08/30: Capstone Overview

The Capstone Experience

Dr. Wayne Dyksen
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Michigan State University
Fall 2017
Capstone Overview

Course Logistics

• Client Projects

• Course Logistics (Continued)
CSE 498, Collaborative Design

• “The Capstone Experience”
• Instructors
  ▪ Dr. Wayne Dyksen (“Dr. D.”)
  ▪ Jonny Dowdall
  ▪ James Mariani
• Class Meetings
  MW, 3:00-4:20pm, 1279 Anthony
• Syllabus
• Web Site
  ▪ capstone.cse.msu.edu
  ▪ Check it often.
• Email
  ▪ Check it often.
  ▪ Read it thoroughly and carefully!
Course Goals

• Give You Experience In
  ▪ Real World
  ▪ Corporate Setting

• Start Your Transition
  ▪ From Student...
  ▪ ...To Professional
Course Goals

- Teams of Students
- Build Significant Software System
  - Design
  - Develop
  - Debug
  - Document
  - Deliver
- For Corporate Clients
- In 15 (Short) Weeks
Course Goals

• Build a Significant Software System
• Work in a Team Environment
• Learn New Tools and Environments
• Build and Administer Systems
• Develop Your Communication Skills
• Develop Interview Talking Points
• Learn to Do Stuff on Your Own
• Etc…
Project Deliverables

• Project Plan Document & Presentation
• Alpha Presentation
• Beta Presentation
• Project Software & Documentation
• Project Video
• Design Day

See Major Milestones.
All-Hands Meetings

Presentations By

• Dr. D.
• TAs
• Teams
  ▪ Status Reports
  ▪ Formal Presentations
    o Project Plan
    o Alpha
    o Beta
  ▪ Project Videos
• Guest Speaker(s)
All-Hands Meetings Agendas

- 08/30: Capstone Overview
- 09/04: (Labor Day, No Meeting)
- 09/06: Project Plan
- 09/11: Risks and Prototypes
- 09/13: Team Status Report Presentations
- 09/18: Team Project Plan Presentations
- 09/20: Team Project Plan Presentations
- 09/25: Team Project Plan Presentations
- 09/27: Team Project Plan Presentations
- 10/02: Resume Writing and Interviewing
- 10/04: Career Gallery
- 10/09: Schedule and Teamwork
- 10/11: Creating and Giving Presentations
- 10/16: Team Alpha Presentations
- 10/18: Team Alpha Presentations
- 10/23: Team Alpha Presentations
- 10/25: Team Alpha Presentations
- 10/30: Design Day and the Project Videos
- 11/01: Camtasia Demo
- 11/06: Intellectual Property
- 11/08: Ethics and Professionalism
- 11/13: Team Beta Presentations
- 11/15: Team Beta Presentations
- 11/20: Team Beta Presentations
- 11/22: Team Status Reports
- 11/27: Team Beta Presentations
- 11/29: Team Status Reports
- 12/04: Project Videos
- 12/06: Project Videos and All Deliverables
- 12/07: Design Day Setup
- 12/08: Design Day
- 12/11: Project Videos

Nota Bene
Urban Science Capstone Lab

• **3352 EB**
• **Door Lock**
  ▪ Electronic Keypad
  ▪ Code = ########
  ▪ Do Not Give Out to Other Students
• **Systems**
  ▪ Up to Four per Team
    ○ Two 27” iMacs
    ○ One Dell Rack-Mounted Server (Optional)
    ○ One Mac Book Pro (Optional)
  ▪ Team 100% Responsible
    ○ Building
    ○ Maintaining
    ○ Securing
    ○ Backing Up
• **Books**
• **WiFi**
  ▪ SSID: CSE498, CSE498 5MHz
  ▪ Key: ????????
• **Conference Area**
  ▪ Team Meetings
  ▪ Client Conference Calls
  ▪ Google Conference Calendar
• **Appliances**
  ▪ Water Cooler/Heater
    Nota Bene: The water cooler is not connected to a drain. Do not pour things into it, like rinsing out your water container.
  ▪ Whirlpool Refrigerator
    ○ Cold Water From Bottled Water
    ○ Ice From Bottled Water
  ▪ Microwave
  ▪ Keurig Coffee Maker
• **Lockable Storage**
  ▪ One Drawer Per Team
  ▪ As Needed
  ▪ Assigned by Dyksen and TAs
  ▪ Obtain Keys from CSE Office
Scheduled Lab Times

