MICHIGAN STATE UNIVERSITY

09/01,09/06: Capstone Overview

The Capstone Experience

Dr. Wayne Dyksen
James Mariani

Department of Computer Science and Engineering
Michigan State University

Fall 2022

From Students…
…to Professionals

CSE498, Collaborative Design

- "The Capstone Experience"
- Professors
  - Dr. Wayne Dyksen ("Dr. D.")
  - Prof. James Mariani
- Teaching Assistants
  - Tommy Hojnicki (hoy-Nick-ee)
  - Griffin Klevering
  - Luke Sperling
- Class Meetings
  - Tu, Thu 3:00 – 4:20 p.m. Eastern Time
  - All-Hands:
    - STEM 1130
    - Microsoft Teams General Channel
  - Split-Hands:
    - Tommy: Anthony 1320 & Teams Channel
    - Griffin: Anthony 1279 & Teams Channel
    - Luke: STEM 1130 & Teams 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 your email immediately, thoroughly and carefully.

Meeting Goals for 09/01 and 09/06

- 09/01
  - Intro to Capstone Logistics
  - Overview of Projects
  - Team Member Survey
- 09/06
  - Capstone Logistics
  - What's ahead?

Capstone Overview

- Course Logistics

- Client Projects

- Course Logistics (Continued Next Meeting)

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 5-6 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…

Professional Meeting Expectations

- Starts at 3:00 p.m. ET (Eastern Time) Promptly
- Meeting Ready
  - In Person: Seated
  - Microsoft Teams: Joined
  - Ready to Go
  - Looking Professional
- Not Meeting Ready Include But Not Limited To…
  - Entering a Room
  - Walking to a Seat
  - Being in the Process of Sitting Down
  - Joining a Meeting
- No…
  - Other Electronic Devices
    - Phones
    - Laptops
    - Etc.
  - Hats or Hoods
  - Coats
  - Eating
  - Sleeping
  - “Breaks”

Project Deliverables

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

See Major Milestones.

All-Hands/Split-Hands Meetings

Presentations By

- Dr. D.
- James Mariani
- Teams
  - Status Reports
  - Formal Presentations (30% of Final Grade)
  - Project Videos
- Guest Speaker(s)

Weekly Schedule

- 09/01: Capstone Overview 1
- 09/06: Capstone Overview 2
- 09/08: Risks and Prototypes
- 09/13: Team Status Report Presentations
- 09/15: Project Plan
- 09/20: Schedule and Teamwork
- 09/22: Team Project Plan Presentations
- 09/27: Team Project Plan Presentations
- 09/29: Team Project Plan Presentations
- 10/04: Design Day Booklet Process
- 10/06: Creating and Giving Presentations
- 10/11: Resume Writing and Interviewing
- 10/13: Team Alpha Presentations
- 10/18: Team Alpha Presentations
- 10/20: Team Alpha Presentations
- 10/25: Break Day
- 10/27: Intellectual Property
- 11/01: Design Day and the Project Videos
- 11/03: Ethics and Professionalism
- 11/08: Team Status Report Presentations
- 11/10: Team Status Report Presentations
- 11/15: Team Beta Presentations
- 11/17: Team Beta Presentations
- 11/22: Team Beta Presentations
- 11/24: Thanksgiving
- 11/29: Team Status Report Presentations
- 12/01: Team Status Report Presentations
- 12/05: Project Videos Due
- 12/06: Project Videos
- 12/07: All Deliverables Due
- 12/08: Project Videos
- 12/08: Design Day Setup
- 12/09: Design Day
- 12/14: Capstone Wrap-Up
  10:00 a.m. — 12:00 p.m. ET

The Capstone Labs

[1 of 2]

- 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: ???????
- 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
  - At Most One Drawer Per Team
  - Only As Needed
  - Assigned by Instructors
  - Obtain Keys from CSE Office

The Capstone Labs

[2 of 2]

- 3340EB, 3352EB, 3358EB
- Remote Access
  Instructions will be emailed.
- In-Person Access
  - Fully Vaccinated With Booster Two Weeks Prior
  - Sanitizing Wipes
    - Keyboard and Mouse
    - Desktop
    - Before and After Use
  - Hand Sanitizer

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
  - CSE300 (Can Be Waived)
  - CSE325
  - 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

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
    - Hardware
    - 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 to clients. See Downloads.
- Contact Dr. D. or James For Questions.

