

# 01/11,13: Capstone Overview

## The Capstone Experience

Dr. Wayne Dyksen  
James Mariani  
Luke Sperling  
Brenden Hein

Department of Computer Science and Engineering  
Michigan State University

Spring 2022



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

# CSE498, Collaborative Design

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



# Professional Meeting Expectations

- Starts at 10:20 a.m. ET (Eastern Time) 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...)



# COVID Considerations

[1 of 3]

- MSU On-Campus Requirements
  - Fully Vaccinated Including Booster
  - Indoors Wear Mask Covering Nose and Mouth
- Capstone Lab In-Person Use Requirements
  - Completed Vaccination Two Weeks Prior
  - Wear Mask Covering Nose and Mouth
  - Providing false information including about vaccination status will be considered a violation of MSU Integrity of Scholarship policy. See the syllabus for details.



# COVID Considerations

[2 of 3]

- Protect your health.
  - Get vaccinated and boosted.
  - Ensure social distancing.
  - Wash your hands frequently.
  - Carry and use hand sanitizer.
  - Avoid “social gatherings.”
    - Any and All
    - Even 25 or Less People and Even Outdoors
- Protect your teammates’ health.
  - Sanitize your team’s Capstone lab areas and devices before and after use.
  - Do NOT work with your teammates in person if you have ANY symptoms of ANY sickness.



# COVID Considerations

[3 of 3]

- It is not possible to receive a grade of “incomplete” in CSE498, Collaborative Design.
- Missing a significant amount of time during the semester for whatever reason will most likely result in the need to retake the course.



# Capstone Overview

---

## ➤ Course Logistics

- Client Projects
- Course Logistics (Continued Next Meeting)





# Meeting Attendance

- Significant Impact on Final Grade
- Microsoft Teams Attendees List
  - Who
  - When Joined /Left
- Google Form “Are you there?”
  - Random Times and At End
  - 1 Minute To Respond
  - No Response?
    - Left Meeting
    - Absent

**Google Form  
Attendance Check**

↑↑↑↑↑↑↑↑  
Only An Example





# 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.
- James Mariani
- Teams
  - Status Reports
  - Formal Presentations (30% of Final Grade)
    - Project Plan
    - Alpha
    - Beta
  - Project Videos
- Guest Speaker(s)



# All-Hands Meetings Agendas

- 01/11: Capstone Overview 1
- 01/13: Capstone Overview 2
- 01/18: Risks and Prototypes
- 01/20: Team [Status Report Presentations](#)
- 01/25: Project Plan
- 01/27: Schedule and Teamwork
- 02/01: Team [Project Plan Presentations](#)
- 02/03: Team [Project Plan Presentations](#)
- 02/08: Team [Project Plan Presentations](#)
- 02/10: Team Status Report Presentations
- 02/15: Design Day Booklet Process
- 02/17: Resume Writing and Interviewing
- 02/22: Creating and Giving Presentations
- 02/24: Team [Alpha Presentations](#)
- 03/01: Team [Alpha Presentations](#)
- 03/03: Team [Alpha Presentations](#)
- 03/08: (Spring Break, No Meeting)
- 03/10: (Spring Break, No Meeting)
- 03/15: Intellectual Property
- 03/17: Design Day and the Project Videos
- 03/22: Team Status Report Presentations
- 03/24: Ethics and Professionalism
- 03/29: Team Status Report Presentations
- 03/31: Team Status Report Presentations
- 04/05: Team [Beta Presentations](#)
- 04/07: Team [Beta Presentations](#)
- 04/12: Team [Beta Presentations](#)
- 04/14: Team Status Report Presentations
- 04/19: Team Status Report Presentations
- 04/21: Team Status Report Presentations
- 04/25: Project Videos Due
- 04/26: Project Videos
- 04/27: All Deliverables Due
- 04/28: Project Videos
- 04/28: Design Day Setup
- 04/29: Design Day
- 05/06: Capstone Wrap-Up  
7:45 a.m — 9:45 a.m. ET



# The Capstone Labs

[1 of 2]

## ~~• 3322EB, 3340EB, 3352EB, 3358EB~~

- Door Lock
  - Electronic Keypad
  - Code = #####
  - Do Not Give Out to Other Students
- Systems
  - Up to Three per Team
    - Two 27" iMacs
    - One Dell Rack-Mounted Server (Optional)
  - Team 100% Responsible
    - Building
    - Maintaining
    - Securing
    - Backing Up
- 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 Instructors
  - Obtain Keys from CSE Office





# The Capstone Labs

[2 of 2]

- ~~3322EB~~, 3340EB, 3352EB, 3358EB

- Remote Access  
Instructions will be emailed.