• No Formal Lab Sessions
• “Credit” for Scheduled Weekly Meetings
  ▪ Team Meetings
  ▪ Client Conference Calls
  ▪ Triage Meetings with TAs
• Meeting Times TBA With
  ▪ Team
  ▪ Client
  ▪ TAs
• Students must be available to meet in person.
  ▪ Team Meetings
  ▪ Triage Meetings
  ▪ Client Conference Calls
CSE498 Prerequisites

Must Have Successfully Completed

• Tier I Writing Requirement
• CSE335
• CSE410
• Another 400-Level CSE Course Other Than CSE491
Capstone Overview

Course Logistics

Client Projects

• Course Logistics (Continued)
Team / Project Generalities

• Clients
  ▪ Vary in Size and Type
  ▪ Client contacts/mentors are “volunteers.”

• Team Contact Person
  ▪ Picked By Team
  ▪ Main Point of Contact for Client
Team / Project Generalities

• Project Types
  ▪ All Significant Software Development
  ▪ Vary in Specifics

• Project Level of Difficulty
  ▪ Hard Enough
  ▪ But Not too Hard

• Deliverable
  ▪ To the Client
  ▪ By the Due Date
Team / Project Generalities

- Challenges
  - Very Short, Unforgiving Time Line
  - Client Contact
  - Team Dynamics
  - Project Plan (in Three Weeks)
  - Entirely New...
    - Languages
    - Environments
    - API’s
    - SDK’s
    - Processes
    - Protocols
    - Etc.
  - Project Management
  - Etc...
Project Specifics

• Vary
  ▪ Type
  ▪ Current State of Specificity

• Challenge
  ▪ Connect with Client
  ▪ “Nail Down” the Project
    o Hard Enough
    o Not too Hard
    o Avoid Feature Creep
  ▪ Course Feature, Not Bug
Intellectual Property and Non-Disclosure Agreements

• Intellectual Property Agreement
  ▪ You agree to assign ownership of intellectual property that may be created as a result of your project to your client.
    ○ Copyrightable Program Code
    ○ Patentable “Ideas”
  ▪ Most clients will require an IP agreement.

• Non-Disclosure Agreement
  ▪ You agree not to disclose client confidential information.
  ▪ Most clients will require an NDA.

• To date...
  ▪ Most code has not gone directly into production.
  ▪ No patents have resulted.

• Use agreements provided by MSU.
• Always Contact Dr. D. Before Signing Anything
Project Teams

- Team Amazon
- Team Auto-Owners
- Team Avata
- Team Ford
- Team GM
- Team Humana
- Team Meijer
- Team Michigan State
- Team Microsoft
- Team Mozilla
- Team MSUFCU
- Team Phoenix
- Team Rook
- Team Spectrum Health
- Team Symantec
- Team TechSmith
- Team TWO MEN AND A TRUCK
- Team Union Pacific
- Team Urban Science
- Team Yello
Team Amazon

Project Overview

Faia: Fashion Artificial Intelligence Assistant

• Functionalities
  ▪ Create Innovative Fashion Shopping Experience
  ▪ With Virtual Personal Stylist

• Features
  ▪ Create and Manage Shopper Profile
  ▪ Interact with Faia via Texting
  ▪ Give Personalized Fashion Recommendations
  ▪ Leverage AI to Learn and Adapt to Shopper Preferences
  ▪ Provide “Save for Later” and “Add to Cart”
  ▪ Integrate with Prime Wardrobe

• Technologies
  ▪ Amazon Web Services (AWS)
    o Compute Services
    o Database Services
    o Machine Learning
  ▪ Amazon Lex
  ▪ Amazon Product Advertising API
  ▪ Amazon Simple Notification Services (SNS)
  ▪ Twilio APIs
Team Auto-Owners

Project Overview

House of Hazards

• Functionalities
  ▪ Teach Homeowners About Home Safety
  ▪ With a Virtual Reality Game
  ▪ Using an Oculus Rift

• Features
  ▪ Design and Build Time-Based Virtual Reality Game
  ▪ Build Virtual Model of Single-Family Home
  ▪ Display Various Scenarios Inside and Outside
    ▪ Hazardous
    ▪ Safe
    ▪ Innocuous
  ▪ Support Various Levels of Difficulty
  ▪ Provide Limited Hints
  ▪ Use Randomization for Varied Experiences
  ▪ Show Review Panel At Game End