Project Teams

1. Ally
2. Amazon
3. Anthropocene Institute
4. Atomic Object
5. Auto-Owners
6. CSAA Insurance
7. GM
8. Google
9. Kellogg's
10. Kohl's
11. Lockheed Martin Space
12. Magna
13. Meijer
14. Michigan State University Linguistics
15. Microsoft
16. MSUFCU
17. Roosevelt Innovations Data Science
18. Roosevelt Innovations Knowledge Science
19. RPM
20. Stryker
21. Targets' Tip
22. TechSmith
23. Union Pacific
24. United Airlines Airport Operations
25. United Airlines Quality Assurance
26. United Airlines Training
27. Urban Science
28. Vectorform
29. Volkswagen
30. Whirlpool

Team Ally

Jump to End

Project Overview

Ally Employee Recognition Platform

- Functionalities
  - Recognize Employees for Achievements
  - With a Progressive Web App
  - To Improve Company Morale
- Features
  - Offer a Dashboard for Progress Tracking
  - Implement Multiple Roles
  - Include Real-time Monitoring of Recognition
- Technologies
  - Microsoft Visual Studio
  - React
  - Microsoft SQL Server

Detroit, Michigan
Charlotte, North Carolina

Team Amazon

Project Overview

Amazon Review Confidence Tool

- Functionalities
  - Increase Buyer Trust and Loyalty
  - By Highlighting Low Quality Reviews
  - Utilizing a Visually Intuitive Web App
- Features
  - Design Review Analysis Web App
  - Calculate Confidence Scores for Reviews
  - Detect Illegitimate or Low - Quality Reviews
  - Display Altered Scores Without Poor Reviews
- Technologies
  - AWS – Lambda, API Gateway, DynamoDB
  - Programming language with Data Science capability
  - Javascript Framework

amazon

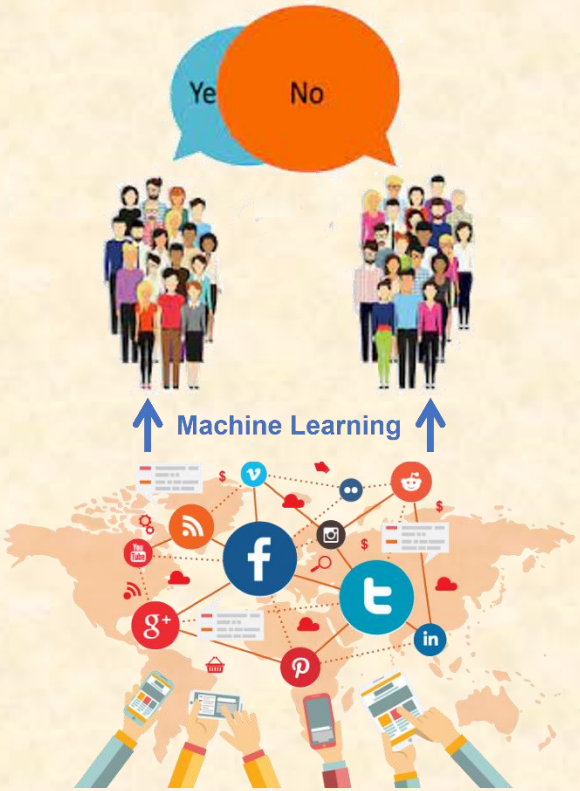
Seattle, Washington
Detroit, Michigan

Team Anthropocene Institute

Project Overview

Public Opinions on Nuclear Energy from Social Media

- Functionalities
  - Determine Public Opinion on Nuclear Power
    - Utilizing Social Media Platforms
    - And Machine Learning
- Features
  - Highlight Public Opinion on Social Media
  - Integrate Data from Multiple Platforms
  - Apply Machine Learning Analysis to Data
  - Provide Methods to Spread Correct Data
- Technologies
  - Sprout Social
  - Hootsuite
  - Machine Learning



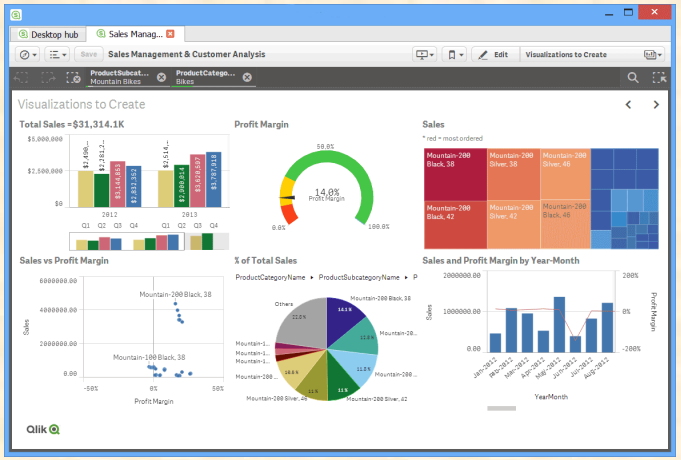
Anthropocene Institute
Palo Alto, California

