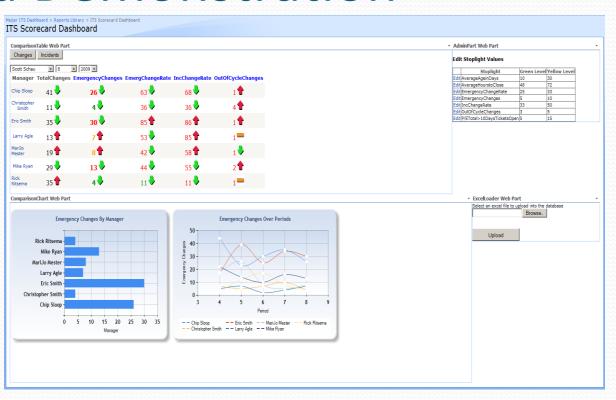


















#### Team 5. Motorola

## **Project Overview**

#### User Generated Video Service for the iPhone

- User Videos from iPhone to Home TV
  - Users Generate and Upload Videos with iPhone
  - Family and Friends View Videos with Home Cable TV
- Software Components and Features
  - RESTful Video Services
  - Video On Demand (VOD)
  - Social Networking
    - Allow Friends to View Videos
    - View Friends' Videos
  - Cable TV Set Top Box (STB) Interface
- Technologies
  - iPhone Development
  - Advanced Java and JEE
  - RESTful Web Services



- AJAX
- Video On Demand (VOD)
- Multimedia Development







# Screen Mockups





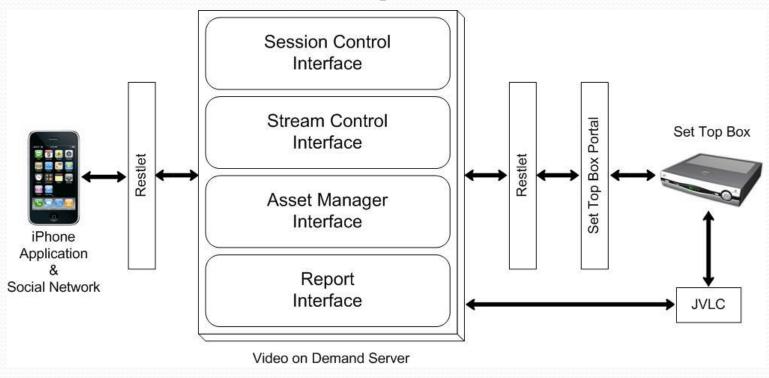
# Screen Mockups







# **Architecture Diagram**









# The CSE Senior Capstone Experience

#### Team 5. Motorola



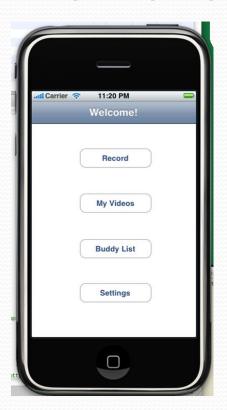






# The CSE Senior Capstone Experience

#### Team 5. Motorola

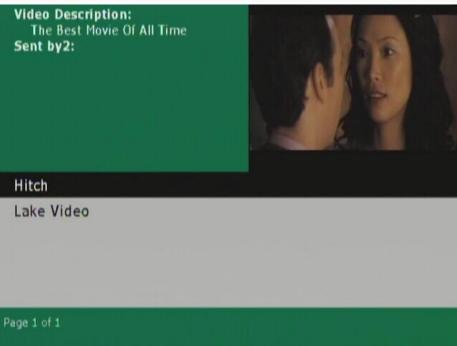


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My Videos	
Title:	
Description: A video about a lake.	
Buddies	













## **Project Overview**

#### **Microsoft Team System Custom Client**

- Microsoft Team System
  - Application Life Cycle Management
  - Integrated Into Visual Studio
  - Too Limited for TechSmith Environment
- Create Custom Team System Client
  - Support Multi-Platform Applications
  - Support Multi-Disciplinary Teams
    - Software Engineers
    - User Experience Designers
    - Test Specialists
    - Information Developers
    - Project Managers
- Technologies
  - Microsoft Team System 2008
  - Microsoft Silverlight