- ~~In Person Access~~

- ~~Fully Vaccinated With Booster Two Weeks Prior~~

- ~~Mask Covering Nose and Mouth~~

- ~~Sanitizing Wipes~~

- ~~Keyboard and Mouse~~

- ~~Desktop~~

- ~~Before and After Use~~

- ~~Hand Sanitizer~~

**In-Person Access Not Available**

- **Until In-Person Classes**
- **Unless Needed by Project**



# Scheduled Lab Times

- No Formal Lab Sessions
- “Credit” for Scheduled Weekly Meetings
  - Team Meetings
  - Client Conference Calls
  - Triage Meetings with Instructors
- Meeting Times TBA With
  - Team
  - Client
  - Instructors
- Students must be available to meet.
  - Team Meetings
  - Triage Meetings
  - Client Conference Calls



# CSE498 Prerequisites

- Must Have Successfully Completed In Advance
  - CSE325 or CSE410
  - CSE335
  - At Least Two CSE Technical 400-Level Courses Chosen From CSE402, CSE404, CSE410, CSE415, CSE420, CSE422, CSE425, CSE431, CSE434, CSE435, CSE440, CSE450, CSE460, CSE471, CSE472, CSE476, CSE477, CSE480, and CSE482
  - WRA (Tier I Writing Requirement)
- 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, instructors or 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. Ally
2. Amazon
3. Anthropocene Institute
4. Auto-Owners
5. Caxy Interactive
6. CSAA Insurance Innovation
7. Delta Dental Knowledge Science 1
8. Delta Dental Knowledge Science 2
9. Evolutio
10. GM
11. Kellogg's
12. Kohl's
13. Lockheed Martin Space
14. Malleable Minds
15. MaxCogito
16. Meijer
17. Michigan State University CSE
18. Michigan State University Linguistics
19. Mozilla
20. MSUFCU
21. Rocket Companies
22. Scout
23. TechSmith
24. Union Pacific
25. United Airlines Airport Operations
26. United Airlines Quality Assurance
27. United Airlines Training
28. Urban Science
29. Vectorform
30. Whirlpool



# Team Ally

## Project Overview

### Ally P2P Lending Platform

- Functionalities
  - Facilitate Loans between Strangers
  - Without the Need for a Bank
  - In Near Real Time
- Features
  - Automatically Assign Risk Score to Each Request
  - Register Customers on Blockchain
  - Track Payment Schedules
- Technologies
  - React / Angular
  - Ethereum Private Blockchain Network



# ally

Detroit, Michigan  
Charlotte, North Carolina

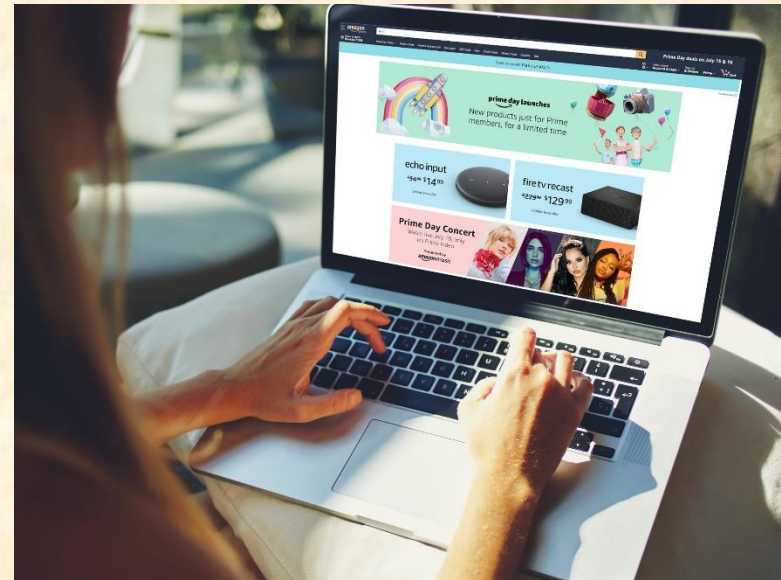


# Team Amazon

## Project Overview

### Amazon Shop Smart: Web Extension for Shopping

- Functionalities
  - Help Prime Members Maximize Benefits
  - And Track Product Information
  - With Browser-based Extension
- Features
  - Design Web Extension Built on AWS
  - Autonomously Track Product Prices
  - Notify Users of Ideal Time to Buy
  - Provide Product Recommendations
- Technologies
  - AWS Cloud Platform
  - JavaScript
  - Amazon QuickSight or Equivalent