Team Atomic Object

Project Overview

Custom Data Visualization Dashboard

- Functionalities
  - Make Tracking Client Projects Easy
  - By Visualizing Data From Multiple Data Sources
  - With a Customizable Dashboard
- Features
  - Create a Customizable Dashboard
  - Design Functionality on Multiple Platforms
  - Draw Data from many Data Sources and APIs
  - Conduct User Interviews for Preferences
- Technologies
  - Web-based data visualization library
  - Database Technologies



ATOMIC OBJECT

Grand Rapids, Michigan

Team Auto-Owners

Project Overview

A-O Merch Search

- Functionalities
  - Modernize Internal Merch Ordering Process
  - For Auto-Owners Employees
  - With Secure Ordering Website
- Features
  - Secure Log-In Screen
  - Virtual Shopping Experience
    - Item Browsing, Searching, and Adding to Cart
    - Cart Review and Order Completion
  - Gather Purchase Analytics
    - Item Data and Demographic Information
- Technologies
  - Microsoft SQL Server
  - Java Spring Boot RESTful API
  - React JS

Auto-Owners INSURANCE

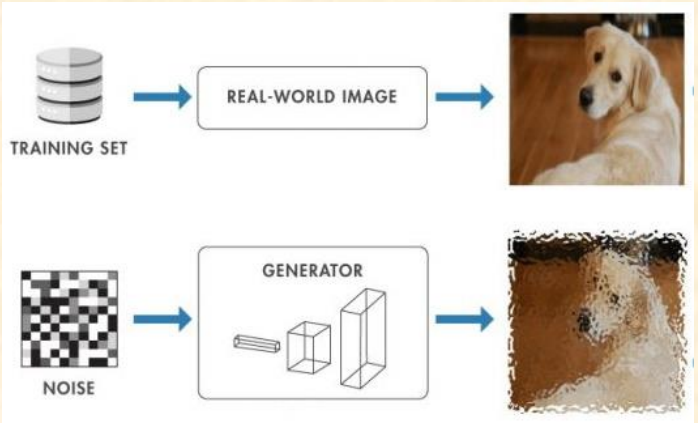
Lansing, Michigan

Team CSAA Insurance

Project Overview

Synthetic Image Generation via Random Noise

- Functionalities
  - Build Models for Different Vehicle Types
  - With Synthetic Crash Images
  - For Improved Digital Reconstruction of Crashes
- Features
  - Build a Model Trained on Real Images
  - Produce Novel Images From Model
    - Build Dataset Consisting of Real and Synthetic Images
    - Request Synthetic Images on Website
  - Create Model Trained on New Dataset
    - Analyze Image Generation Across Vehicle Types
- Technologies
  - Pytorch
  - GPU or Google Colab
  - Microsoft SQL Server
  - React JS



Insurance

Walnut Creek, California

Team GM

Project Overview

Augmented Reality Utilizing IoT Technology

- Functionalities
  - Integrate Hardware with Augmented Reality
  - As a Proof-of-Concept for Future Projects
  - Using IoT Devices
- Features
  - Integrate Actions in AR with a Physical Actuator
  - Support Eye-Tracking and Voice Commands
  - Interface between Hardware and Software
- Technologies
  - Microsoft HoloLens 2
  - Raspberry Pi
  - Actuator / Robotic Arm
  - Flask
  - Unreal Engine

Detroit, Michigan

Team Google

Project Overview

Android Exploit Fuzzing Analysis

- Functionalities
  - Determine Vulnerabilities within Linux
  - To Secure Android Devices
  - Utilizing Fuzzing Bug Detecting Methods
- Features
  - Develop Fuzzers for the Linux Kernel
  - Execute Fuzzers Across Linux Systems
  - Analyze Vulnerabilities within Android OS
  - Create a Fuzzer Dashboard
- Technologies
  - Syzkaller
  - Golang
  - C
  - Angular
  - MySQL
  - GKE

Google

Kirkland, Washington
Mountain View, California

Team Kellogg's

Project Overview

Templatize R Development via Design Thinking

- Functionalities
  - Improve Sales Experience of Kellogg's Products
  - By Redesigning GBS Applications
  - For ADA and Corporate Image Compliance
- Features
  - Examine Kellogg App Catalog
    - Identify Business Context and Intended Users
  - Provide Standardized App Layout
    - Guided by Business Analytics and Sustainment
    - Offer Standard Functionalities Across Apps
  - Implement New Layout to Existing Apps
- Technologies
  - R Studio / R Shiny
  - CSS / HTML / JavaScript
  - Amazon Redshift / S3
  - Tableau

