

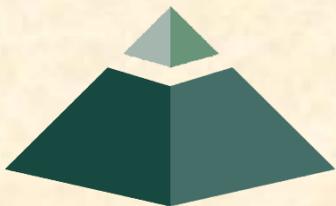
09/02: Capstone Overview

The Capstone Experience

Dr. Wayne Dyksen
James Mariani
Luke Sperling

Department of Computer Science and Engineering
Michigan State University

Fall 2020



*From Students...
...to Professionals*

CSE 498, Collaborative Design

- “The Capstone Experience”
- Instructors
 - Dr. Wayne Dyksen (“Dr. D.”)
 - James Mariani
 - Luke Sperling
- Class Meetings (aka All-Hands Meetings)
 - MoWe 10:20 – 11:40 a.m. Eastern Time
 - [Microsoft Teams General Channel](#)
- Website
 - capstone.cse.msu.edu
 - Check it often.
- Syllabus
 - www.capstone.cse.msu.edu/other-links/syllabus
 - Read it thoroughly and carefully.
- Email
 - Check your email often.
 - Read my email immediately, thoroughly and carefully.



About Us

- Dr. D.
 - Hometown: North Haledon, New Jersey
 - Education: Calvin College (BS), Purdue University (MS, PhD)
 - Experience: Professor @ Calvin, Purdue, Nebraska, MSU
- James Mariani
 - Hometown: Sterling Heights, Michigan
 - Education: MSU (BS, MS, PhD Candidate)
- Luke Sperling
 - Hometown: Birmingham, Michigan
 - Education: MSU (BS, MS, PhD Candidate)



Professional Meeting Expectations

- Starts at 10:20 a.m. EDT Promptly
 - Joined the Microsoft Teams Meeting
 - Ready to Go
 - Microphone Muted
 - Video On
 - Looking Professional
- No...
 - Other Electronic Devices
 - Hats or Hoods
 - Coats
 - Eating
 - Sleeping
 - “Breaks”
- Questions? (How to...)



Capstone Overview

➤ Course Logistics

- Client Projects
- Course Logistics (Continued Next Meeting)

Microsoft Teams Attendance

- Download Attendees List
 - Who
 - When Joined
- Google Form
 - Random Times
 - 1 Minute To Respond
 - No Response?
 - Left Meeting
 - Absent



Course Goals

[1 of 3]

- Give You Experience In
 - Real World
 - Corporate Setting
- Start Your Transition
 - From Student...
 - ...To Professional
- Start Your Transition
 - From... “Make one of these.” –CSE Professor
 - ...To “Solve my problem.” –Customer/Client



Course Goals

[2 of 3]

- Teams of Students
- Build Significant Software System
 - Design
 - Develop
 - Debug
 - Document
 - Deliver
- For Project Sponsor / Client
(Note: We'll use “project sponsor” and “client” interchangeably.)
- In 15 (Short) Weeks



Course Goals

[3 of 3]

- Build a significant software system.
- Work in a team environment.
- Learn to work in a remote environment.
- Learn new tools and environments.
- Build and administer systems.
- Develop communication skills.
- Develop interview talking points.
- Learn to do stuff on your own.
- Etc...



Project Deliverables

- Project Plan Presentation & Document
- Alpha Presentation
- Beta Presentation
- Project Software
- Project Video
- Design Day

See [Major Milestones](#).



All-Hands Meetings

Presentations By

- Dr. D.
- TAs
- Teams
 - Status Reports
 - Formal Presentations (30% of Final Grade)
 - Project Plan
 - Alpha
 - Beta
 - Project Videos
- Guest Speaker(s)

All-Hands Meetings Agendas

- 09/02: Capstone Overview
- 09/07: (US Labor Day, No Meeting)
- 09/09: Capstone Overview
- 09/14: Project Plan
- 09/16: Team [Status Report Presentations](#)
- 09/21: Risks and Prototypes
- 09/23: Team Status Report Presentations
- 09/28: Team [Project Plan Presentations](#)
- 09/30: Team [Project Plan Presentations](#)
- 10/05: Team [Project Plan Presentations](#)
- 10/07: Team [Project Plan Presentations](#)
- 10/12: Creating and Giving Presentations
- 10/14: Team Status Report Presentations
- 10/19: Team [Alpha Presentations](#)
- 10/21: Team [Alpha Presentations](#)
- 10/26: [Alpha Presentations](#)
- 10/28: [Alpha Presentations](#)
- 11/02: [Design Day](#) and the Project Videos
- 11/04: Camtasia Demo
- 11/09: Intellectual Property
- 11/11: Ethics and Professionalism
- 11/16: Team [Beta Presentations](#)
- 11/18: Team [Beta Presentations](#)
- 11/23: Team [Beta Presentations](#)
- 11/25: Team [Beta Presentations](#)
- 11/30: Team Status Report Presentations
- 12/02: Team Status Report Presentations
- 12/07: Project Videos
- 12/09: Project Videos and All Deliverables
- 12/11: Design Day
- 12/18: Capstone Wrap-Up
7:45 a.m — 9:45 a.m. ET



Schedules

- Schedules > All-Hands Meeting

- Schedules > Major Milestones

- 09/16: Status Report Presentations

- 09/28: Project Plan Presentations

- 10/19: Alpha Presentations

- 11/16: Beta Presentations

- 12/07: Project Videos

- 12/09: All Deliverables

- 12/11: Design Day

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



The Capstone Labs

- [3322EB](#), [3340EB](#), [3352EB](#), [3358EB](#)
- 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)
 - Team 100% Responsible
 - Building
 - Maintaining
 - Securing
 - Backing Up
- Books
- WiFi
 - SSID: CSE498, CSE498 5MHz
 - Key: ????????
- Conference Room ([3322EB](#))
 - 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 Dr. D. 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.
 - Team Meetings
 - Triage Meetings
 - Client Conference Calls



CSE498 Prerequisites

Must Have Successfully Completed

- Tier I Writing Requirement
- CSE335
- CSE325 or CSE410
- Two CSE Technical 4xx Courses
- Ability to Read Email
 - Immediately
 - Carefully
 - Completely



Integrity of Scholarship

- MSU's policies will be enforced.
- Individual and teamwork must be original.
- Providing false information to the professor, teaching assistants or fellow team members about matters related to the course will be considered academic dishonesty.
- Violators...
 - ...will be referred to the appropriate deans.
 - ...will receive a grade of F (0.0) in the course.