Seattle, Washington  
Detroit, Michigan





# Team Anthropocene Institute

## Project Overview

### Wildfire Risks Forecasting Tool

- Functionalities
  - Forecast and Map Future Wildfire Risks
  - Predict Financial and Health Costs of Fires
  - With Robust ML Framework
- Features
  - Synthesis Data from Multiple Sources
  - Develop ML Model to Predict Fire Risks
  - Geographically Map Locations at Risk
- Technologies
  - HTML / CSS / JavaScript
  - Database Technologies
  - Machine Learning



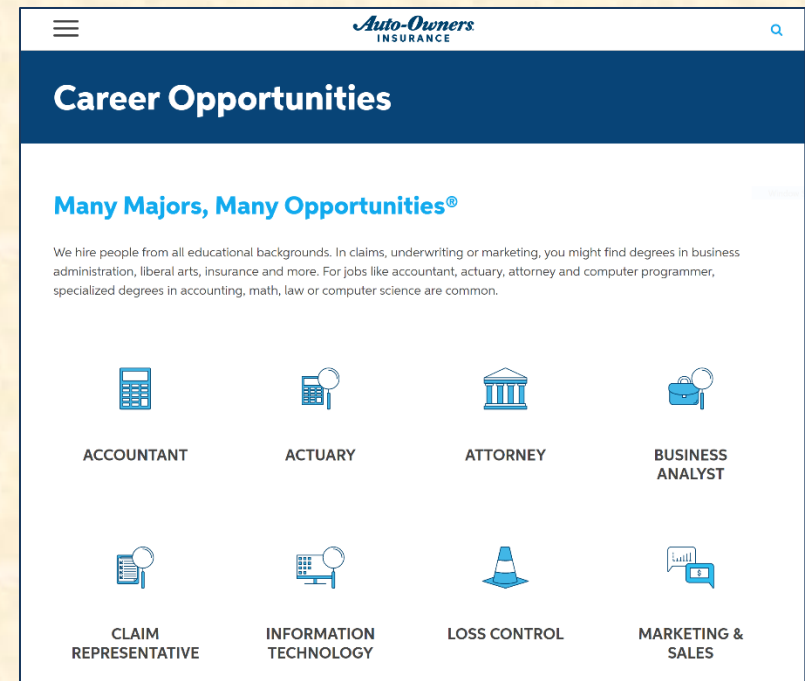


# Team Auto-Owners

## Project Overview

### RecruiTrack

- Functionalities
  - Improve Resource Management
  - For Auto-Owner's Recruiters
  - With Intuitive Web Application
- Features
  - Support the Ability to Insert and Change Data
  - Provide Current Data to Users
    - Specific Entries
    - Summary View
    - Calendar View,
  - Require User Authentication System
  - Display and Summarize Stored Data
- Technologies
  - Microsoft SQL Server
  - Java Spring Boot RESTful API
  - Angular 7+



***Auto-Owners***  
**INSURANCE**

Lansing, Michigan



# Team Caxy Interactive

## Project Overview

### Remote Energy Distribution Payment Platform

- Functionalities
  - Help Manage Energy Dispersion
  - For Near and Off-Grid Households
  - With Online Marketplace
- Features
  - Facilitate the Sale of and Payment for Energy
    - Blockchain
    - Virtual Payment Structure
  - Encrypt All Communication in System
  - Implement Messaging for Customer Communication
- Technologies
  - Cloud Based Messaging Architecture
  - Cloud Based Payment System
  - Digital Currencies / African Preferred
  - Arduino Charging Platform



# Team CSAA Insurance Innovation

## Project Overview

### 3D Scene Reconstruction of Vehicle Accidents

- Functionalities
  - Help Review Vehicular Accidents
  - Through Collision Simulations
  - For Damage Annotation and Analysis
- Features
  - Autonomously Ingest Images and Depth Maps
  - Generate Interactive 3D Environments
  - Provide the Ability to Annotate Vehicular Damage
- Technologies
  - GPU
  - Oculus Rift / Similar VR Headset



# Team Delta Dental Knowledge Science 1

## Project Overview

### General RATE Calculation Environment IDE

- Functionalities
  - Aid Developers in Rate Calculations
  - For a Proprietary Programming Language
  - Through Development of an IDE
- Features
  - Include Standard IDE Features such as:
    - Syntax Validation
    - Error Highlighting
    - Intellisense Completions
  - Generalize to Other Languages
- Technologies
  - Angular
  - ANTLR
  - Git