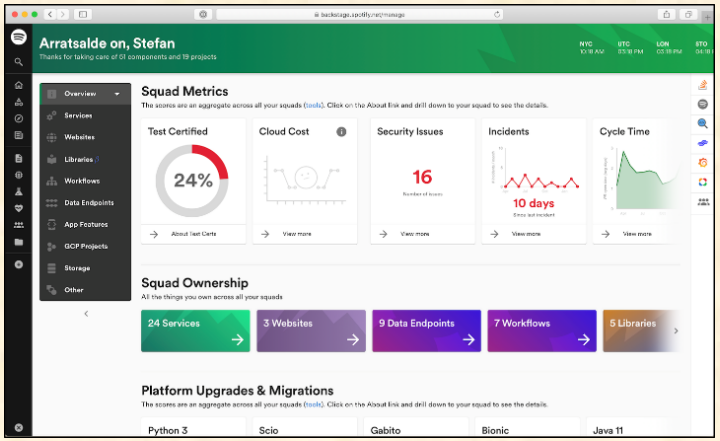
Battle Creek, Michigan

Team Kohl's

Project Overview

Backstage's Back Alright

- Functionalities
  - Improve Efficiency and Organization
  - Of Software Products in Development
  - With Internal Developer Portal
- Features
  - Build Developer Portal Website
    - Support Product Development
    - Execute Product Deployment
  - Integrate Project Resource Setup
    - Git Creation
    - Platform Resources
  - Establish Development Pipeline
- Technologies
  - Microservices
  - Cloud Native Technologies
  - JavaScript / TypeScript
  - React

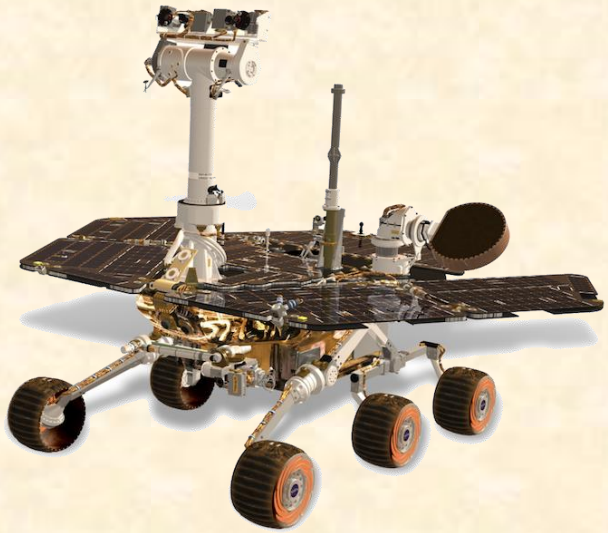


Team Lockheed Martin Space

Project Overview

LiDAR and Image Fusion for Autonomous Navigation

- Functionalities
  - Implement Navigation
  - On Lunar Mobility Vehicle
  - With Lightweight Obstacle Detection
- Features
  - Ingest and Process Images From Sensors
    - LiDAR Point Clouds
    - Stereo Images
  - Create Reproducible Tests on Data
    - Live and Synthetic
  - Deploy App on SmartSat™ Framework
- Technologies
  - Simultaneous Localization and Mapping (SLAM)
  - Robotic Operating System (ROS)
  - Embedded Software Exposure
    - Yocto Linux, VxWorks, Single Board Computers, and Emulators



LOCKHEED MARTIN

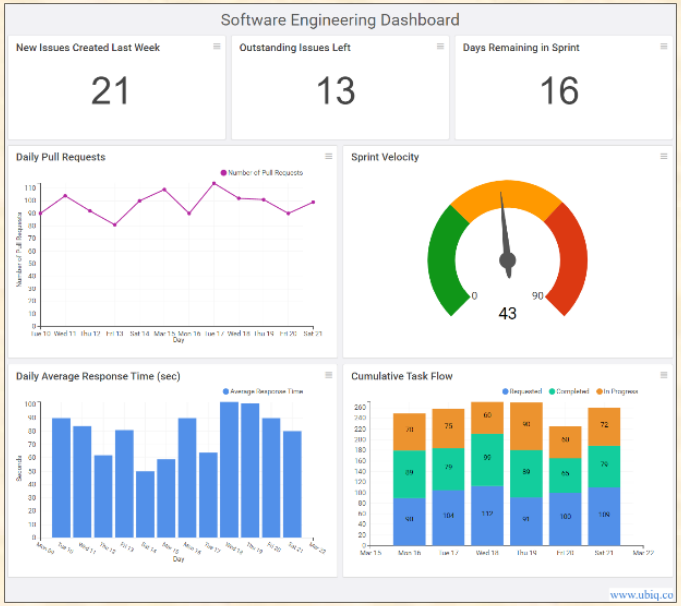
Littleton, Colorado

Team Magna

Project Overview

Dashboard for Data Visualization

- Functionalities
  - Automate the Data Visualization Process
  - With a Flexible Solution
  - Designed for an Existing Data Platform
- Features
  - Visualize Metrics and Data
  - Display Long-term and Short-term Information
  - Implement Robust Data Filtering and Sorting
- Technologies
  - Microsoft Power BI
  - QuickSight
  - Amazon Web Service