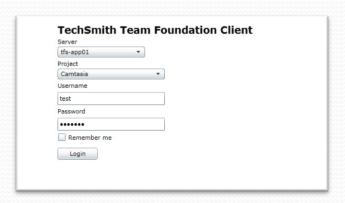


- Microsoft Team Foundation Server
- SCRUM Agile Development Methodology





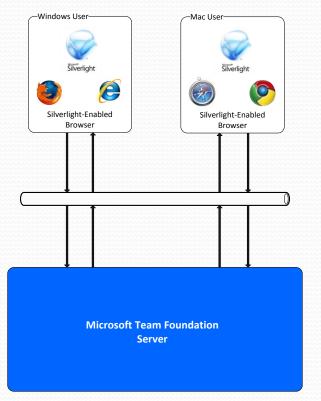
# Team 6. TechSmith Screen Mockup

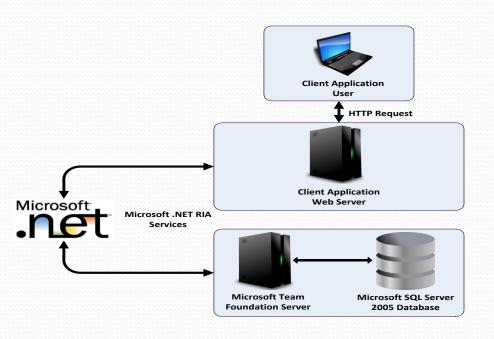


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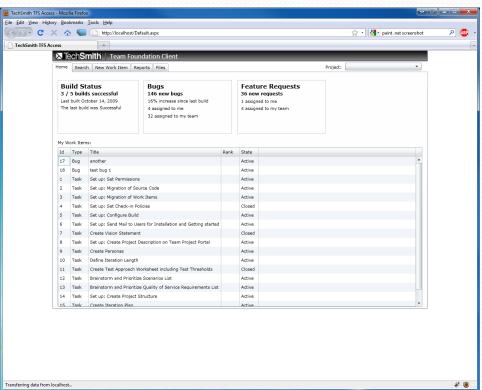


### **Architecture Illustrated**

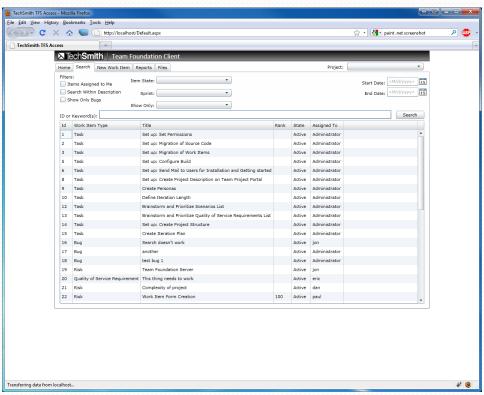








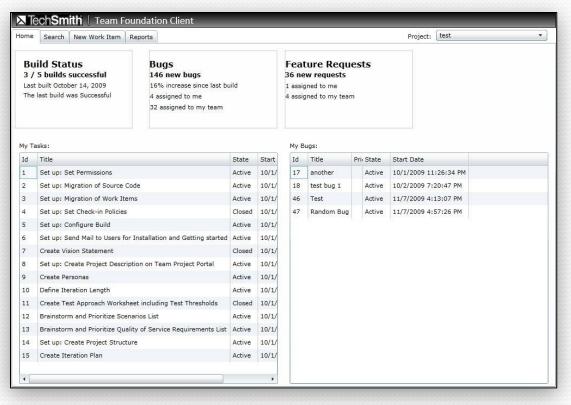






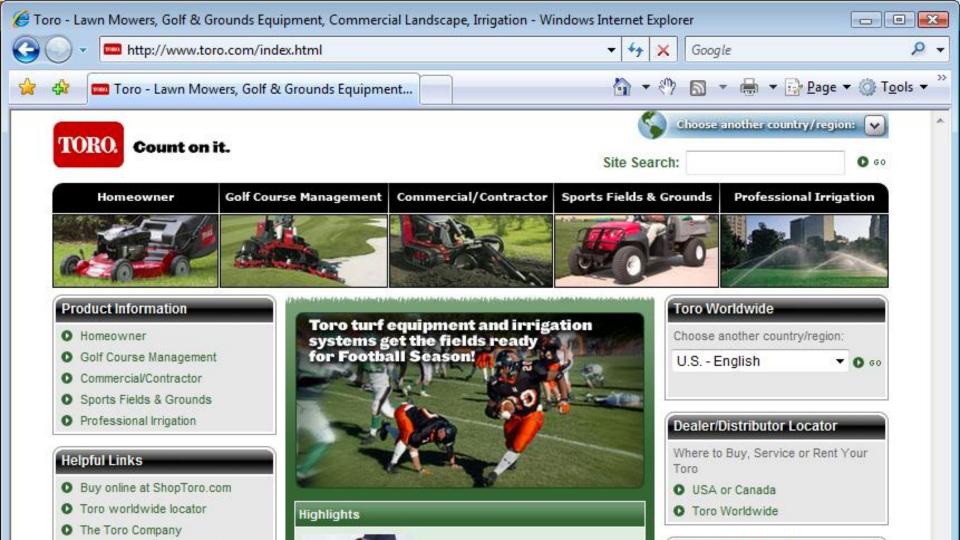
# Experience Senior Capstone CSE

#### Team 6. TechSmith





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#### Team 7. Toro

# **Project Overview**

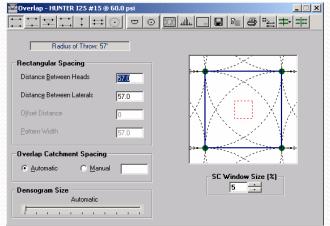
**Irrigation Distribution Uniformity Analysis** 

- Irrigation Nozzle Development Testing
  - 20' x 20' Grid Centered on Test Nozzle
  - Water Collection Pressure Sensors at Each Grid Point
- **Existing System** 
  - Data Stored in Comma Separated File
  - Analyzed Using Space Pro Software
- Proposed System
  - Custom Web-Based Analysis Tool
  - **Automatic and Manual Modes**
  - **Edit Datasets**
  - Display Graphs and Statistics
- Technologies
  - Visual Studio 2008