# Team Delta Dental Knowledge Science 2

## Project Overview

### General RATE Calculation Environment Shell

- Functionalities
  - Aid Developers in Rate Calculations
  - For a Proprietary Programming Language
  - Through Development of Interactive Shell
- Features
  - Support Quick Deployment and Testing
  - Integrate Accessibility for the Non-Technical
- Technologies
  - Java Core
  - ANTLR
  - Git





# Team Evolutio

## Project Overview

### ERP Reserve Preservation Platform

- Functionalities
  - Protect African Rhinos and Elephants
  - By Aiding with Short-Term Alleviation Methods
  - Through an Intuitive Application
- Features
  - Implement Threat Detection
  - Implement an Alert Notification System
  - Provide the Ability to Manage Resources
  - Handle Data From Various Devices
    - Sensors
    - Cameras
  - Use GPS Tracking for Elephants and Rhinos
- Technologies
  - React
  - Python
  - Flask

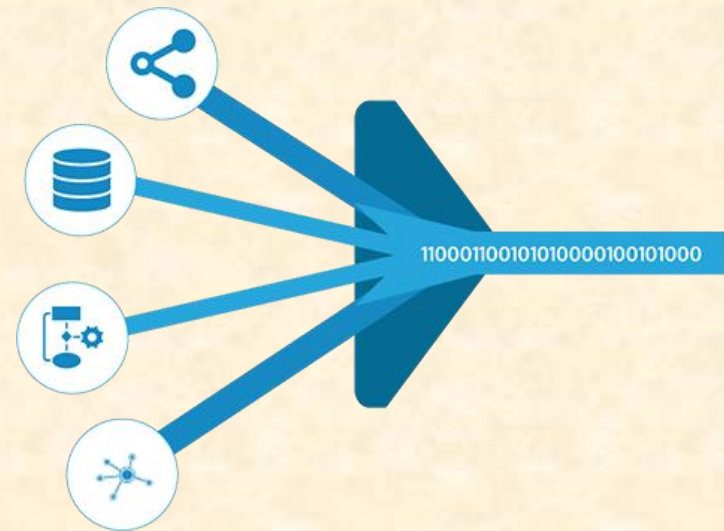


# Team GM

## Project Overview

### High Frequency Data Ingestion

- Functionalities
  - Ingest Telemetry Data
  - At a Rate of Up to 1 Million Files per Minute
  - In an Efficient Manner
- Features
  - Generate New Log Files for Ingestion
  - Import Ingested Data into Existing Database
  - Visualize Statistics
- Technologies
  - SQL
  - Network File Share
  - Data Generator



Detroit, Michigan





# Team Kellogg's

## Project Overview

### Global Business Services Customer Satisfaction

- Functionalities
  - Improve Kellogg's Customer Survey
  - By Improving UX and Dissemination
  - With Web-based Technologies
- Features
  - Redesign UI and UX of Current Survey
  - Explore and Analyze Dissemination Possibilities
  - Build User Behavior Collection Into Survey
  - Analyze User Behavior on Survey
    - Time Spent on Each Question
    - Questions Not Completed
    - Click Sequence Analysis
- Technologies
  - Tableau Visualization
  - R-Studio / R-Shiny
  - Amazon S3
  - Microsoft Suite of Tools



# Team Kohl's

## Project Overview

### Athenaeum

- Functionalities
  - Create Collaboration Platform for Employees
  - That is Fun and Encourages Idea Sharing
  - With Robust Web Application
- Features
  - Design Platform to Replace Stack Overflow
  - Allow Users to Post Questions
  - Provide Upvoting of Questions & Answers
  - Track Users and Give Rewards
  - Easy Integration with Chat Bots
  - Create Easily-Shared Blogging Space
- Technologies
  - Micro Services
  - Cloud Native Technologies