• Technologies
  ▪ Unity Game Engine
  ▪ Oculus Rift
  ▪ Oculus Rift Touch Controllers
  ▪ Oculus Rift Sensor
Team Avata

Project Overview

Security Analytics Suite: Configuration Setup Tool

- **Functionalities**
  - Transform and Ingest Various Data Formats
  - Into Ava for Public Safety Solution
  - To Reduce Customer Acquisition Cost and Time

- **Features**
  - Design and Build Interactive User Interface
  - Provide Way to Map User’s Taxonomy to Avata’s Taxonomy
  - Use ReactJS for Mapping User Interface
    - Draw on Map
    - Capture Date and Time Ranges
    - Create Hierarchical Ontologies
  - Support JSON, SQL and MySQL Configurations

- **Technologies**
  - React JS
  - Java 8
  - Spring Boot framework
  - Hibernate Framework
  - JSON, SQL and MySQL
  - ArcGIS Mapping Tools
  - RESTful Web Services

The Capstone Experience
Team Ford

Project Overview

Ford Smart Parking

• Functionalities
  ▪ Notify Drivers of Nearby Available Parking Spaces
  ▪ That Fit Their Model Vehicle
  ▪ Using Ford’s Sync 3

• Features
  ▪ Create and Manage User Profiles
  ▪ Enable User Flagging of Open Parking Spaces
    o Dimensions
    o GPS Location
    o Timestamp
  ▪ Integrate with Google Tango
  ▪ Send Notifications to Sync 3
    o Receives Notifications of Available Spaces
    o Notifies Remote Server When Space Taken
  ▪ Design and Build Sync 3 App

• Technologies
  ▪ Lenovo Phab 2 Pro
  ▪ Google Android Tablets and Phones / Java
  ▪ Google Tango
  ▪ Java 2 Platform Enterprise Edition (J2EE)
  ▪ Sync 3 Emulator and AppLink
  ▪ Microsoft SQL Server 2016
Team GM

Project Overview

Automated Video Workplace Safety System

• Functionalities
  ▪ Alert Employees of Safety Issues and Situations
  ▪ Using Computer Analysis of Real-Time Camera Feeds

• Features
  ▪ Design and Build Web and Mobile Apps
  ▪ Utilize Camera to Watch Area of Concern
  ▪ Leverage Image Recognition and Machine Learning (ML)
  ▪ Identify People and Personal Protective Equipment (PPE)
    o Helmet
    o Eye Protection
    o Hearing Protection
    o Vest
  ▪ Determine Safety Alerts
    o Send to Mobile App
    o Record in Centralized Database
  ▪ Produce Summary Reports for Management

• Technologies
  ▪ CSS / HTML / JavaScript / PHP
  ▪ Google Android Tablets and Phones / Java
  ▪ nVidia Deep Learning SDK
  ▪ nVidia DGX-1 Deep Learning Hardware
  ▪ Image Recognition
  ▪ Machine Learning (ML)
  ▪ Mobile Push Notifications
Team Humana

Project Overview

MyHumanaBot

• Functionalities
  ▪ Provide Instant Information to Customers
  ▪ About Plans, Claims, Etc.
  ▪ Via a Chatbot

• Features
  ▪ Build and Design Two Web Apps
    o MyHumanaBot App
    o Humana Administrative App
  ▪ Supports
    o Customer or Non-Customer
    o Logged In or Not Logged In
  ▪ Handles Variety of Scenarios
    o Information About Plans
    o Claims Status
    o Humana Pharmacy Status
    o Finding a Doctor
    o Etc.
  ▪ Incorporate Context
  ▪ Maintain Conversation History
  ▪ Account for Security

• Technologies
  ▪ Microsoft C# / .NET
  ▪ SQL / MySQL / Mongo Database
  ▪ RESTful Web Services

The Capstone Experience

Humana
Louisville, Kentucky
Team Meijer

Project Overview

Meijer Fresh-ipes

- Functionalities
  - Streamline and Simplify Shopping
  - By Providing Meal and Menu Planning
  - Intelligently and Interactively

- Features
  - Track Customer Shopping History
  - Determine Likely Existing Household Ingredients
  - Recommend Range of Recipes
    - Ingredient Availability
    - Food Preferences
  - Create Shopping List for Missing Ingredients
  - Integrate with mPerks