Capstone Overview

✓ Course Logistics

➤ Client Projects

• Course Logistics (Continued)



Team / Project Generalities

[1 of 3]

- Clients
 - Vary in Size and Type
 - Client/mentor contacts are “volunteers.”
- Team Contact Person
 - Picked By Team
 - Main Point of Contact for Client



Team / Project Generalities

[2 of 3]

- 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

[3 of 3]

- Challenges
 - Very Short, Unforgiving Timeline
 - Client Contact
 - Team Dynamics
 - Project Plan (in ~3 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
 - Hard Enough
 - Not too Hard
 - 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

1. Amazon
2. AppDynamics
3. Atomic Object
4. Auto-Owners
5. Bedrock Detroit
6. Bosch
7. Dow
8. Evolutio
9. Ford
10. GM
11. Google
12. Herman Miller
13. Humana
14. Learning A-Z
15. Lockheed Martin Space
16. Malleable Minds
17. Meijer
18. Michigan State University ITS
19. Microsoft
20. Mozilla
21. MSUFCU
22. Proofpoint
23. Quicken Loans
24. TechSmith
25. United Airlines Airport Operations
26. United Airlines Digital Technology
27. United Airlines Training
28. Urban Science
29. Vectorform
30. Volkswagen



Team Amazon

Project Overview

Maestro

- Functionalities
 - Simplify Product Information Aggregation
 - With Automated Tool for Amazon Sellers
 - Help Improve Satisfaction
- Features
 - Analyze Product Details Across Internet
 - Determine Highest Quality Data
 - Ensure Every Listing has the Best Data
- Technologies
 - Machine Learning
 - Natural Language Processing
 - AWS Lambda
 - AWS Storage Technologies
 - Big Data Processing

FEATURES	PRODUCT NAME 1	PRODUCT NAME 2	PRODUCT NAME 3	PRODUCT NAME 4	PRODUCT NAME 5	PRODUCT NAME 6
PRICE	FREE	\$25-\$30	\$45-\$60	\$199	FREE	\$500
Unicode ✓ or ✗ symbols	✓	✗	✓		✗	✓
Custom Icon Sets	○	☑	✖	☑		✖
Up / Down Arrow Icons	▼	▬	▲		▼	▲
Check / X Icons	☒	⚠	✓	✓		✓
Flag Icons	🚩	🚩	🚩	🚩	🚩	
Ratings						
Unicode ★ symbol	★★★★	★	★★	★★★		★★★★★
Diamond ◆ symbol	◆	◆◆	◆◆◆	◆◆	◆	◆◆◆
Icon Set: Star (0,1,2)	☆	☆☆	☆☆	☆☆		☆☆
Icon Set: Quarter Circle (0,1,2,3,4)	○	◐	◑	◒	○	◐
Icon Set: Boxes (0,1,2,3,4)	☐	☐	☐	☐		☐
Icon Set: Bars (0,1,2,3,4)	▮	▮	▮	▮	▮	▮
Numeric & Text Specifications						
Data Bars	30	25	15	25	5	90
Custom number formats	128 GB	64 GB	256 GB	512 GB	32 GB	1024 GB
Basic Numeric Entry	4.23	1.23	5	6.2	1.54	3.52
Yes / No / na	No	Yes	No	Yes	na	Yes
Numbers with Different Units	2.3 TB	470 GB	125 GB	64 GB	512 MB	128 GB



Seattle, Washington
Detroit, Michigan

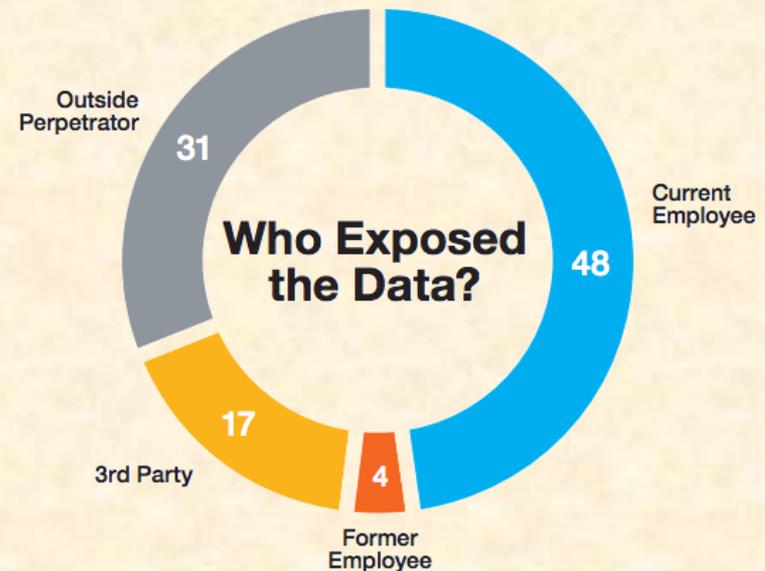


Team AppDynamics

Project Overview

Insider Threat Detection

- Functionalities
 - Detect Potential Data Breaches
 - Analyze Metrics for Determining Threats
 - Spot Anomalous Patterns
- Features
 - Offer Dashboards to Give Visibility into Threats
 - Manage Potential Data Breaches
 - Make Detected Threats Actionable
- Technologies
 - Web Stack for Visibility Dashboards
 - Backend
 - AppDynamics Software



Team Atomic Object

Project Overview

Plant Capacity Tracking Tool

- Functionalities
 - Build Robust Capacity Planning Tool
 - Help Manage Project Teams
 - With a Web-based Interface
- Features
 - Visualize Workforce Allocation
 - Easily Schedule Employees
 - Allow Offline Access and Editing
- Technologies
 - Modern JavaScript Framework
 - Node-Based Server-side Framework
 - Relational Database



ATOMIC OBJECT

Grand Rapids, Michigan



Team Auto-Owners

Project Overview

“Cover Your Assets”: A Risk Management Adventure RPG

- Functionalities
 - Simulate Living a Life to Learn
 - With a Single-Player RPG
 - Using Machine Learning for Scene Generation
- Features
 - Teach Insurance and Risk Management
 - Limitless Randomized Gameplay
 - Offer Multiple Difficulty Modes
 - Log all Gameplay for Analysis
- Technologies
 - SQL
 - Python
 - Unity / Unreal Engine



Auto-Owners
INSURANCE

LIFE • HOME • CAR • BUSINESS

Lansing, Michigan



Team Bedrock Detroit

Project Overview

Shared Parking Access

- Functionalities
 - Build Product to Help Facilitate Work-from-home
 - Optimize a Rotating In-Office Schedule
 - Increase Employee Satisfaction
- Features
 - Import New Team Members from CSV File
 - Determine Appropriate Parking Locations
 - Provide Web Application for All Types of Employees
 - Handle Large Amounts of Employees
- Technologies
 - ASP.NET MVC Web Application Framework
 - Amazon Web Services
 - HTML
 - JavaScript
 - SQL
 - AJAX

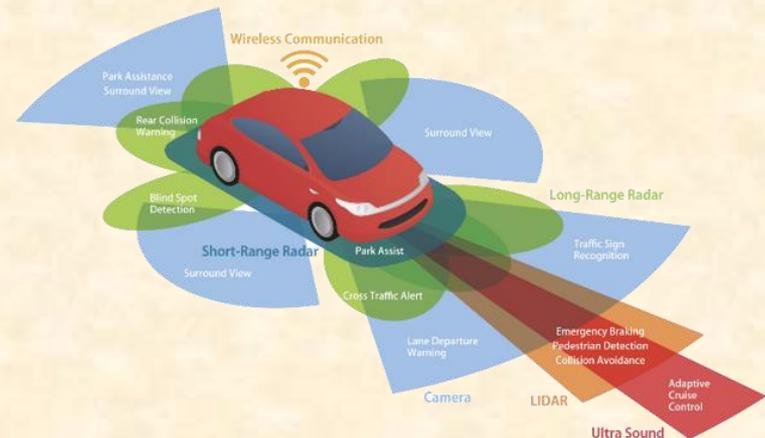


Team Bosch

Project Overview

Automated Retrieval of ADAS Driving Environments

- Functionalities
 - Classify Driving Environments for ADAS (Advanced Driver Assistance Systems)
 - Automate Labeling Process
 - Using Machine Learning
- Features
 - Search Through Videos for Different Environments
 - Manage Many Useful Tags
 - Handle Large Amounts of Data
 - Web Interface
 - Introduce New Tags
 - Easily Find Videos with Specified Tag
- Technologies
 - Python
 - HTML / CSS / JavaScript
 - Theano