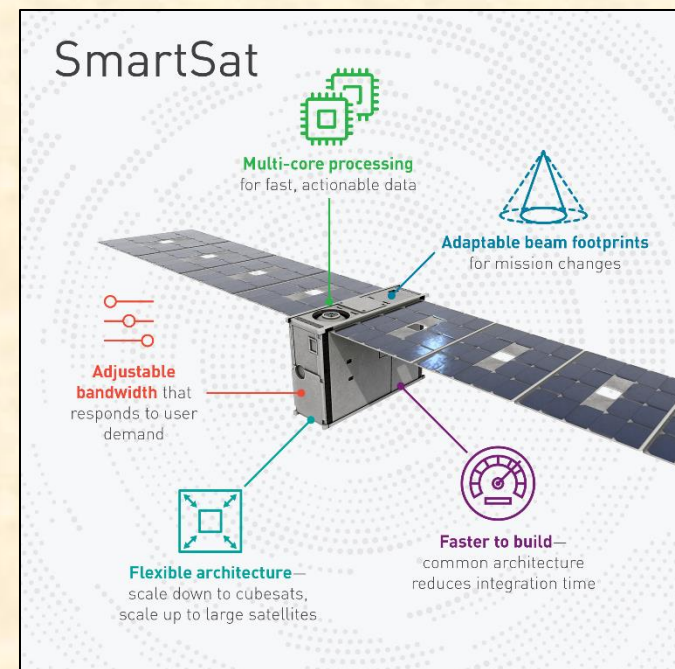


# Team Lockheed Martin Space

## Project Overview

### SmartSat™ Satellite App Store

- Functionalities
  - Maintain Reliability of Satellite Software
  - On the SmartSat™ App Store
  - By Extending App Store Capabilities
- Features
  - Extend Automatic Testing Capabilities
  - Implement Profiling of Applications and SDKs
  - Properly Tracks and Deploys Dependencies
- Technologies
  - React / Flask Backend / PostgreSQL
  - Python
  - Docker Containerization
  - Jenkins Pipeline Continuous Integration
  - Nexus
  - Conan C++ Package Management
  - Embedded Development Exposure
    - Single Board Computers
    - Emulators
    - Yocto Linux
    - VxWorks

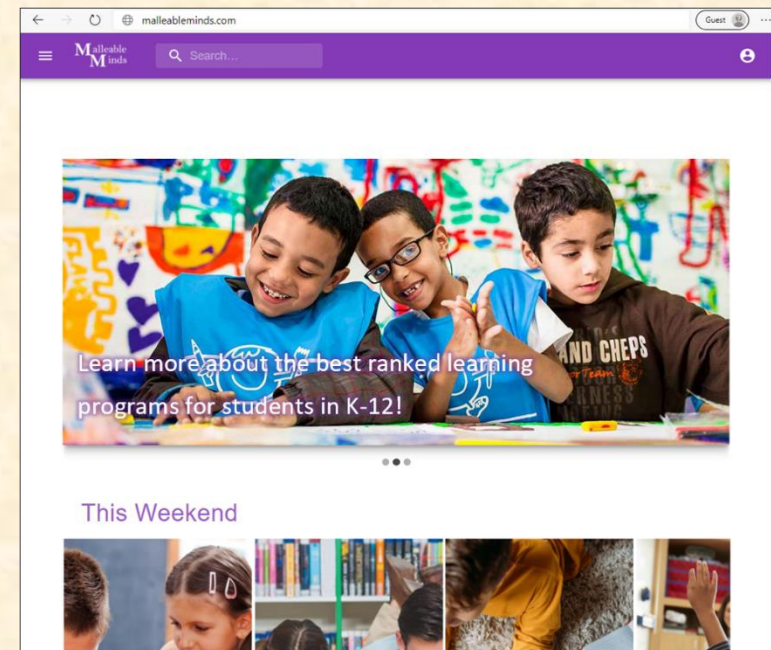


# Team Malleable Minds

## Project Overview

### Advancing PreK-12 Educational Opportunities

- Functionalities
  - Improve User Experience of Clients
  - By Enhancing Existing Review Aggregator
  - Used by Educational Programs
- Features
  - Improve Site Performance
  - Perform Functionality and Integration Tests
  - Offer Additional Pages on the Site
- Technologies
  - React
  - Python
  - Flask
  - Amazon Web Services (AWS)





# Team MaxCogito

## Project Overview

### Blockchain Based Vaccine Passport System

- Functionalities
  - Record Vaccine Status in a Blockchain
  - To Provide a Reliable and Trusted Source
  - Built on Ethereum
- Features
  - Design Java App to Interact with Ethereum
  - Built a Full Ethereum Wallet
  - Write Smart Contracts
  - Deploy Full REST Spring Boot Application
- Technologies
  - Remix IDE
  - Web3j
  - Truffle Blockchain
  - AWS Server
  - QuickNode.io



**MaxCogito**

The company with big ideas

Boston, Massachusetts



# Team Meijer

## Project Overview

Google Form  
Attendance Check

### Meijer Smart Shopper

- Functionalities
  - Streamline and Simplify the Shopping Experience
  - By Integrating Smart Speaker Functionality
  - With the Meijer Website and Mobile App
- Features
  - Offer Shopping List Creation
  - Support Coupon Use While Shopping
  - Alert Users of Favorite Items on Sale
- Technologies
  - Android / Kotlin / Android Studio
  - iOS / Swift / Xcode
  - Microsoft Azure
  - Alexa Voice API