- Technologies
  - Amazon Echo Show
  - Microsoft .NET Framework, C#, ASP.NET
  - Microsoft Azure Mobile Services
  - Microsoft Visual Studio Team Server
  - Xamarin
  - Meijer Web Services
  - Application Insights
  - Hockey App
  - SQL Server
Team Michigan State University

Project Overview

SEA: Spartan Experience App

• Functionalities
  ▪ Enhance Student Experience
  ▪ By Providing Information to Students
  ▪ With Easy-to-Use Mobile App

• Features
  ▪ Support Android and iPhone Natively
  ▪ Utilize Amazon Web Services (AWS)
  ▪ Any and All Of...
    ▪ Provide Directions to Parking and Buildings
    ▪ Show Cafeteria Menus
    ▪ Display Campus Activities and Events
    ▪ Show Emergency Phone Numbers
    ▪ Provide News Feed and Twitter Feed
    ▪ Create and Manage a Student Planner
    ▪ Handle Course Search and Schedule Planner
    ▪ Implement a Degree Navigator
  ▪ Incorporate Existing CATA Bus Tracker

• Technologies
  ▪ Apple iPads and iPhones (iOS) / Swift
  ▪ Google Android Tablets and Phones / Java
  ▪ RSS News Feeds
Team Microsoft

Project Overview

Enhanced Company Portal with Graph

- Functionalities
  - Enhance Android Company App
  - By Leveraging Microsoft Graph API
  - Making Customers More Productive

- Features
  - Use Only Microsoft Graph
    - For All Data
    - To Add Functionality Beyond Device Management
  - Provide Social Interaction
    - Organize Team Documents
    - Create Team Channels
    - Track Recently Used Files
  - Increase Usefulness Beyond Existing Portal
  - Refresh User Interface

- Technologies
  - Microsoft Intune
  - Microsoft Graph
  - Microsoft Windows / C#
  - Google Android Tablets and Phones / Java
  - Apple iPads and iPhones (iOS) / Swift
  - RESTful Web Services
Team Mozilla

Project Overview

Taking Firefox Screenshots Testing Suite to 11

• Functionalities
  ▪ Improve Firefox Screenshots Testing Suit
  ▪ So Results Are More Readily Available
  ▪ For Firefox Development Community at Large

• Features
  ▪ Move Testing Suite from Tier 2 to Tier 3
  ▪ Support Cropping Rules
  ▪ Reduce Intermittent Failures and Difference Alerts
  ▪ Produce Easily Consumable and Interpretable Test Results
  ▪ Add New Testing States

• Technologies
  ▪ CSS
  ▪ JavaScript
  ▪ Python
  ▪ XUL / XBL
  ▪ Mercurial
  ▪ IRCCloud
  ▪ Bugzilla
  ▪ Review Board
  ▪ Windows
  ▪ OS X
  ▪ Linux
Team MSUFCU

Project Overview

Digital Banking with Chatbots

• Functionalities
  ▪ Provide Virtual Banking Assistance
  ▪ Using a Chatbot

• Features
  ▪ Handles Same Services As Live Chat Service
  ▪ Leverage Natural Language Processing
    o Emulate Human-to-Human Interaction
    o Redirect Complex Requests to Customer Service Reps
  ▪ Support Short Message Service (SMS) and iMessage
  ▪ Integrate with Other MSUFCU Services
    o Website
    o Mobile App
    o Amazon’s Alexa
  ▪ Provide Web-Based Content Management System

• Technologies
  ▪ Amazon Echo
  ▪ Alexa Skills Kit
  ▪ CSS / HTML5 / PHP / JavaScript
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ MySQL
  ▪ Short Message Service (SMS) and Apple’s iMessage
  ▪ Encryption based on SQL standards
  ▪ Natural Language Processing (NLP)
Team Phoenix Group

Project Overview

OPEN v2.0: Smart Order Picking

- Functionalities
  - Enhance Warehouse Order Picking Process
  - Using Bluetooth Low-Energy Devices
- Features
  - Create Windows Tablet-Based Pick Ticket
  - Display Geolocation-Based Warehouse Map
  - Provide Bin Locations and Route Planning
  - Support Real-Time Shelf Counts
  - Handle Bar Codes
- Technologies
  - Microsoft Windows Presentation Foundation (WPF)
  - Microsoft .NET Framework
  - Microsoft C#
  - Microsoft Visual Studio 2015
  - Bluetooth Low Energy Devices
  - MySQL Server
  - Bar Code Scanning Technologies
Team Rook