BOSCH

Invented for life

Plymouth, Michigan

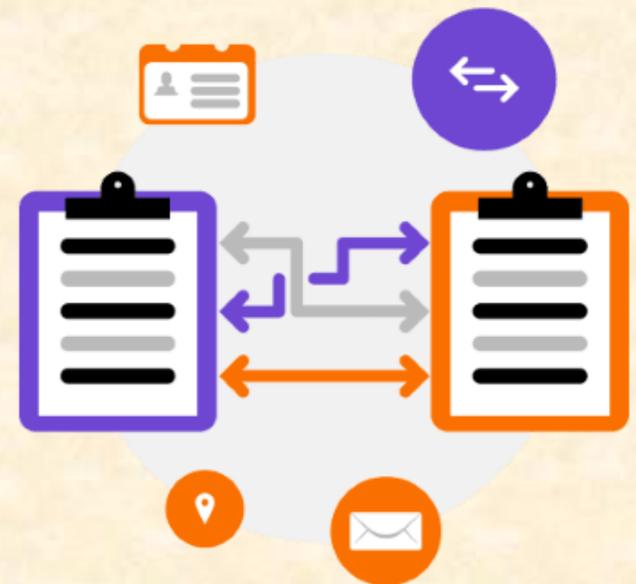


Team Dow

Project Overview

Artificial Intelligence Project Matcher

- Functionalities
 - Match People to Projects and Projects to People
 - Using Artificial Intelligence
- Features
 - Recommend Projects to Individuals for them to Browse
 - Recommend Individuals to Project Teams
 - Generate Recommendations
 - From Individual's Skillsets
 - And a Project's Needs
- Technologies
 - Microsoft Azure
 - Node.JS / React Native



Midland, Michigan



Team Evolutio

Project Overview

#BIKES4ERP Tracking Initiative

- Functionalities
 - Build Bike Tracking App
 - Anticipate Bike Maintenance
 - For Rural South African Students
- Features
 - Monitor Individual Bike Activities
 - Predict Repairs and Part Orders
 - Offer Functionalities with Little Connectivity
- Technologies
 - Near-Field Communication (NFC)
 - Android (Java / Kotlin)
 - ERP Dashboard on Browser



Team Ford

Project Overview

Ford Accelerate Monitor

- Functionalities
 - Build a Web Portal for Development Teams
 - Allow Commit, Deploy, Incident Creation, Rollback Events
 - Run Commands through a Smart Home Device
- Features
 - Coordinate with Team via Web Portal
 - Smart Home Device Notifications
 - And Question Answering
 - Receive Updates
 - From Jenkins Pipeline
 - On Incidents Created by Teams
- Technologies
 - GitHub APIs
 - Jenkins Remote Access API
 - RESTful APIs

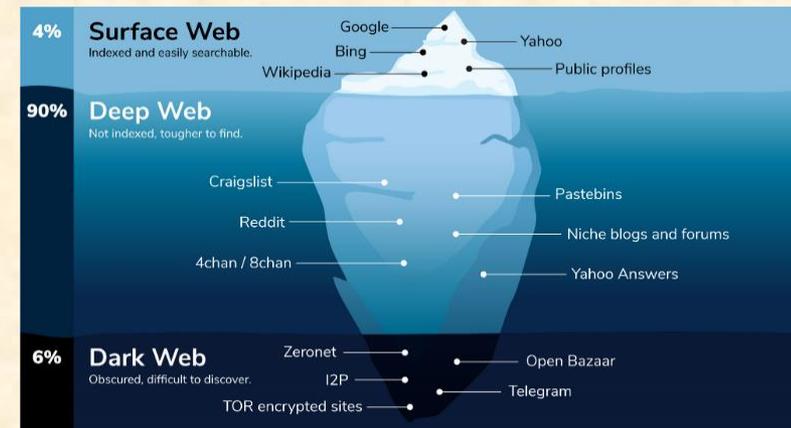


Team GM

Project Overview

Automotive Specific Dark Web Threat Intelligence

- Functionalities
 - Design Tool To Detect Automotive Threats
 - On the Dark Web
 - With Automated Data Collection
- Features
 - Personas to Interact with Forums
 - Regular Expression Matching
 - Access, Manage, and Catalogue Dark Web Threats
- Technologies
 - Python
 - JavaScript
 - ELK (ElasticSearch / LogStash / Kibana)



Team Google

Project Overview

Self-Service Support Chatbot for Google Cloud

- Functionalities
 - Build Chatbot for GCP Customers
 - Facilitate Bug Resolution
 - With Little Human Interaction
- Features
 - Automatically Aggregate System Logs
 - Build Appropriate Troubleshooting Trees
 - Build Model to Identify Relevant Resources
 - Submit New Support Cases
- Technologies
 - GCP AI Platform
 - GCP Natural Language
 - GCP Dialogflow



Google Cloud Platform



Hi, how can I help?



Kirkland, Washington
Mountain View, California

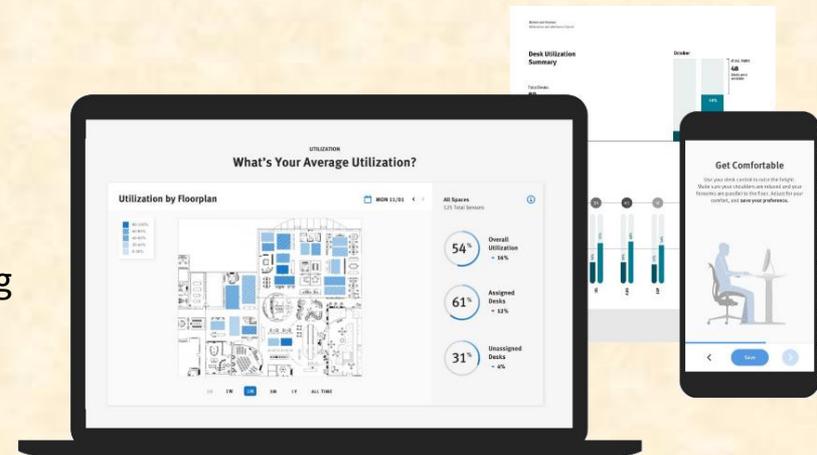


Team Herman Miller

Project Overview

Live Platform Real-Time Occupancy Status

- Functionalities
 - Find Underutilized Workspaces
 - Identify Seating Strategies
 - For Clients of Herman Miller
- Features
 - Visualize Collected Data and Show Trends
 - Build off Existing Dashboard Website
 - Operate in Real-Time for Occupancy Reporting
- Technologies
 - Amazon Web Service
 - HTML / CSS / JS
 - MySQL / Aurora
 - Mapbox GL JS