Microsoft Access

LabVIEW

Space Pro



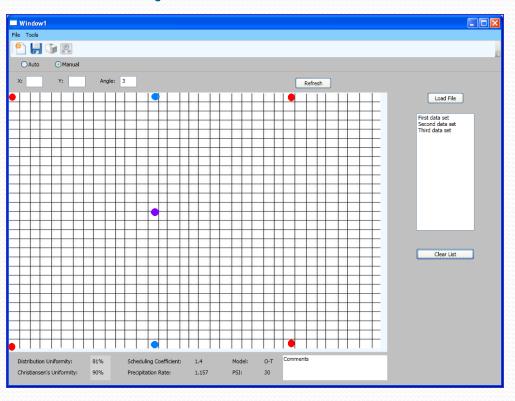






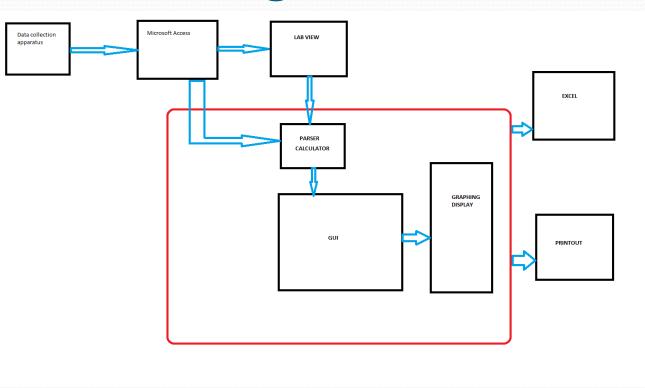
#### Team 7. Toro

# Screen Mockup



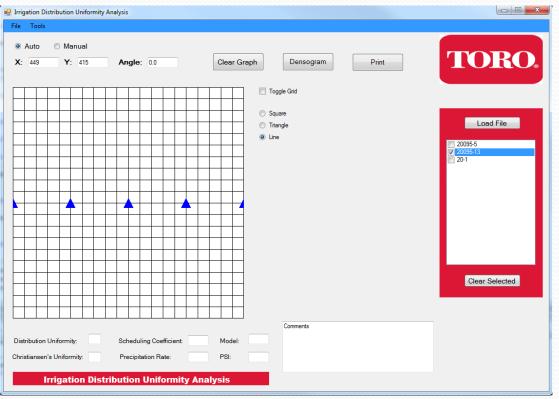


## Architecture Diagram





## **Alpha Demonstration**

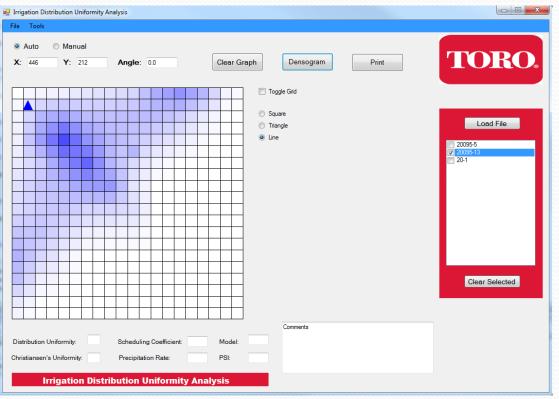




## Experience Senior Capstone The CSE

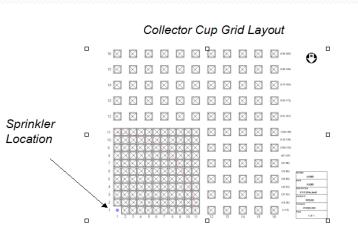
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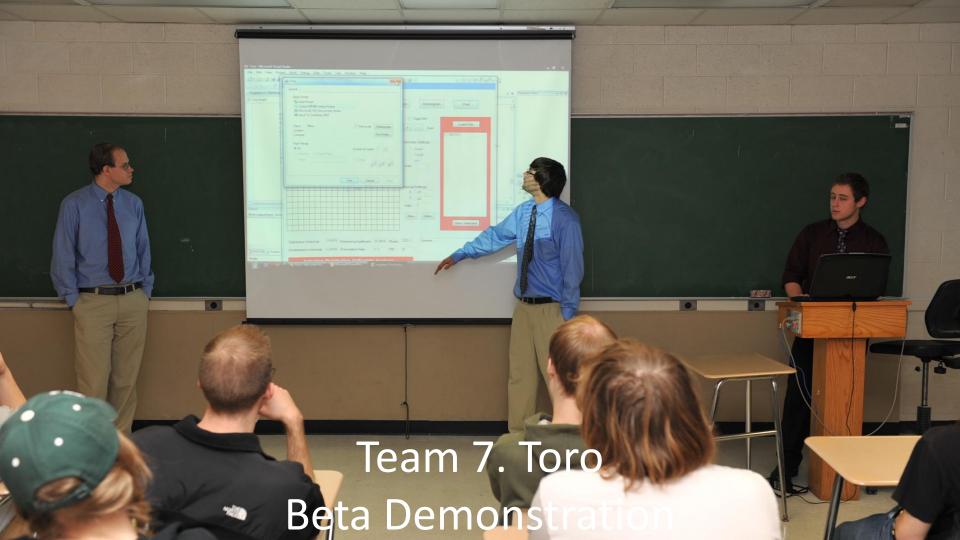
Alpha Demonstration