Project Overview

Cloud Security Event Processing and Alerting Platform

• Functionalities
  ▪ Analyze Cyber Security Events
  ▪ Using a Serverless Architecture
  ▪ That Scales to Millions of Events Per Day

• Features
  ▪ Design and Build a Web App
  ▪ Support Management of Correlation Rules
    o Edit Exiting Rules
    o Examine Performance of New Rules
  ▪ Detect and Notify When Alerts or Rules Triggered
  ▪ Accommodate Increasing Scale Using Amazon Cloud
  ▪ Integrate with Rook’s Force Platform

• Technologies
  ▪ Amazon Athena
  ▪ Amazon Simple Email Services (SES)
  ▪ Amazon Lambda
  ▪ Amazon S3
  ▪ Elasticsearch
  ▪ Ubuntu 16.04
  ▪ Python / Django
  ▪ CSS / HTML / JavaScript / JSON
  ▪ RESTful Web Services
Team Spectrum Health

Project Overview

Spectrum Health Symptom Checker

- Functionalities
  - Recommend Spectrum Health Services to Patients
  - Based on Symptoms They Provide
- Features
  - Design and Build Web and Mobile Apps
  - Match Keywords with Symptoms
  - Recommend Health Service
    - eVisit
    - Urgent Care
    - Emergency Room
  - Enable Urgent Care Visit
    - Give Nearest Location
    - Reserve Place in Line
  - Leverage Machine Learning
  - Provide Administrative App
- Technologies
  - CSS / HTML / JavaScript / PHP
  - Apple iPads and iPhones (iOS) / Swift
  - Google Android Tablets and Phones / Java
  - Microsoft C# / .NET
  - Entity Framework Core
  - Microsoft SQL Server
Team Symantec

Project Overview

Secure Application Layer API Proxy

• Functionalities
  ▪ Provide RESTful API to Symantec’s Multi-Factor System VIP
  ▪ Via a Proxy Layer in Front of Native SOAP Layer
  ▪ So Any RESTful Framework Can Integrate with VIP

• Features
  ▪ Focus on User Centric Services
    o Management APIs
    o Authentication APIs
    o Query APIs
  ▪ Preserve Parity Between SOAP and REST APIs
  ▪ Implement a Versioning Scheme
  ▪ Include “Jurisdiction Hash” (JHASH) as Path Parameter
  ▪ Deliver Integration Tests

• Technologies
  ▪ Symantec VIP and VIP Access Manager.
  ▪ Simple Object Access Protocol (SOAP) Web Services
  ▪ Representational State Transfer (REST) Web Services
  ▪ StrongLoop / Node.js
Team TechSmith

Project Overview

TechSmith Director

• Functionalities
  ▪ Explore Creating Video Scenes
  ▪ With a User Friendly Voice Input Interface
  ▪ Using Newer Cloud-Bases APIs

• Features
  ▪ Design and Build a Web App
  ▪ Support Natural Language Voice Input
    o “I’d like a beach background for my video.”
    o “Let’s place a man on the beach.”
    o “I’d like the man to walk along the beach.”
  ▪ Leverage Microsoft Azure Cloud Computing
    o Store User and Project Information
    o Process Utterances (Voice Input)
    o Implement Speech to Text
    o Apply Natural Language Processing
  ▪ Send Projects to Other Users for Feedback

• Technologies
  ▪ Microsoft Azure Cloud Computing
  ▪ Bing Image Search
  ▪ SoundCloud API (For Music)
  ▪ CSS / HTML / JavaScript
  ▪ ASP.Net MVC or Node.js
  ▪ Natural Language Processing (NLP)
  ▪ SQL Database
Team TWO MEN AND A TRUCK

Project Overview

Online Moving Estimator

• Functionalities
  ▪ Provide In-Home Moving Estimate
  ▪ Online Using Web App

• Features
  ▪ Design and Build Web App
  ▪ Provide Chat and Video Conference
  ▪ Determine Room Inventory
    o From Video
    o Automatically
  ▪ Estimate Moving Cost
    o Compute Load / Weight / Space on Truck
    o Use TMaaT Existing Algorithm
  ▪ Integrate with Existing Quick Estimate Module

• Technologies
  ▪ CSS / HTML / JavaScript / PHP
  ▪ Video Conferencing
  ▪ Image Processing and Pattern Recognition
Team Union Pacific