Team Humana

Project Overview

Internship Success App

- Functionalities
 - Guide Interns toward Success in their Internship
 - Facilitate Communication between Interns and Staff
- Features
 - Organize and Share Internship Information
 - Track Intern's Goals and Progress Toward Them
 - Hub for Providing Feedback
 - And Interacting with Mentors and Associates
 - Offer UI that Follows Humana Branding Standards
- Technologies
 - iOS / Android OS
 - Visual Studio Code
 - React Native
 - MySQL



Humana

Louisville, Kentucky

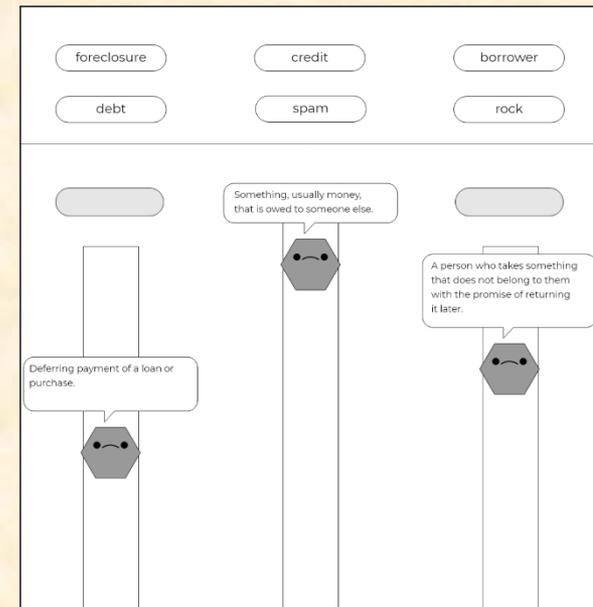


Team Learning A-Z

Project Overview

Vocab Slinger Word Definition Game

- Functionalities
 - Teach Children Vocabulary and Definitions
 - With an Educational Web Game
 - Where Words are Matched with Meanings by User
- Features
 - Offer Multiple Difficulty Modes
 - Rewards Application Currency upon Victory
 - Obtain Words and Definitions without Repetition
 - Host From Database Backend
- Technologies
 - Angular JS
 - PHP
 - MySQL

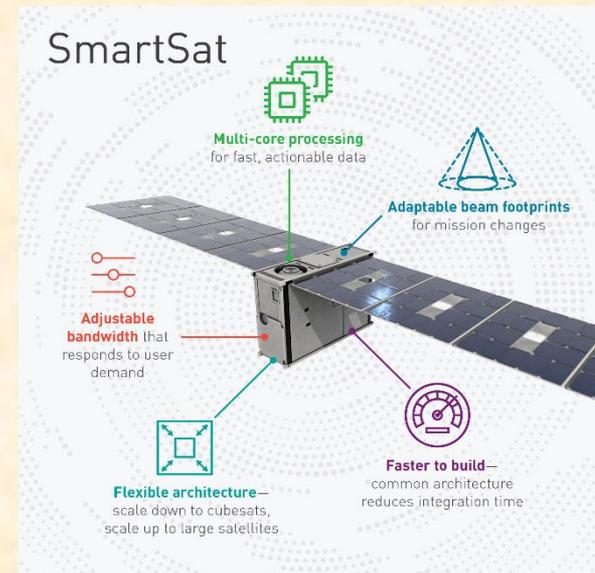


Team Lockheed Martin Space

Project Overview

SmartSat™ Heterogenous Computing in Space

- Functionalities
 - Extend Heterogeneous Compute Capabilities
 - And Simplify Utilization of FPGAs
 - On SmartSat Satellites and Ground Stations
- Features
 - Enable Rapid Software Development
 - That Utilizes Common Infrastructure
 - Allow Collaboration Between Ground and Satellites
 - Integrate Diverse Set of Computer Devices
- Technologies
 - C++ / Python / Machine Learning Frameworks
 - Embedded Development (Yocto)
 - Parallel Programming Languages (SYCL / ComputeCpp / Vitis)



Team Malleable Minds

Project Overview

Review Aggregator for Educational Programs

- Functionalities
 - Develop a Review Aggregator
 - For Educational Programs
 - With a Newly-Designed Database
- Features
 - Users Can Submit Reviews
 - Users Following Other Users
 - Provide Bookmarking/Favoriting System
 - Upload and Storage of K-12 Educational Programs
 - Robust Search Functionality
 - Secure User Registration System
- Technologies
 - Python
 - React / JS
 - Okta
 - Elasticsearch
 - Flask

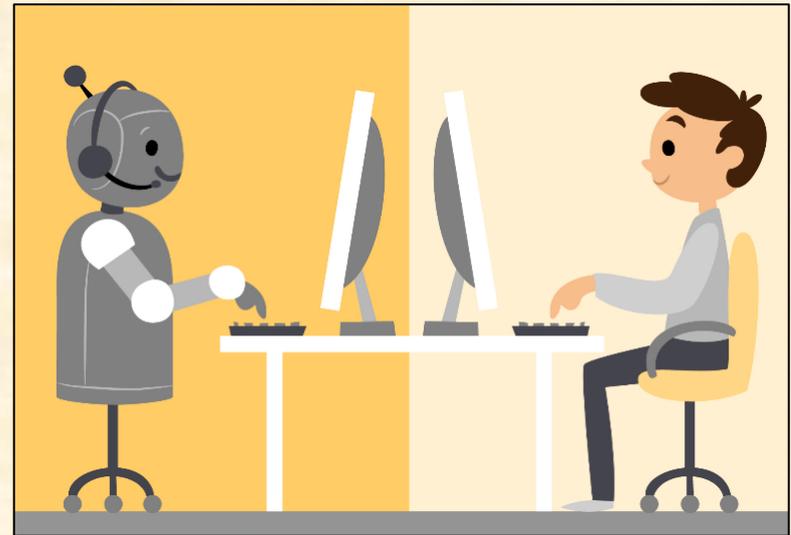


Team Meijer

Project Overview

Support Desk Chatbot

- Functionalities
 - Build Chatbot for Meijer Employees
 - That Need Tech Assistance
 - With Little Human Interaction
- Features
 - Allow Text or Voice Only Interaction
 - Mine Incident Ticket Data
 - Provide Biggest Impact
 - Machine Learning Used For Issue Resolution
 - Auto-Generate Incident Tickets
- Technologies
 - Microsoft Azure DevOps
 - Microsoft Azure Bot Framework
 - Microsoft Azure Cognitive Services



meijer[®]