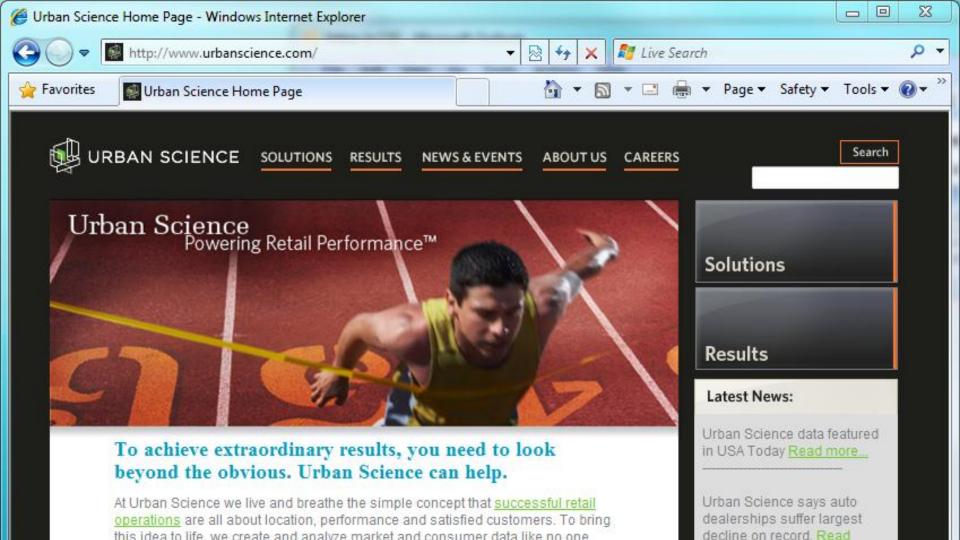








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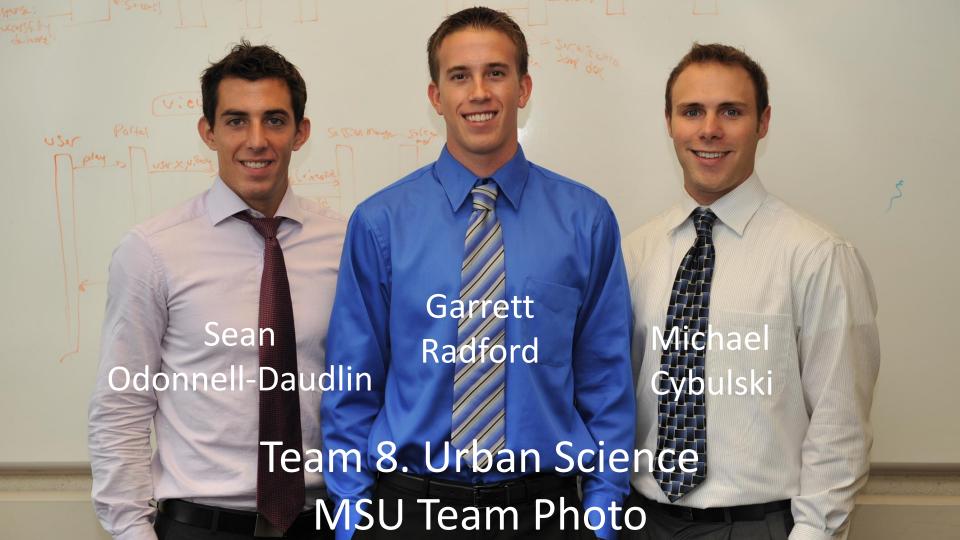
## **Project Overview**

#### **Automobile Dealership Dashboard**

- Urban Science Products
  - For Automobile Dealerships and OEMs
  - Tools to Analyze Operational Performance
  - Vitally Important in Current Economy
- Dealership Dashboard
  - Portal to Urban Science Products
  - Modern Dashboard Graphical User Interface
  - Include Text, Charts, Graphs, Gauges, etc...
  - Utilize Integrated Site Solution (ISS)
  - Maintain Urban Science Brand Image
- Technologies
  - Microsoft Visual Studio
  - Integrated Site Solution (ISS)
  - ChartFX