Project Overview

RailBuilder: The Great Race to Promontory

- Functionalities
  - Create Railroad Building Game
  - In 3D Representation of the World

- Features
  - Support Creation of Game Levels
    - Deploy as Microsoft Windows App
    - Include Topology and Land Classification
    - Place Scenery in Realistic Fashion
    - Use Terrain Grade and Elevation
  - Create Railroad Building Game
    - Between Two Locations in 3D
    - Using Limited Budget
    - Factoring Topology and Land Classification
    - Removing Scenery Where Rail is Laid

- Technologies
  - Unity Game Engine
  - Microsoft Windows
  - Microsoft C# / .NET
  - Apple iPads and iPhones (iOS) / Swift
  - Google Android Tablets and Phones / Java
  - ArcGIS Mapping Tools
Team Urban Science

Project Overview

KPI Recommendation and Action Application

• Functionalities
  ▪ Answer User Free-Form Speech Input Question
  ▪ By Correlating Question with Key Performance Indicators (KPIs)

• Features
  ▪ Design and Build Mobile App
  ▪ Visualize Selected KPIs
  ▪ Show Actions Associated with Each KPI
  ▪ Evaluate All Possible KPIs and Actions
  ▪ Determine Best Answer to Question

• Technologies
  ▪ Apple iPads and iPhones (iOS) / Swift
  ▪ Google Android Tablets and Phones / Java
  ▪ Microsoft .NET Core 1.0
  ▪ Microsoft Cognitive Services
    o Speech
    o Language
    o Knowledge
    o Search
Team Yello

Project Overview

Automatic Resume Verification

• Functionalities
  ▪ Verify Resume Information
  ▪ Automatically and Instantly

• Features
  ▪ Design and Build Two Web Apps
    o For Universities and Workplaces to Upload Credentials
    o For Candidates to Upload Resumes
  ▪ Ensure Security and Privacy
    o Proof of Source
    o Proof of Existence / Timestamp
    o Proof of Work / Education / Military Service
  ▪ Store and Access Credentials Using a Blockchain
  ▪ Notify Candidates When Credentials Uploaded
  ▪ Verify Resume Information Upon Uploading
  ▪ Inform Recruiters re Resume Accuracy

• Technologies
  ▪ Ruby on Rails
  ▪ Blockchain
  ▪ Transactional APIs
First Assignments

• Read the **Syllabus**.

• Check out the Lab (**3352 EB**).
  ▪ See if you can find it.
  ▪ See if you can get in.

• Check out the **Web Site**.

• Research your **Project**.
  ▪ Sponsor
  ▪ Technologies
What’s Next?

• Teams
  - Assignments by Email Tonight
  - Meet Initially by Tomorrow Afternoon
  - Lab Machine Assignments in Lab
  - Start Researching Technologies
  - Start Configuring Lab Machines
  - Team Photos
    - Wednesday, 09/07, After All-Hands Meeting
    - Dress Casual (But Appropriate)
    - Schedule for it.

• Client
  - Contact by Email by Tomorrow COB (Close of Business)
  - Conference Call or On-Site Meeting by Friday
  - Review Project Proposal
Capstone Overview

✓ Course Logistics

✓ Client Projects

➢ Course Logistics (Continued)
Urban Science Capstone Lab Machines

• Up to Four per Team
  ▪ Two 27” iMacs
  ▪ One Dell Rack-Mounted Server (Optional)
    o Connect to Outside World
    o Keep Secure
  ▪ One Mac Book Pro (Optional)

• Operating Systems on iMacs and MBPs
  ▪ Run macOS Sierra (High Sierra in ~ 2 Weeks?)
  ▪ Install VMware Fusion (from [here](#))
  ▪ Create Virtual Machines
    o Windows 10 VM from TAs
    o Others as Needed
  ▪ Don’t use Apple Boot Camp
Capstone Lab Miscellany

• Security
  ▪ Keep lab doors closed.
  ▪ Do not open doors for strangers
  ▪ Do not give out door key code to others.
  ▪ Do not invite non-capstone students to work in the lab with you.
  ▪ Email Dr. D. if door becomes unlocked.

• Wireless
  ▪ SSID: CSE498
  ▪ Key: ??????