Grand Rapids, Michigan

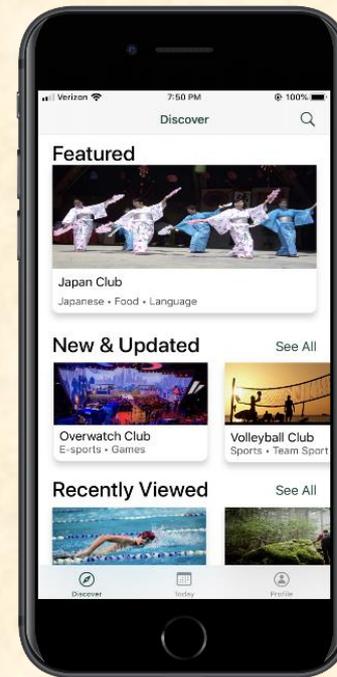


Team Michigan State University ITS

Project Overview

Explore: Discover Events and Experiences

- Functionalities
 - Organize MSU Campus Event Information into a Readable Format
 - With a Mobile Application
 - Focus on End-User Experience
- Features
 - Search and View Campus Events
 - Highlight a Variety of Events
 - In-Person
 - Online
 - Sports
 - Lectures
 - Show Parking Options with Costs
 - RSVP to Events
- Technologies
 - Amazon Web Services
 - iOS / Swift
 - Android / Kotlin
 - VueJS / React / Angular

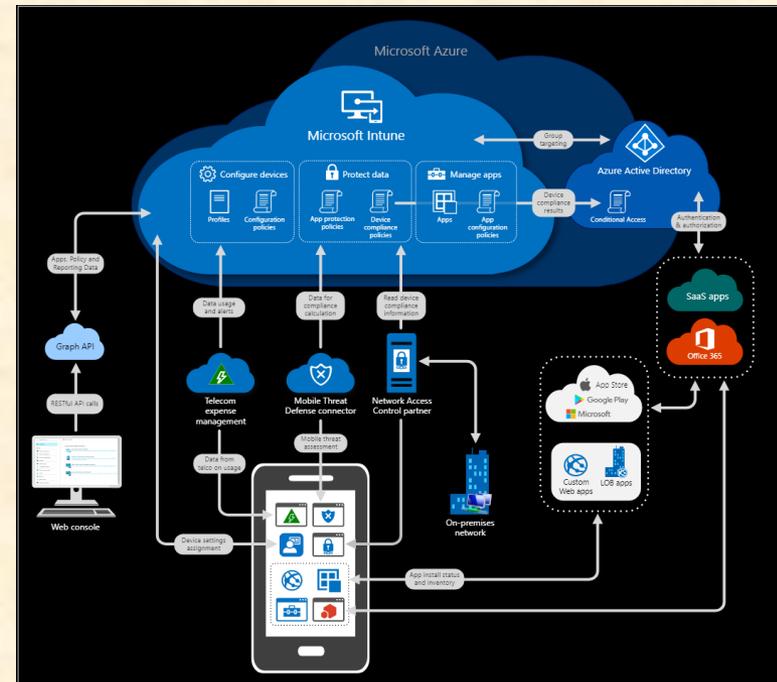


Team Microsoft

Project Overview

Feedback Analysis Hub for Microsoft Intune

- Functionalities
 - Build Microsoft Intune Review Hub
 - That Aggregates Reviews
 - From In-App and Public Sites
- Features
 - Gather and Analyze Intune Feedback
 - From Public Sites, Reddit or Twitter
 - Display Useful Metrics for Developers
 - Review and Act on Feedback
- Technologies
 - Microsoft Azure Services
 - Microsoft Graph
 - PowerBI

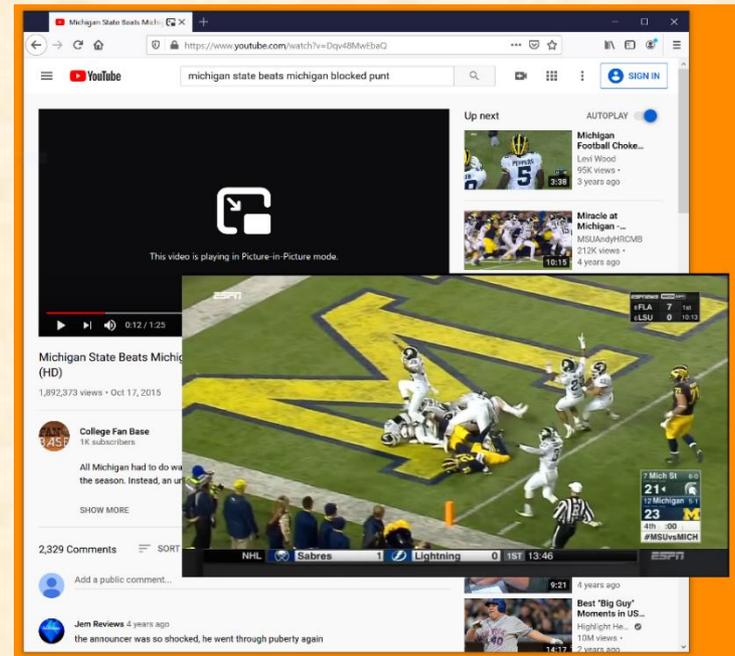


Team Mozilla

Project Overview

Making Firefox's Picture-in-Picture Even More Awesome

- Functionalities
 - Expand Firefox's Picture-in-Picture (PiP)
 - Allow Greater User Controls
 - And New Functionalities
- Features
 - Allow Multiple PiP Windows
 - Improve Control Locations of PiP UI
 - Improve Resizing and Snapping
 - Redesign Keyboard Access for PiP
- Technologies
 - JavaScript
 - HTML
 - C++
 - Mercurial
 - Phabricator
 - Windows / macOS / Linux



Nota Bene

- Team members are required to meet with the project sponsors all day on September 12 & 13 for an online weekend Firefox hackathon.
- Team Members must agree to Open Source licensing.



Mountain View, California

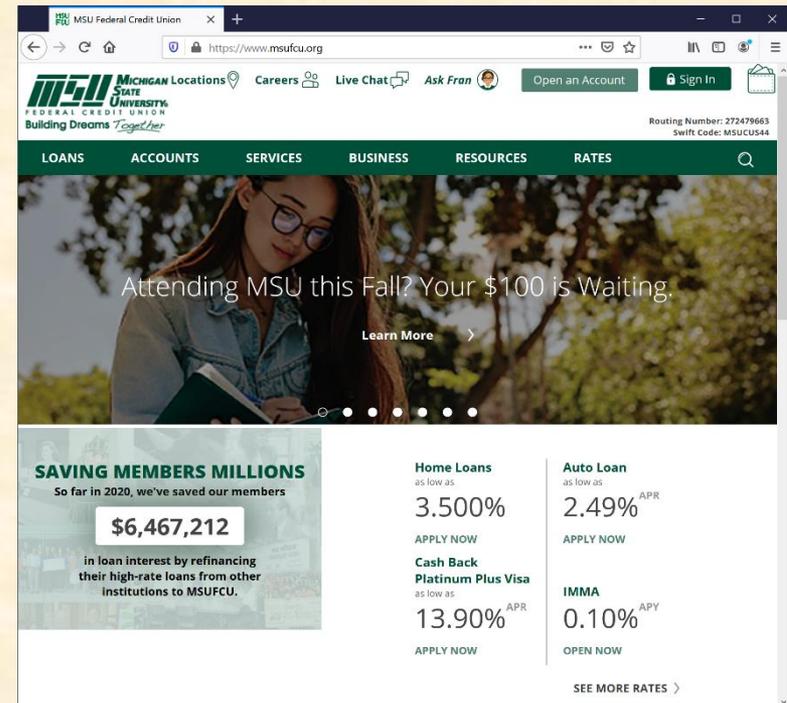


Team MSUFCU

Project Overview

Member Digital Help Center

- Functionalities
 - Build Help Center for MSUFCU Members
 - Help Members Navigate Web and App
 - Build a Better FAQ System
- Features
 - Develop Improved Search Functionality
 - Integrate MSUFCU's Existing Chatbot
 - House Video Tutorials and Documentation
- Technologies
 - HTML / CSS
 - PHP
 - JavaScript
 - Android (Java / Kotlin)
 - iOS (Objective-C / Swift)
 - MySQL