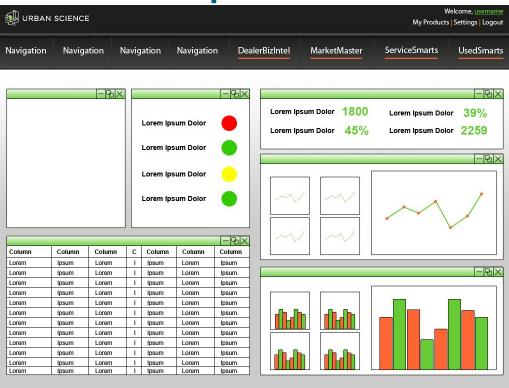






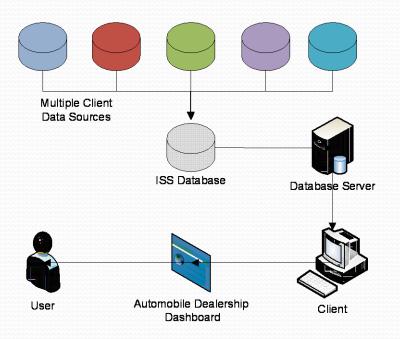


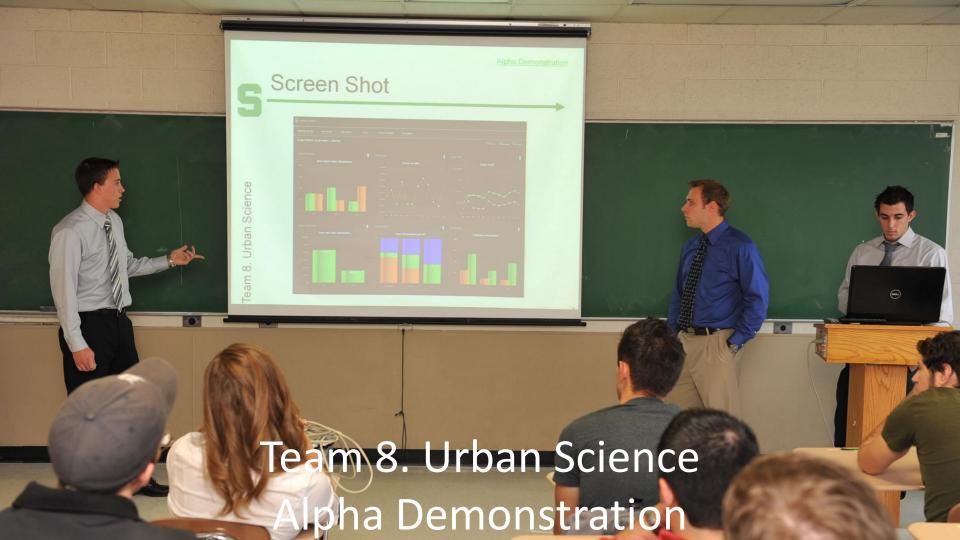
Screen Mockup



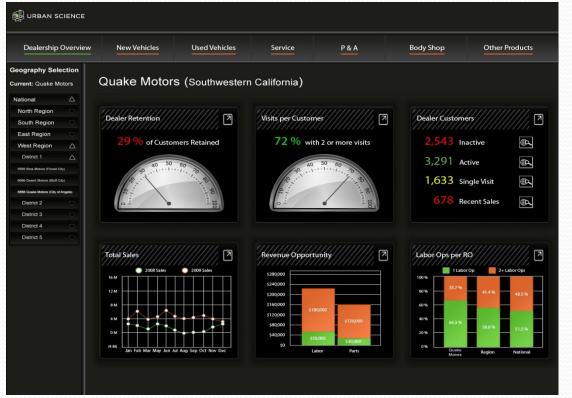


## **Architecture Diagram**



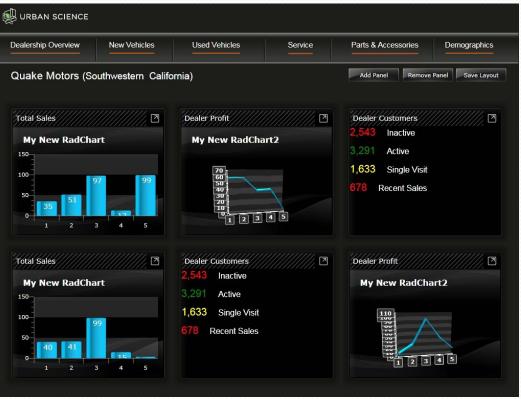