Tory, Michigan
Aurora, Ontario, Canada

Team Meijer

Project Overview

Meijer Simply Give Automation

- Functionalities
  - Provide Larger Support to Food Pantries
  - By Expanding Simply Give Program
  - Through Standalone Digital Platform
- Features
  - Design and Build Simply Give Page
    - mPerks App
    - Meijer Website
  - Accept and Process Payment Securely
  - Display Local Area Benefitted by Contributions
- Technologies
  - Swift or React Native
  - ReactJS or Blazor WebAssembly
  - Microsoft Azure Web API / SQL / DevOps
  - Microsoft Power BI

meijer

Grand Rapids, Michigan

Team Michigan State University Linguistics

Project Overview

Mobile App for Remote Recording

- Functionalities
  - Facilitate Sound Recording for Research Projects
  - With a User-Friendly Sound Recording Mobile App
  - Offer a Non-Coder-Friendly Experience
- Features
  - Support High-Quality Recordings Tied to User Accounts
  - Integrate Gamification to Incentivize Engagement
  - Provide Extensive Documentation and User Guide
- Technologies
  - iOS / Swift
  - Android Studio

East Lansing, Michigan

Team Microsoft

Project Overview

Making STEM Papers Accessible to ASL Users

- Functionalities
  - Aid ASL Users in Reading STEM Papers
  - By Providing Translations of Words and Phrases
  - With Machine Learning
- Features
  - Include Both a 1-to-1 Mapper and a Robust Model
  - Use Cross-Lingual Entity Linking for Translation
  - Automatically Identify Concepts to Translate
- Technologies
  - Python
  - Machine Learning

Microsoft

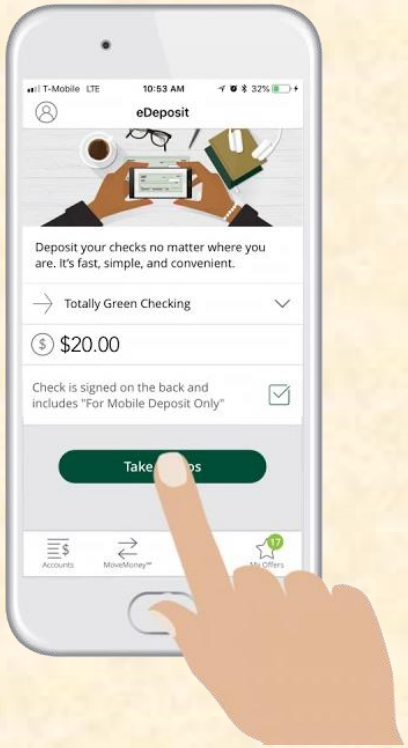
Redmond, Washington

Team MSUFCU

Project Overview

Digital Transformation of Member Data

- Functionalities
  - Enhance Customers' Banking Experience
  - With Personalized Spending Analysis
  - Offering Local Alternatives with Discounts
- Features
  - Categorize Expenditures
  - Extract Spending Habits and Offer Analysis
  - Provide Alternate Options
    - Within Local Loyalty Program
- Technologies
  - HTML5/HTML/CSS
  - JavaScript or related frameworks
  - Android Development (Java/Kotlin)
  - iOS Development (Objective-C/Swift)
  - MySQL
  - PHP
  - NFT Reader



msufcu

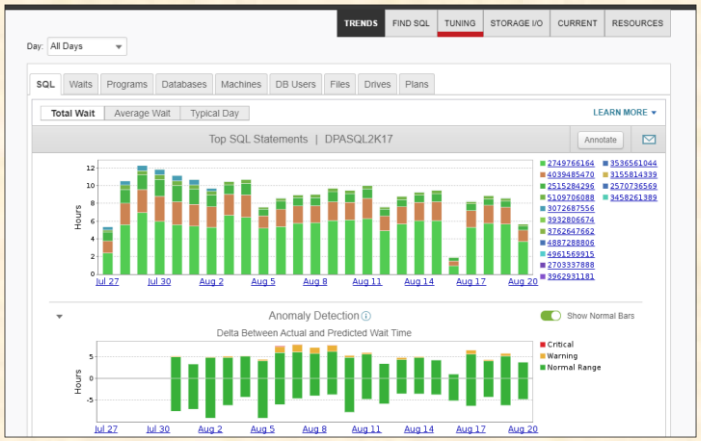
East Lansing, Michigan

Team Roosevelt Innovations Data Science

Project Overview

Provider Anomaly Analytics Toolkit

- Functionalities
  - Provide Risk Scores and Recommendations
  - For Insurance Providers
  - Based on Data from Multiple Sources
- Features
  - Leverage Machine Learning to Automate Process
  - Visualize Suggestions with Web Components
  - Aggregate and Store Relevant Data
- Technologies
  - Streamlit
  - Snowflake
  - Docker
  - CSS / HTML / Javascript / Angular