Team Quicken Loans

Project Overview

Rally OKR (Objectives and Key Results)

- Functionalities
 - Allow Teams to Create OKRs
 - In a Web Application
 - Provide Quick Search Results for OKRs
 - Track and Guide OKRs
- Features
 - Chat within the Site for Help and Bug Reporting
 - Integrate with Existing Employee Database
 - Interface with a Mobile Application
- Technologies
 - .NET Core
 - Angular / React
 - iOS / Swift
 - Android / Kotlin



Objectives

Where you'd like to go



Key Results

How you'll get there

Quicken Loans[®]
Engineered to **Amaze**[®]
Detroit, Michigan



Team TechSmith

Project Overview

TechSmith Video Summarizer

- Functionalities
 - Build Tool to Summarize Videos
 - Into Short, Easy-to-Read Articles
 - Help People Quickly Learn
- Features
 - Extract Text from Captions
 - Or Speech-to-text Methods
 - Analyze and Translate Text of Video
 - Summarize Pertinent Information
- Technologies
 - C# / .NET Core
 - Docker
 - Microsoft Azure
 - JavaScript / HTML

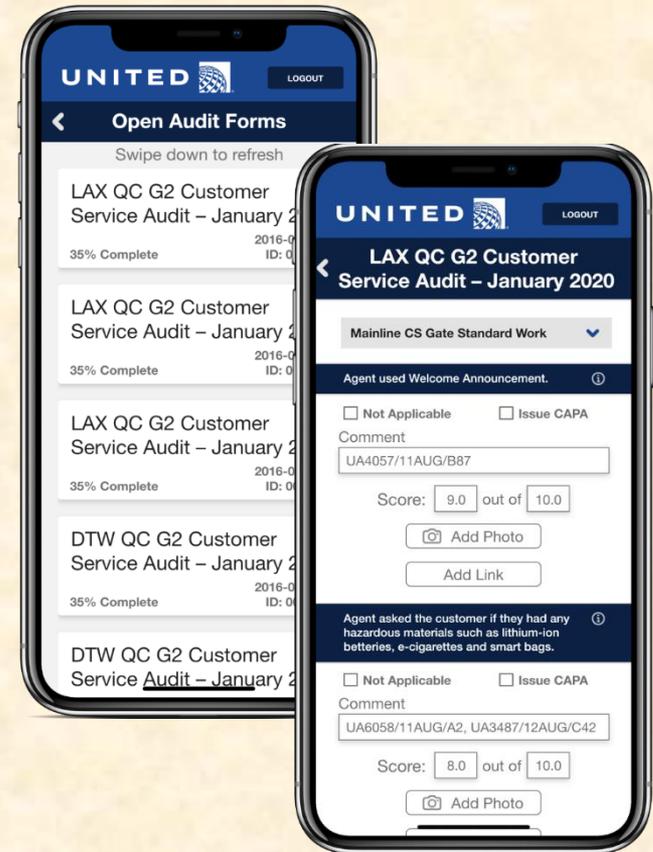


Team United Airlines Airport Operations

Project Overview

Mobile GSAP and QC Audit Center v2.0

- Functionalities
 - Submit Initial Reports of a Damage
 - In a Mobile Application
 - Conduct Peer-to-Peer Safety Audits
 - Conduct Safety and Compliance Audits
- Features
 - Build Off Previous Year's Capstone Project
 - Interface Mobile App with Database
 - Develop for Both Android and iOS
- Technologies
 - iOS
 - Android
 - SQL



Chicago, Illinois

Team United Airlines Digital Technology

Project Overview

Airport Lounge Management System

- Functionalities
 - In-depth Lounge Management System
 - Across Many Locations
 - Track and Manage Lounge Functions
- Features
 - Credential Lounge Entries
 - Interface with Existing Customer-Facing Applications
 - Build New APIs
- Technologies
 - Amazon Web Services
 - .NET
 - Progressive Web App
 - JavaScript



Team United Airlines Training

Project Overview

Tech Ops Training Content Management System

- Functionalities
 - Build System For Online Employee Training
 - Provide Accessible Training
 - Help Maintain Fleet of Aircraft
- Features
 - Develop Web Application
 - Manage all Media and Documentation
 - Provide Social Media/Chat Features
 - Implement Employee Tracking
- Technologies
 - Microsoft SQL Server
 - ASP .NET Core 3.1
 - Angular2
 - Node.JS
 - Oracle Access Manager (OAM)



Team Urban Science

Project Overview

Purchase Score Application

- Functionalities
 - Develop a Sales Lead Ranking Platform
 - Provide Metrics on Lead Quality
 - Increase Sales and Satisfaction
- Features
 - Allow Bulk Submission of New Leads
 - Develop Model to Rank Quality of Leads
 - Design Intuitive Dashboard to View Leads
- Technologies
 - C#
 - TypeScript
 - Angular
 - .NET Core
 - ASP .NET
 - Node.js



URBAN SCIENCE.

Detroit, Michigan



The Capstone Experience

Capstone Overview

Team Vectorform

Project Overview

Self-Improving Assistant

- Functionalities
 - Develop Chatbot and Voice Assistant
 - Provide Answers to Questions Quickly
 - Connect to Human as Fail-Safe
- Features
 - Train Chatbot on FAQ Database
 - And Support Call Transcripts
 - Use Natural Language Processing
 - Embed Chatbot in Microsoft Teams
- Technologies
 - Microsoft Teams
 - Microsoft Cognitive Services
 - C#
 - SQL
 - .NET



Team Volkswagen

Project Overview

VW Car-Net Electric Vehicle Route Planner

- Functionalities
 - Develop Route Planning Software
 - That visits EV Charging Stations
 - Better Advertise for EVs
- Features
 - Build Application Available at Dealers
 - User Can Input Two Locations
 - And Generate the Ideal Route
 - That Visits Charging Stations
 - Provide ETAs, Cost, Availability Info
- Technologies
 - TypeScript
 - Angular
 - Node.js
 - HTML



Google Form

- Open Browser
- Go to www.capstone.cse.msu.edu
- Click on...
 - + Other Links
 - > Downloads
 - Team Member Survey: [Google Form](#)



First Assignments

- Read the Syllabus.
- ~~Check out the Lab If So Desired (3322EB, 3340EB, 3352EB, 3358EB).~~
 - ~~See if you can find it.~~
 - ~~See if you can get in.~~
- Check out the Website.
- Research your Project.
 - Sponsor
 - Technologies



COVID Considerations

- Wear a mask.
 - In Public Places Including Campus
 - Cover your mouth and nose.
- Ensure social distancing.
- Wash your hands frequently.
- Carry and use hand sanitizer.
- Avoid “social gatherings.”
 - Any and All
 - Even 25 or Less People



What's Next?