# Team 8. Urban Science Alpha Demonstration



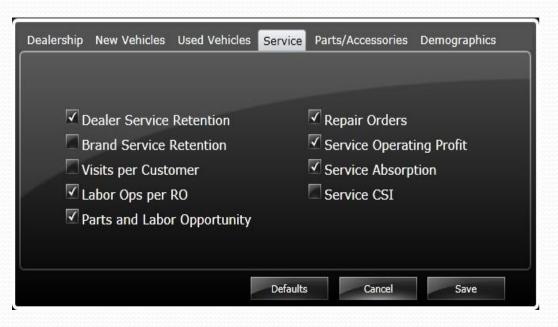


### Alpha Demonstration

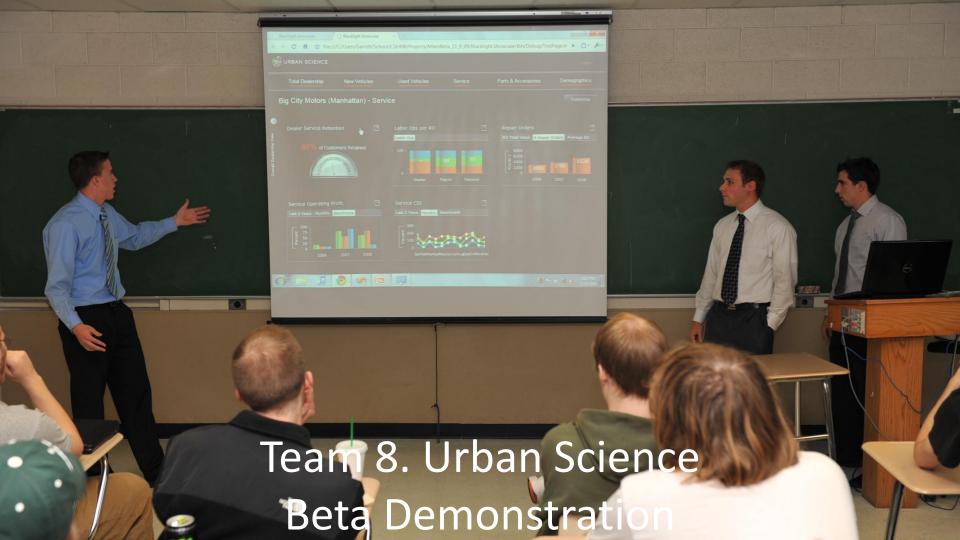










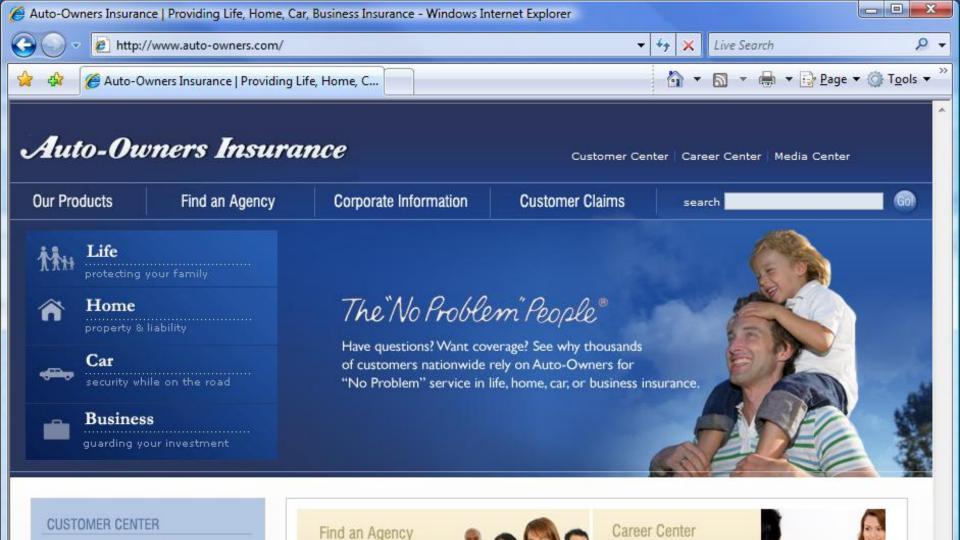


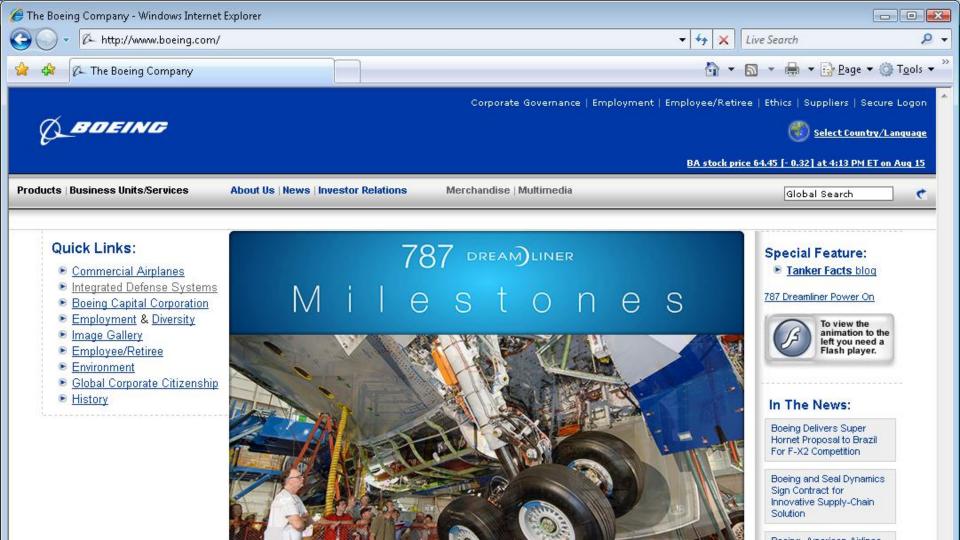
## The Computer Science Senior Capstone Experience