• Coffee
  ▪ Some Provided by Dr. D.
  ▪ Bed, Bath & Beyond (Get 20% Off Coupon)

• Game Playing / Video Watching
  ▪ Not On Monitors Facing Hallway
  ▪ Not If Other Team Members Need Machine
Capstone Lab Miscellany

• Do not “maniac” the wires and cables.
• Keep the lab neat and clean.
  ▪ Lived In, Okay.
  ▪ Messy, Not Okay.
• Respect other teams’ spaces.
• Garbage Containers
  ▪ Empty the small one by the coffee maker into a larger one.
  ▪ Put larger ones out in the hall at night if near full.
  ▪ Put back in the lab in the morning if empty.
• Turn the lights out if you’re the last one out.
• Close the windows if you open them.
• Be careful with cabinet drawers; don’t “maniac” them.
Mobile Devices Available

• For Capstone Project Use
• By Team for the Semester
• iOS
  ▪ 5 iPads
  ▪ 1 iTouch
• Android
  ▪ 1 Tablet
  ▪ 1 Phone
• Surface Pro 3
Expectations & Workload

- Extremely High For Both
- Your MSU Career Capstone
- Addition to Your Personal Portfolio
- Experience Viewed Like an Internship
- Interview Talking Points
- Leverage Into a Job Offer
Schedules

• **Schedules > All-Hands Meeting**

• **Schedules > Major Milestones**
  - 09/13: Status Report Presentations
  - 09/18: Project Plan Presentations
  - 10/16: Alpha Presentations
  - 11/13: Beta Presentations
  - 12/04: Project Videos
  - 12/06: All Deliverables
  - 12/07: Design Day Setup
  - 12/08: Design Day

- Attendance is required.
- No excuses are accepted.
- Do not schedule anything including during these times interviews, travel home, etc.
- Will coordinate with your interviews.
Meeting Attendance

- **Required**
  - All-Hands (Class) Meetings
  - Team Triage Meetings
  - Team Meetings
  - Team Conference Call Meetings

- **5% of Final Grade**

- **Late == Absent**
  - 1% of Final Grade for Each Unexcused Absence
  - Attendance Grade Can Be Negative (See Syllabus)
  - If > 5 Absences Team Contribution Grade May Be Affected

- **Almost No Excuses Accepted**
  - One or Two Excused Possible for Interviews
  - Must Provide Information
    - Date, Company, Recruiter Name & Contact Info
    - In Advance
    - To Both Dr. D. and TAs

- **Must Attend (No Excuses Accepted)**
  - Your Team Presentations
  - All Project Video Viewing
  - Design Day

Note change in syllabus.

Do NOT schedule interviews.
Do NOT schedule ANYTHING.
Do NOT buy plane tickets.
Team Organization

• Up to Each Team
• Organize into Roles
  ▪ Client Contact
  ▪ Program Manager
  ▪ Developer
  ▪ Tester
  ▪ Systems Administrator
  ▪ Etc...
• Everyone must make technical contributions.
Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Address Problems Immediately
  - Within Team
  - With Dr. D. and/or TAs
- Be Ready to Discuss During Interviews
Grading

- **Team (70%)**
  - Project Plan Document & Presentation 10
  - Alpha Presentation 10
  - Beta Presentation 10
  - Project Video 10
  - Project Software & Documentation 25
  - Design Day 05
  - Total 70

- **Individual (30%)**
  - Technical Contribution 10
  - Team Contribution 10
  - Team Evaluation 05
  - Meeting Attendance 05
  - Total 30
Grading

• Final Grade Sum Of...
  ▪ Individual Total
  ▪ % of Team Total Based on Team Contribution

• Grand Total =
  (Individual Total)
  +
  (Team Total) * (Team Contribution) / 10.0

• Nota Bene: Your Team Contribution will have a very significant effect on your final grade.
## Effect of Team Contribution

<table>
<thead>
<tr>
<th>Technical Contribution</th>
<th>Team Contribution</th>
<th>Team Evaluation</th>
<th>Meeting Attendance</th>
<th>Team Total</th>
<th>Grand Total</th>
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*Nota Bene: Assumes Perfect Score In Every Other Category*
## Grading

### Fall 2016 Grade Distribution

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Grading

Unacceptable Excuses for Not Contributing

• They never asked me to do anything.
• They never let me do anything.
• I wrote 1000’s of lines of code but they weren’t included in the project.
• My features were not included in the project.
• I work 40 hours per week at my job.
• I live 60 minutes from MSU.
• I didn’t want to work on this project team.
• I ranked this project 20 out of 20.
• I did a lot of research about stuff we never used.
• Etc...
Grading

• We reserve the right to make changes with sufficient notice.
• No special consideration will be given for final grades including but not limited to:
  ▪ status in any academic program including CSE,
  ▪ financial aid,
  ▪ rank in the armed forces,
  ▪ job while a student at MSU,
  ▪ job after anticipated graduation from MSU,
  ▪ commute to MSU,
  ▪ graduation,
  ▪ mortgage,
  ▪ wedding,
  ▪ visa status,
  ▪ ability to enroll in CSE498 next semester,
  ▪ or anything else.
Integrity of Scholarship

• MSU’s policies will be enforced.