**meijer**<sup>®</sup>

Grand Rapids, Michigan



# Team Michigan State University CSE

## Project Overview

### Data-Driven Mechanic: Applications and Infrastructure

- Functionalities
  - Diagnose Automobiles and Other Systems
  - Based on the Sounds they Emit
  - By Sending Data Signals to a Server for Classification
- Features
  - Streamline Data Capture and Transmission
  - Support Hand-Labeling to Improve Underlying Model
  - Visualize Diagnostics in an Easy-to-Interpret Manner
- Technologies
  - Android / Kotlin / Android Studio
  - iOS / Swift / Xcode





# Team Michigan State University Linguistics

## Project Overview

### On-Premises Automatic Speech Recognition Pipeline

- Functionalities
  - Automate the Transcription Process of Audio Logs
  - To Replace a Paid Cloud Service
  - To Save Time and Money, and Preserve Privacy
- Features
  - Offer Iterative Retraining
  - Support CPU and GPU Use
  - Develop Automatic Speaker Identification
- Technologies
  - Python
  - Machine Learning
  - Natural Language Processing

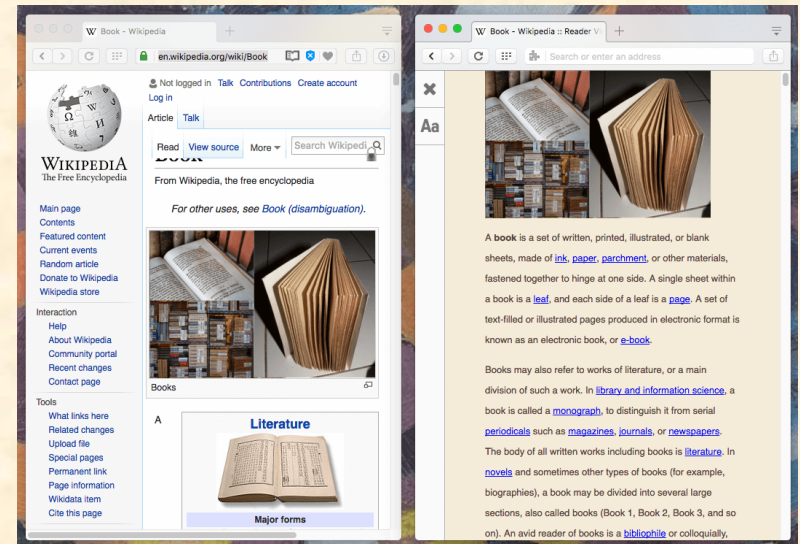


# Team Mozilla

## Project Overview

### Improve Firefox's Reader View

- Functionalities
  - Improve Reader Mode on Firefox Browser
  - By Discovering and Resolving Issues
  - With the Current Software
- Features
  - Determine Issues with Top Sites
  - Implement Solutions to Solve Discovered Problems
  - Fix Issues with the about:reader Page
- Technologies
  - CSS / HTML / JavaScript
  - Windows / OSX / Linux
  - Mercurial / Git / Other Version Control Systems



Mountain View, California

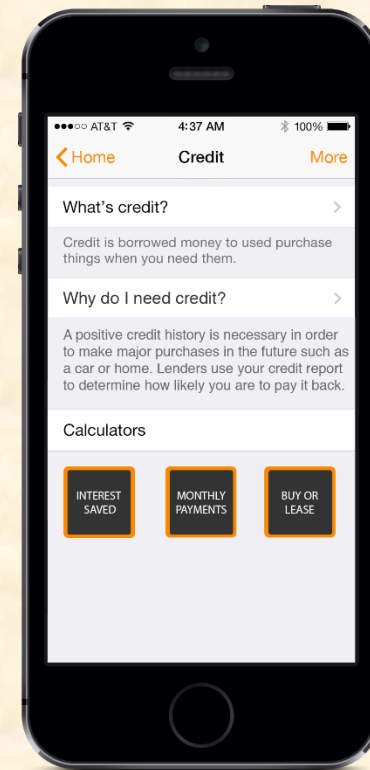


# Team MSUFCU

## Project Overview

### Evergreen 3C: Financial Education Content Library

- Functionalities
  - Automatically Classify Financial Articles
  - For Use in an Educational Service
- Features
  - Identify Articles Based on Content
  - Support Labeling by Target Audience and by Topic
  - Support Complex Searches
- Technologies
  - Azure
  - MongoDB Atlas
  - Python
  - Machine Learning
  - Natural Language Processing