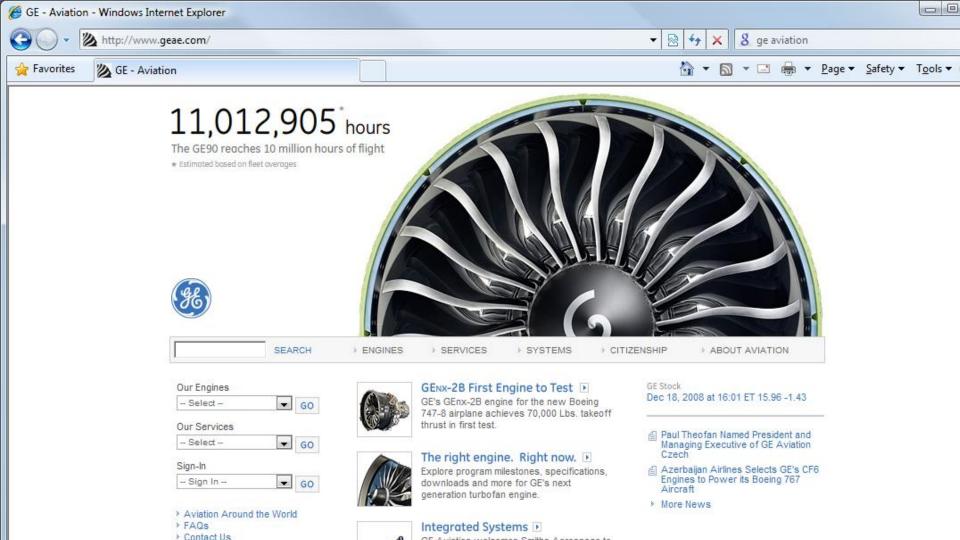
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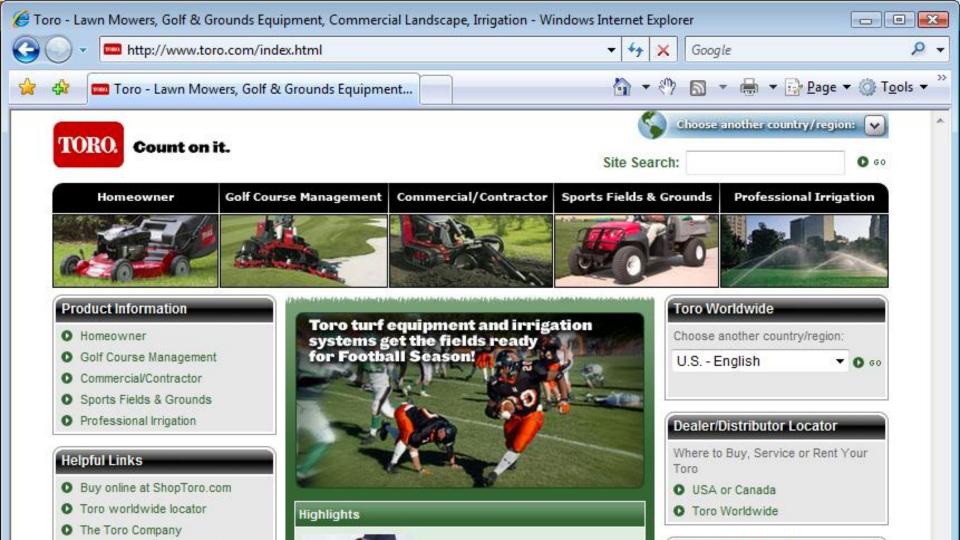