- Teams
 - Receive assignments by email tonight. (Keep checking your email.)
 - Meet initially by tomorrow afternoon at the latest using Microsoft Teams private team channel.
 - Start researching technologies.
 - Start configuring lab machines.
 - Team assignments given in emailed project proposals.
 - TAs will email remote access instructions.
- Project Sponsor / Client Contact
 - Contact by email by tomorrow COB (Close of Business).
 - Complete conference call or online meeting by Friday.
 - Review project proposal.

Questions?



Capstone Overview

✓ Course Logistics

✓ Client Projects

➤ **Course Logistics (Continued)**



Where are we?

- Teams/Projects
 - Assigned
 - Met and Working
- Sponsors/Clients
 - Contacted
 - Met and Scheduled Weekly Meeting
- James and Luke
 - Heard From
 - Met and Scheduled Weekly Triage Meeting
- Capstone Lab
 - Successfully Connected Remotely
 - Began Configuring Systems
- Projects
 - Read Project Description
 - Discussed with Client
 - Began Exploring and Configuring Technologies
 - Began Exploring and Configuring Systems



Capstone Lab Machines

- Depends on Team Needs
 - Two 27" iMacs
 - ~~Dell Rack Mounted Server (Optional)~~
 - ~~Connected to Outside World~~
 - ~~Keep Secure~~
 - PC (Optional)
- Operating Systems on iMacs and MBPs
 - Run macOS Catalina 10.15.6
 - Install VMware Fusion (from [OnTheHub.com](https://www.onthehub.com))
 - Create Virtual Machines
 - Windows 10 VM from TAs
 - Allocate Sufficient Cores and Memory
 - Others as Needed
 - Don't use Apple Boot Camp
- Not Required to Use Capstone Lab Machines



Capstone Lab Miscellany

[1 of 3]

- ~~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. and TAs if door becomes unlocked.~~
- ~~Wireless~~
 - ~~SSID: CSE498~~
 - ~~Key: ???????~~
 - ~~Intended for Devices Requiring Lab Subnet~~
- ~~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

[2 of 3]

- ~~Do not “maniac” the wires and cables.~~
- ~~Keep the lab neat and clean.~~
 - ~~Lived In, Okay.~~
 - ~~Messy, Not Okay.~~
- ~~Respect...~~
 - ~~...other teams’ spaces.~~
 - ~~...shared 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.~~
- ~~Water Dispensers (Cooler and Fridge) are not connected to a drain.~~



Devices Available From MSU

- For Capstone Project Use
- By Team for the Semester
- Includes “General Purpose” Devices

- iOS

- iPads
- iPhones

If you need something, ask.

- Android

- Tablet
- Phone

We'll figure out how to get it to you.

- Surface Pro 3

- Oculus Rift

For starters, use emulators.

- Something Else

- How do you get them?

- Pick Them Up from Dr. D. or TA
- Ship Them to You



Devices From Project Sponsors

- Special Purpose Devices
 - NVIDIA Jetson
 - Drone
 - Raspberry Pi
 - Etc...
- How do we/you get the devices?
 - Ship to Dr. D.'s House? Pickup from Dr. D. and/or TA?
 - Ship Directly to You?
- Who gets the devices?
 - One or All of You?
 - Most Hardware-Smart Team Member?
- Where do we keep the devices?
 - Not in Capstone Lab
 - One of Your Apartments/Homes?
- How do we return the devices?
 - UPS, USPS,...
 - We will reimburse you if you have a receipt.



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

- 09/16: Status Report Presentations

- 09/28: Project Plan Presentations

- 10/19: Alpha Presentations

- 11/16: Beta Presentations

- 12/07: Project Videos

- 12/09: All Deliverables

- 12/11: Design Day

- 12/18: Capstone Wrap-Up

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



Meeting Attendance

[1 of 2]

- Required and On Time
 - All-Hands (Class) Meetings
 - Team Triage Meetings
 - Team Meetings
 - Team Conference Call Meetings
- Attendance How
 - Download Microsoft Teams Meeting Attendance at 10:25:00 a.m.
 - Who
 - When Joined the Meeting
 - Google Forms
 - 60 Seconds to Complete
 - One at Random Time During Meeting
 - One at End of Meeting
- Attendance Categories ← **Note Mistake in Email**
 - Join Time \leq 10:20:00 a.m. \Rightarrow Present
 - 10:20:01 a.m. \leq Join Time \leq 10:25:00 a.m. \Rightarrow Late
 - Join Time $>$ 10:25:00 a.m. \Rightarrow Absent
 - Miss Google Form \Rightarrow Left Meeting



Meeting Attendance

[2 of 2]

- Attendance Point Deductions
 - Absent \Rightarrow -1.0 Attendance Point
 - Late \Rightarrow -0.5 Attendance Point
 - Missed Google Form \Rightarrow Up to -5.0 Attendance Points
- Final Attendance Grade
 - Start with +5.0
 - 1.0 Attendance Point == 1.0% of Final Grade
 - Can Go Negative \leftarrow **Note**
- Almost No Excuses Accepted
 - One or Two Excused Possible for Interviews (No Travel Should Mean No Conflicts)
 - Must Provide Information
 - Date, Company, Recruiter Name & Contact Info
 - In Advance
 - To Both Dr. D. and TAs
- See Syllabus
 - All-Hands Meeting Attendance
 - Grading
- Must Attend (No Excuses Accepted)
 - Your Team Presentations
 - All Project Video Viewing
 - Design Day

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
 - Web
 - Mobile
 - Back End
 - Front End
 - Etc.
 - 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

[1 of 6]

- 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 (Can Be Negative) 05
 - Total 30



Grading

[2 of 6]

- 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.



Grading

[3 of 6]

Effect of Team Contribution					
Technical Contribution	Team Contribution	Team Evaluation	Meeting Attendance	Team Total	Grand Total
10	10	5	5	70	100
10	9	5	5	70	92
10	8	5	5	70	84
10	7	5	5	70	76
10	6	5	5	70	68
10	5	5	5	70	60
10	4	5	5	70	52
10	3	5	5	70	44
10	2	5	5	70	36
10	1	5	5	70	28
10	0	5	5	70	20

Nota Bene: Assumes Perfect Score In Every Other Category



- In the capstone course, absence does not make your teammates' hearts grow fonder.
 - Miss Meetings
 - All-Hands
 - Triage
 - Client
 - Team
 - Miss Work ← **Key**
 - ~~In Lab~~ and/or Online with Teammates
 - During Sprints
 - Before Major Milestones



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 30 out of 30.
- I did a lot of research about stuff we never used.
- I was busy interviewing.
- Etc...



Grading

[6 of 6]

- We reserve the right to make changes with sufficient notice.
- No special consideration will be given for final grades, including but not limited to
 - effect on GPA,
 - 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,
 - graduation,
 - mortgage,
 - wedding,
 - visa status,
 - effect on graduate school application,
 - or anything else.



Using Resources

- Ok For “Help”
 - People
 - Past Capstone Teams
 - Other Capstone Teams
 - 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
 - Fragments
 - Libraries
 - 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.