# Team Rocket Companies

## Project Overview

### Team Member Mapping Application

- Functionalities
  - Facilitate In-Person Event Planning
  - To Promote Connectivity
  - With Intuitive Web Application
- Features
  - Provide Location Information of Team Members
  - Provide Distance Information Between Team Members
  - Support Queries to Filter Team Members by Attributes
- Technologies
  - CSS / HTML / JavaScript
  - Microsoft C#
  - ASP.NET
  - Python
  - Go
  - Sift API
  - Google Maps Platform



# Team Scout

## Project Overview

### Smart Little Hunter of Fakes

- Functionalities
  - Mitigate Risk of Purchasing Knockoff products
  - Purchased Through Online Retail
  - By Recognizing Fake Products
- Features
  - Discover Listings Based on Copyrighted Images / Text
  - Compare Results to Official Copyrighted Images / Text
  - Provide the Ability to Flag Listing as Fake
  - Allow System to Learn from Responses
- Technologies
  - Microsoft C#
  - ASP.NET
  - Microsoft Azure SQL
  - Microsoft Azure Cognitive Services
  - ML.NET Model Builder





# Team TechSmith

## Project Overview

### ViSUI : Video Simplified User Interface

- Functionalities
  - Simplify Software Videos
  - By Blocking Text and Simplifying UI
  - To Make Content More Accessible
- Features
  - Suggest Areas of Simplification
  - Support Blocking, Replacing, Blurring
  - Offer Playback Preview
- Technologies
  - Visual Studio Code
  - React
  - Microsoft C# / .Net

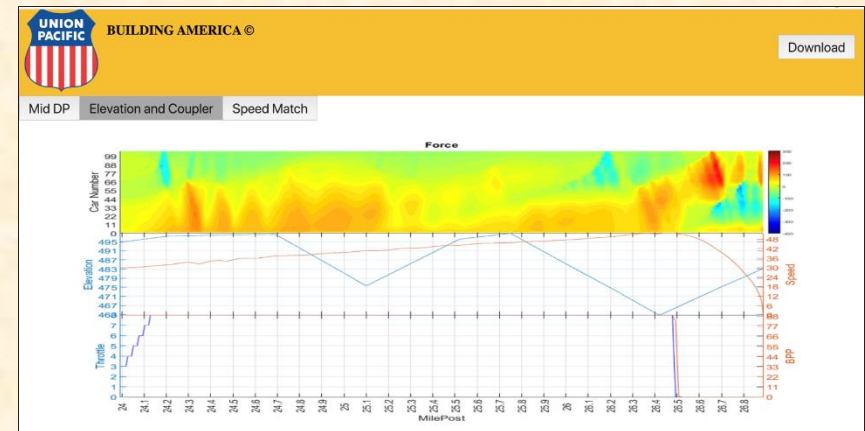


# Team Union Pacific

## Project Overview

### Railroad Data Visualization

- Functionalities
  - Improve Analysis of Train Data
  - On the Buff and Draft Between Train Cars
  - With Easy-To-Understand Visualizations
- Features
  - Build a Website for Inputting and Displaying Data
  - Visualize Input Data on Website
  - Implement Saving of Past Data
  - Implement Dashboard for Viewing Historical Data
- Technologies
  - Java
  - SQL
  - Angular
  - Nebular
  - Additional Web UI Libraries



**BUILDING AMERICA®**

Louisville, Colorado

Omaha, Nebraska





# Team United Airlines Airport Operations

## Project Overview

### Performance Scorecard Automation

- Functionalities
  - Streamline Process of Analyzing Airport Safety
  - Remove Human Error from Process
  - With Autonomous Tool
- Features
  - Create Safety Scorecard that...
    - Synthesizes Data from Many Sources
    - Provides Weighting for Different Values
    - Allows for Bulk Upload of Historical Data
  - Autonomously Produce PPTs and PDFs
- Technologies
  - MS SQL
  - TIBCO Spotfire