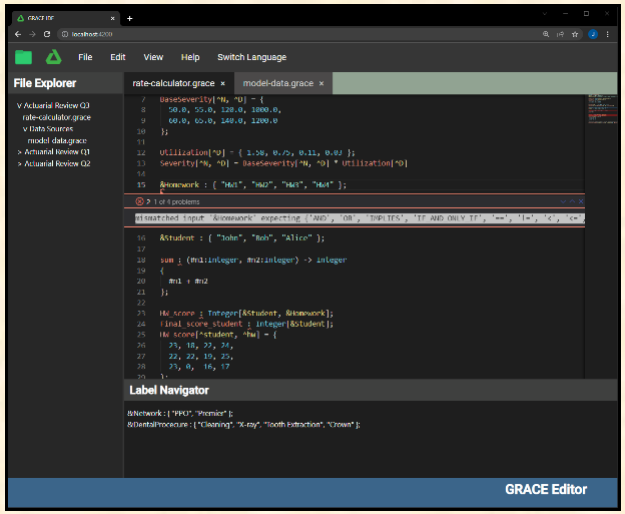
Roosevelt
simple. seamless. smart.
Okemos, Michigan

Team Roosevelt Innovations Knowledge Science

Project Overview

DSL IDE Test Harness

- Functionalities
  - Enhance an Existing Rate Calculation IDE
  - With More Features
  - And Quality-of-Life Improvements
- Features
  - Offer a Java-based Microservice to Perform Rate Calculations
  - Integrate Easy Testing into Front End
  - Automatically Import Data from Outside Sources
- Technologies
  - Angular
  - ANTLR
  - Git
  - Quarkus



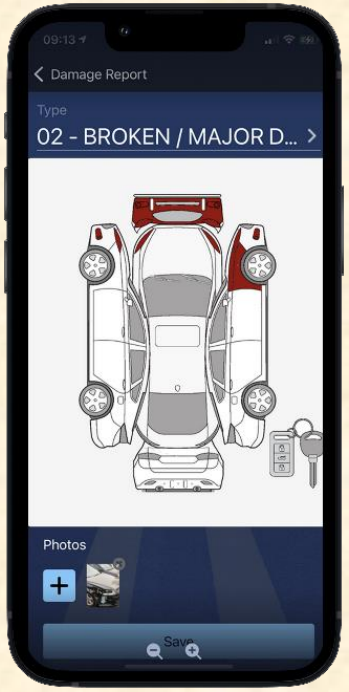
Roosevelt
simple. seamless. smart.
Okemos, Michigan

Team RPM

Project Overview

RPM Drive™ Mobile App Extension and Enhancements

- Functionalities
  - Increase Use of Mobile App
  - For Discovering, Booking, and Tracking Shipments
  - Through New Features and Loyalty Rewards
- Features
  - Provide Manual Search Shipments By Trip Details
  - Implement Automatic Smart Shipment Suggestions
  - Show Shipment Catalog for User to Browse
  - Handle Bidding and Accepting Tenders in App
- Technologies
  - Xamarin
  - Tensorflow / Pytorch
  - SciKit



Royal Oak, Michigan

Team Stryker

Project Overview

Technology Driven Inventory Optimization

- Functionalities
  - Develop a Suite of Tools Using Blockchain
  - To Handle Supply of Surgical Kits
  - That Simplifies and Streamlines the Process
- Features
  - Provide Transparency on all Operations
  - Offer a Simple User Interface
  - Support Web and Mobile Apps for Different Roles
- Technologies
  - Blockchain
  - IoT
  - Microsoft Power BI

stryker

Kalamazoo, Michigan

Team Targets' Tip

Project Overview

Sharing Advice on Academic Harassment

- Functionalities
  - Support Survivors of Academic Harassment
  - By Connecting Them with Peers
  - Utilizing Robust Phone and Web Applications
- Features
  - Design Phone and Web Applications
  - Gather, Store, and Categorize User Data
  - Create User Connections Based on Preferences
  - Facilitate Communication Between Users
- Technologies
  - IOS
  - Android / Android Studio
  - Database Technologies
  - Modern Web Framework