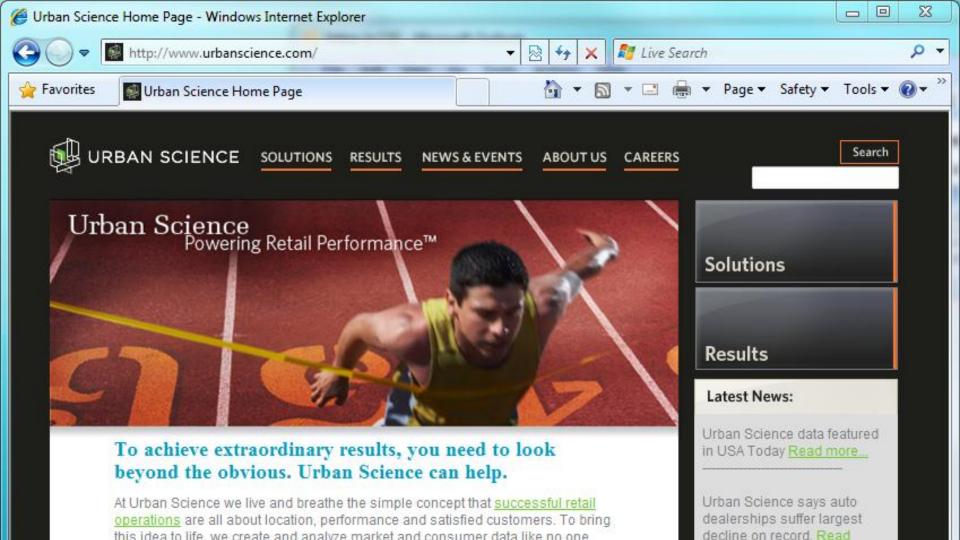










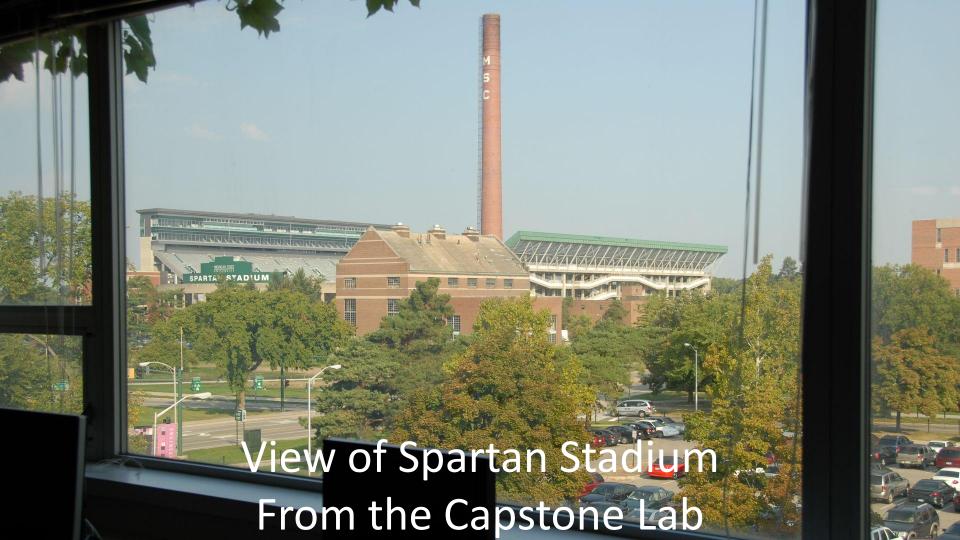


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Department of Computer Science and Engineering Michigan State University Fall 2009

Professor Wayne Dyksen





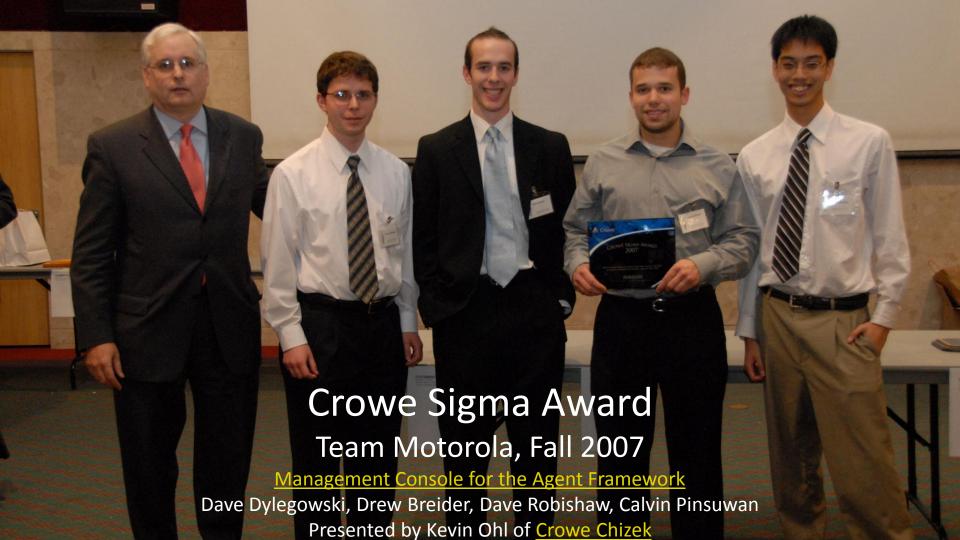
# The Computer Science Senior Capstone Experience

Design Day Award Winners

December 5, 2007









### The Computer Science Senior Capstone Experience

Design Day Award Winners

April 25, 2008









### The Computer Science Senior Capstone Experience

Design Day Award Winners

December 7, 2008







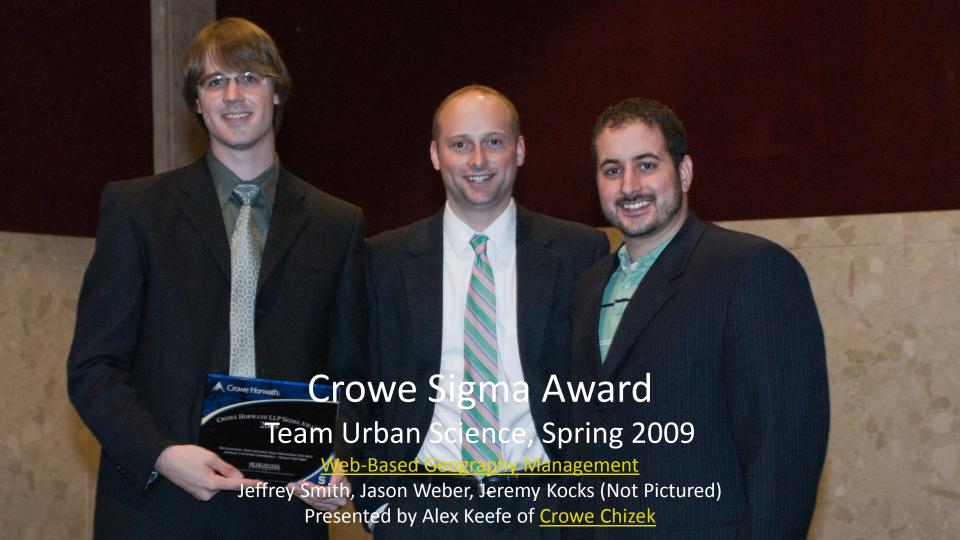


# The Computer Science Senior Capstone Experience

Design Day Award Winners
May 1, 2009









# The Computer Science Senior Capstone Experience

Design Day Award Winners

December 11, 2009