• Individual and team work must be original.

• Violators...
  ▪ ...will be referred to the appropriate deans.
  ▪ ...may receive a grade of F in the course.
Using Resources

• Ok For “Help”
  ▪ People
    o Past Capstone Teams
    o Other Capstone Teams
    o Faculty Members
  ▪ Articles
  ▪ Sample Code
  ▪ Etc...

• Not Ok For “ Entire” Project
• If Unsure, Ask Dr. D. and/or TAs
Using Existing Code

• Ok
  ▪ Examples
  ▪ Prototypes
  ▪ Open Source Code
    o Fragments
    o Libraries
    o Utilities

• Not Ok
  ▪ Vast Amounts of Your Project
  ▪ Not Open Source

• Ask Client in Advance
• Document and Report All Existing Code Used
• Be Careful!
• If Unsure, Ask Dr. D. and/or TAs and/or Your Client
Design Day

• College of Engineering Event
  ▪ Engineering Building
  ▪ Friday, December 8, 2017

• Displays (Booths) of Design Projects
  ▪ CSE Capstone
  ▪ ECE Capstone
  ▪ ME Capstone
  ▪ Etc...

• Presentations and Awards
  ▪ Panel of Judges
  ▪ CSE Team Project Videos
Travel to Client

• Reimburse for Mileage for Personal Car
• Travel Within Michigan (Outside of Lansing)
  ▪ Grand Rapids
  ▪ Metro Detroit
• From East Lansing to Client and Back
• One Car Per Team Per Trip
• See Brenda in the CSE office in advance.
VISA

• Verified Individualized Services and Accommodations

• Let us know immediately.

• We will work with you.
Office Hours

• Any Time...
  ▪ Visit: 3149 EB
  ▪ Call: 353-5573
  ▪ Email: (dyksen@msu.edu)

• Make Appointment
Capstone Overview

✓ Course Logistics

✓ Client Projects

✓ Course Logistics (Continued)

Questions?
What’s ahead?

• Team Photos
  ▪ Informal
    o After Meeting Today: Teams Amazon through Mozilla
    o After Meeting Wednesday: Teams MSUFCU through Yello
  ▪ Formal
    o Dress code for presenting teams is business casual.
    o After Each Project Plan Presentation

• Setup
  ▪ Team Machines
    o Dell Server If Needed (Ask TAs)
    o Apple iMacs
  ▪ Team Software
    o Microsoft Office
       Word and PowerPoint
       Microsoft Windows Version
    o Web Server
    o Code Repository
    o SDK’s
    o Etc.

Required.
Use Windows 10 VM.
What’s ahead?

All-Hands Meetings

• 08/30: Capstone Overview
• 09/04: (Labor Day, No Meeting)
• 09/06: Project Plan
• 09/11: Risks and Prototypes
• 09/13: Team Status Report Presentations
• 09/18: Team Project Plan Presentations
• 09/20: Team Project Plan Presentations
• 09/25: Team Project Plan Presentations
• 09/27: Team Project Plan Presentations
What’s ahead?

- Team Status Report Presentations
  - **PowerPoint Template**
  - Due 4:00 a.m., Wednesday, September 13
  - 1 Week
  - Email to Dr. D.
    - Subject: Team <Company Name>: Status Report
    - Subject: Team Auto-Owners: Status Report
    - Attachment: team-<company-name>-status-report-presentation.ppt
    - Attachment: team-urban-science-status-report-presentation.ppt

- Dr. D. Will Combine Into Single PowerPoint
  - To Speed Things Up During Meeting
  - Do NOT Modify Master Slide
  - Must Use Windows Version of Microsoft Office

- Each Team Presents
  - Using Dr. D.’s Laptop
  - At Most 4 Minutes (Rehearse Timing)
  - Single or Multiple Presenters (Your Choice)

Get on it, now!