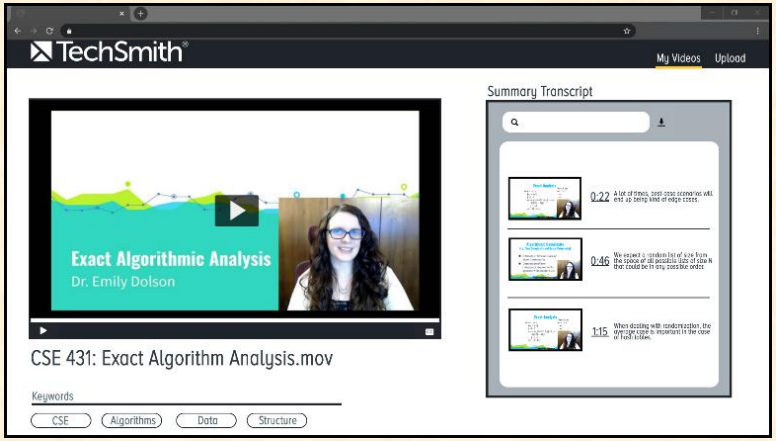
East Lansing, Michigan

Team TechSmith

Project Overview

TARA: TechSmith Asset Recommendation Assistant

- Functionalities
  - Support Users in Creating Engaging Videos
  - By Analyzing Video and Audio
  - And Recommending Assets for Inclusion
- Features
  - Leverage Computer Vision to Analyze Video
  - Suggest Content for Specific Portions of Video
  - Identify Text and Objects to Improve Search
- Technologies
  - Machine Learning
  - Microsoft Visual Studio
  - React
  - FFMpeg
  - Microsoft C# / .NET



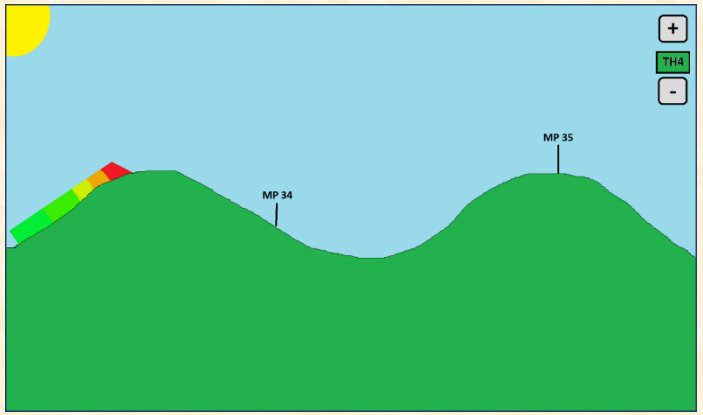
TechSmith®
Okemos, Michigan

Team Union Pacific

Project Overview

Mobile Train Handling Simulator

- Functionalities
  - Offer Accessible Locomotive Engineer Training
  - For Handling Buff and Draft Forces in Distributed Power
  - Through Mobile Simulation Application
- Features
  - Build Mobile Simulation Application
    - Implement Power, Braking, and Direction Controls
  - Design Virtual Terrain and Trains
    - Build Scaled Models
    - Simulate All Forces Present Proportional to Scale
  - Visualize Forces on Individual Train Cars
- Technologies
  - Unity
  - Android
  - iOS
  - WebGL



BUILDING AMERICA®

Louisville, Colorado
Omaha, Nebraska

Team United Airlines Airport Operations

Project Overview

Injury and Damage Data Quick Access App

- Functionalities
  - Increase Airport Safety Measures
    - By Quickly Viewing Airport Incident Data
    - Utilizing an Intuitive Mobile Application
- Features
  - Search For Incident Data From Many Airports
    - Display High Level or Specific Incident Data
    - Build a Mobile Application on Multiple Oss
    - Design Email Sharing Functionality
- Technologies
    - SQL Server
    - AO Metrics Dashboard
    - ARB SharePoint Data
    - Apple iPhones (IOS)
    - Google Android Phones