~~Travel to Client~~

- ~~• Reimburse for Mileage for Personal Car~~
- ~~• Travel Within Michigan (Outside of Lansing)~~
 - ~~▪ Grand Rapids~~
 - ~~▪ Midland~~
 - ~~▪ Metro Detroit~~
 - ~~▪ Zeeland~~
- ~~• 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.

Integrity of Scholarship

- MSU's policies will be enforced.
- Individual and teamwork must be original.
- Providing false information to the professor, teaching assistants or fellow team members about matters related to the course will be considered academic dishonesty.
- Violators...
 - ...will be referred to the appropriate deans.
 - ...will receive a grade of F (0.0) in the course.



Office Hours

- Any Time...
 - ~~Visit: 3149 EB~~
 - ~~Call: 353-5573~~
 - Email: (dyksen@msu.edu)
 - Message Using Microsoft Teams
- Make Appointment

Problems

- Address As Soon As Possible
 - Respectfully
 - Within Team
 - With TAs
 - With Dr D.



We don't have one of these.

Capstone Overview

✓ Course Logistics

✓ Client Projects

Questions?

✓ Course Logistics (Continued)



What's ahead?

[1 of 3]

- Team Photos
 - For Website and Design Day Booklet
 - Formal Team Photo.
 - Using Zoom (instead of Teams for Better Layout)
 - Screen Capture.
 - Dress is business casual.
 - TAs will make schedule.
- Setup
 - Team Machines
 - Dell Server If Needed (Ask TAs)
 - Apple iMacs (with Windows 10 VM)
 - Team Software
 - Microsoft Office
 - ❖ Word and PowerPoint
 - ❖ Microsoft Windows Version ← **Required. Use Windows 10 VM.**
 - Web Server
 - Code Repository
 - SDK's
 - Etc.



What's ahead?

[2 of 3]

- All-Hands Meetings
 - ~~09/02: Capstone Overview~~
 - ~~09/09: Capstone Overview~~
 - 09/14: Project Plan
 - 09/16: Team Status Report Presentations
 - 09/21: Risks and Prototypes
 - 09/23: Schedule and Teamwork
 - 09/28: Team Project Plan Presentations
 - 09/30: Team Project Plan Presentations
 - 10/05: Team Project Plan Presentations
 - 10/07: Team Project Plan Presentations



What's ahead?

[3 of 3]

- Team Status Report Presentations
 - [PowerPoint Template](#)
 - Due 11:59 p.m. ET, Tuesday, September 15 ← < 1 Week. Get on it now!
 - Email to Dr. D.
 - Subject: Team [Team Name]: Status Report Presentation
Subject: Team Auto-Owners: Status Report Presentation
 - Attachment: team-[team-name]-status-report-presentation.pptx
Attachment: team-urban-science-status-report-presentation.pptx
- Split All-Hands Meetings
 - Split by James' and Luke's Capstone Teams
 - Two Public Microsoft Teams Channels
 - James Teams
 - Luke Teams
- Dr. D. Will Combine Team Slide Decks into Two Slide Decks By TA
 - To Speed Things Up During Meeting
 - Do NOT Modify Master Slide
 - Must Use Windows Version of Microsoft Office
- Each Team Presents
 - TA Will Be Microsoft Teams Presenter
 - TA Will Share PowerPoint Slide Show (and "Drive")
 - At Most 4.5 Minutes (Rehearse Timing)
 - Single or Multiple Team Speakers (Your Choice)



09/16: Status Report Presentation

Team [Team Name]

The Capstone Experience

Dr. Wayne Dyksen

Department of Computer Science and Engineering
Michigan State University

Fall 2020



Status Report Instructions

- Use the Microsoft Windows version of PowerPoint.
- Required Template
 - Do not edit the master slides.
 - Do not change the organization or number of slides.
 - Make your presentation fit within these four slides.
- Content
 - For the slide titles, replace [Team Name] with your company name as in “Team Auto-Owners” and [Project Title] by the project title posted online.
 - All presentations will be posted on the course web site so do not include company confidential information or anything that your client would not want posted.
 - Delete this slide from the presentation.
- Presenting
 - The order of the presentations during our meeting will be team numerical order.
 - The time limit for your presentation is 4.5 minutes, which will be strictly enforced. Practice your presentation to ensure that you will finish within the allotted time.
- Submission by Email ← **Read this carefully.**
 - All presentations are due via email to me and to your client by 11:59 p.m., Tuesday, September 15. Send your presentation to your client in a separate email; do not cc me.
 - For subject, use “Team [Team Name]: Status Report Presentation” as in “Team Urban Science: Status Report Presentation”.
 - Attach the PowerPoint source file named “team-[team-name]-status-report-presentation.pptx” as in team-auto-owners-status-report-presentation.pptx. Use all lower case and replace blanks by dashes in your filename.
 - Include some (professional) text in the body to avoid being sent to my junk folder and to practice being a professional.



Team [Team Name]

Status Report

[1 of 4]

[Project Title]

- Project Overview

- Description Point 1
- Description Point 2
- Description Point 3
- Description Point 4

Status Information:

Think clicking “Status” on an Amazon order.

- You bought this on September 2. Helpful?
- We’re going to send this to you. Satisfied?
- People who bought this also bought.... We good?

What’s the \$*(%(\$*-ing status of my order?

Delete this textbox.

- Project Plan Document

- Status Point 1
- Status Point 2
- Status Point 3
- Status Point 4

Include status information.

What’s the status of your project plan document?

Have you started it?

How much have you written?

What percentage complete is it?

Delete this textbox and the brace to the left.



Team [Team Name]

Status Report

[2 of 4]

[Project Title]

- Server Systems / Software
 - Description &/or Status Point 1
 - Description &/or Status Point 2
 - Description &/or Status Point 3
- Development Systems / Software
 - Description &/or Status Point 1
 - Description &/or Status Point 2
 - Description &/or Status Point 3

Include status information.

Are all systems up and running?

Have you tested everything?

**Delete this textbox and the
brace to the left.**



Team [Team Name]

Status Report

[3 of 4]

[Project Title]

- Client Contact

- Status Point 1
- Status Point 2

- Team Meetings

- Status Point 1
- Status Point 2

- Team Organization

- Description Point 1
- Description Point 2

Include status information.

Have you talked with/met with your client?

Have you scheduled a weekly conference call? When?

Have you scheduled an in-person meeting? When?

How many times has your team met so far?

Have you scheduled team meetings? How often?

Delete this textbox and the brace to the left.

Include status information.

Who's doing what?

Delete this textbox and the brace to the left.



Team [Team Name]

Status Report

[4 of 4]

[Project Title]

Risks

- Risk 1
 - Description
 - Mitigation
- Risk 2
 - Description
 - Mitigation
- Risk 3
 - Description
 - Mitigation
- Risk 4
 - Description
 - Mitigation

List only “real” risks. For example, learning a new computer languages is **not** a risk for an MSU CSE student.

Give “useful” explanations of how you are going to mitigate each risk. For example, “we will learn how to do it” is **not** a useful explanation.

Delete this textbox.



COVID Considerations Reprise

- Wear a mask.
 - In Public Places Including Campus
 - Cover your mouth and nose.
- Ensure social distancing.
- Wash your hands frequently.
- Carry and use hand sanitizer.
- Avoid “social gatherings.”
 - Any and All
 - Even 25 or Less People