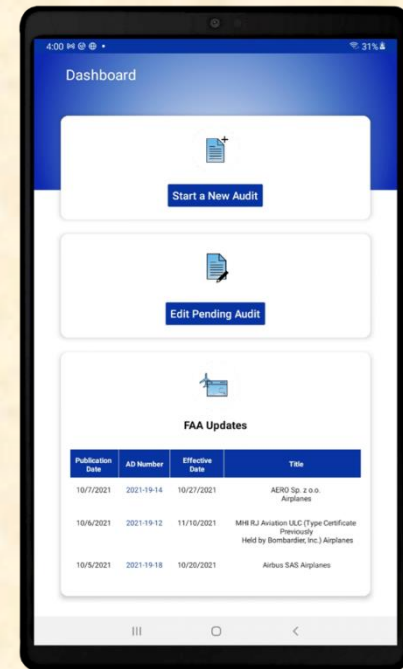


# Team United Airlines Quality Assurance

## Project Overview

### Audit Management System

- Functionalities
  - Simplify and Optimize the Auditing Process
  - For Quality Assurance Employees
  - Through an iOS Application
- Features
  - Provide the Ability to Create / Delete / Manage Audits
  - Implement Checklists for Audits
  - Provide the Ability to Take Pictures for Objective Evidence
  - Implement Scraping of the FAA Website
  - Integrate Database Functionality
- Technologies
  - SQL Database
  - iOS



# Team United Airlines Training

## Project Overview

### Training Forecast Model

- Functionalities
  - Improve Training Resource Usage
  - By Determining what Training Resources are Needed
  - With a Web Application
- Features
  - Forecasting Training Needs for United Airlines Stations
  - Model Where Support Needs to be Provided
  - Ensure the Results Can be Specific to Individual Stations
- Technologies
  - Microsoft SQL Server
  - ASP.NET



# Team Urban Science

## Project Overview

### Customer Insights Dashboard

- Functionalities
  - Provide Insights into Areas of Opportunity
  - For Automobile Dealers
  - By Leveraging Different Kinds of Customer Data
- Features
  - Visualize Insights on a Dashboard
  - Leverage Multiple Kinds of Data
  - Adhere to Urban Science Style Guide
- Technologies
  - Microsoft C# / .NET
  - Angular
  - HTML / CSS

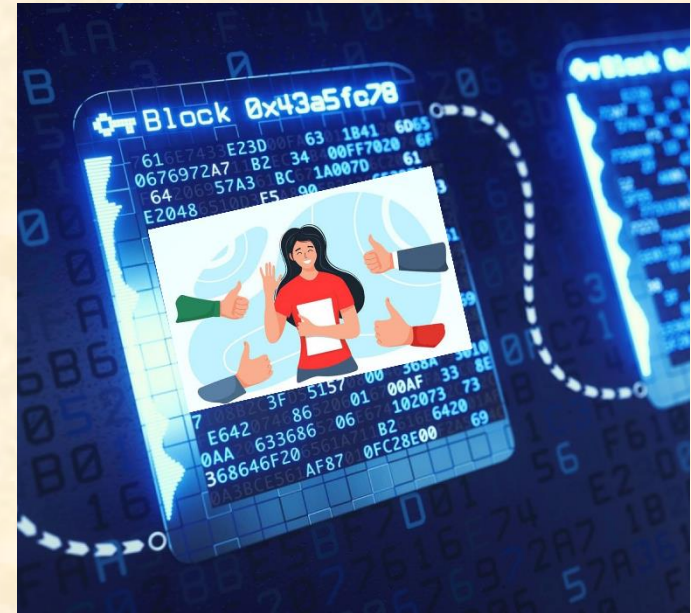


# Team Vectorform

## Project Overview

### Employee Recognition on Blockchain

- Functionalities
  - Recognize Employees for their Achievements
  - By Recording them on a Public Blockchain
  - To Improve Morale and Company Culture
- Features
  - Integrate a Leaderboard to Show Top Employees
  - Show Past History of Kudos for Each Employee
  - Automatically Summarize Kudos into Short Description
- Technologies
  - OpenAI
  - Blockchain
  - SQL





# Team Whirlpool

## Project Overview

### Recipe Progression Tracking

- Functionalities
  - Help Guide Users When Cooking
  - By Providing Feedback and Advice
  - On How the User is Following Instructions
- Features
  - Gather Motion Data from Sensors
  - Determine If the User Completed a Step
  - Provide Suggestions on How to Improve on a Step
  - Store Failed Attempts
  - Provide Future Recommendations and Advice
- Technologies
  - Sensor Data Collection / Preprocessing / Cycle Extraction / Labeling
  - IMU-Based Gait Recognition
  - Decision Making (DCNN)
  - TinyML
  - Embedded / Mobile Application Software Development



# Whirlpool

Benton Harbor, Michigan



# Team Member Survey

---

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





# First Assignments

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



# What's Next?

- Teams

- Receive assignments later today.  
(Keep checking your email.)
- Meet initially later today or 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.
  - Instructors will email remote access instructions.

- Project Sponsor / Client Contact

- Contact by email ASAP and by tomorrow COB (Close of Business).
- Complete conference call or online meeting by Friday.
- Review project proposal.

Questions?