UNITED

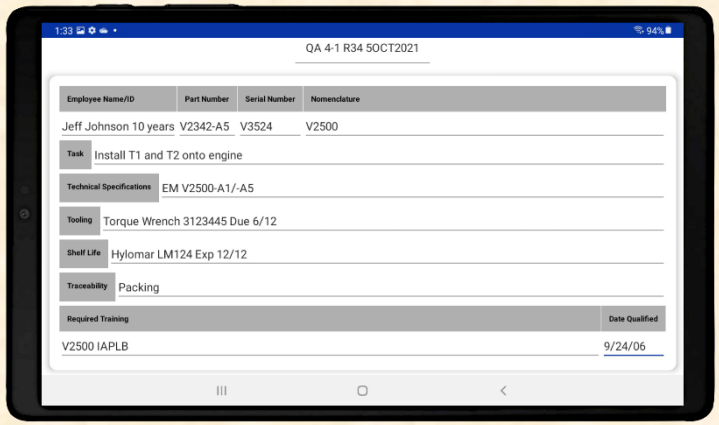
Chicago, Illinois

Team United Airlines Quality Assurance

Project Overview

Audit Management System

- Functionalities
  - Create a Safer Airline
  - By Improving the Airplane Inspection Process
  - Utilizing an intuitive IOS App
- Features
  - Integrate Data into Databases
  - View and Manage Audits
  - Develop Customizable Reports
  - Visualize Important Historical Data
  - Create External Email Functionality
  - Build an intuitive Mobile Phone App
- Technologies
  - IOS
  - AWS



UNITED

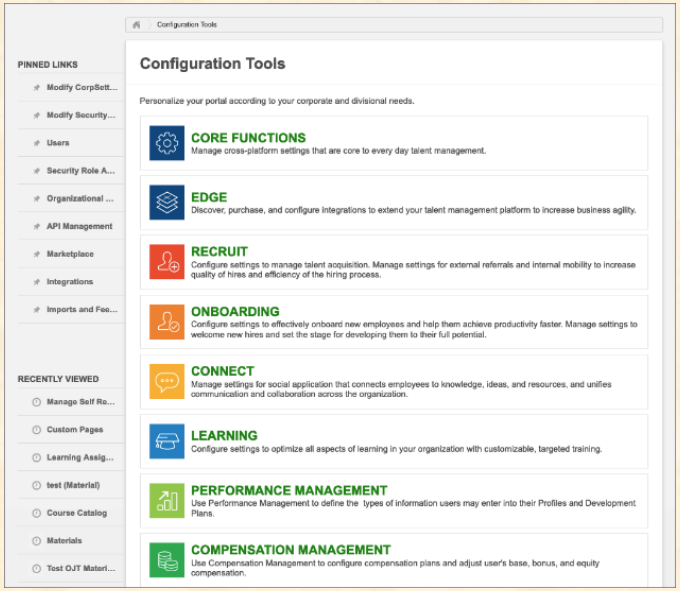
Chicago, Illinois

Team United Airlines Training

Project Overview

Efficacy Testing within United's Cornerstone LMS

- Functionalities
  - Increase Instructor Efficiency and Quality
  - By Locating Patterns in Coursework
  - Through an Electronic Exam Application
- Features
  - Design an Electronic Exam Application
  - Analyze Student Answers in Coursework
  - Identify Patterns in Instructor Instruction
  - Detect Instructor Quality and Efficiency
- Technologies
  - TakeOff – Cornerstone LMS



UNITED

Chicago, Illinois

Team Urban Science

Project Overview

Dealership Parts and Service Telematic Insights

- Functionalities
  - Increase Customer Retention and Increase Profits
  - By Visualizing Vehicle Telematic Information
  - Utilizing a Secure Web App
- Features
  - Develop Role Based Authorization LogIn
  - Integrate Data into Existing Database
  - Visualize Diagnostic Data
  - Highlight Patterns and Summarize Statistics
- Technologies
  - Windows
  - Visual Studio
  - SQL Server
  - C# .NET
  - Angular
  - Typescript
  - GIT
  - Node.js

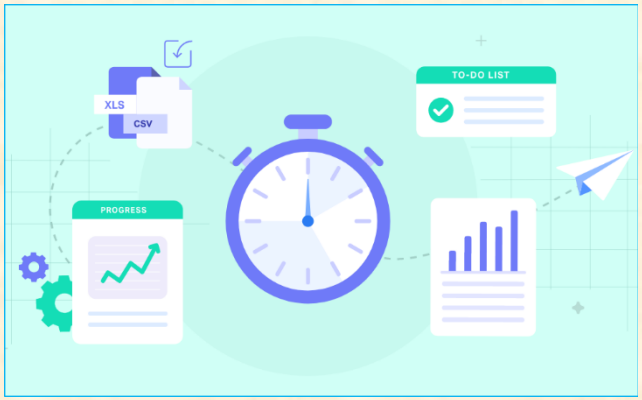
URBAN SCIENCE
Detroit, Michigan

Team Vectorform

Project Overview

Time Cube

- Functionalities
  - Track Time Spent on Billable Projects
  - Using a Desktop Device Monitoring Workstation
  - To Provide Automatic Time Tracking
- Features
  - Interface Physical Device with Computer
  - Automatically Recognize Different Projects
  - Provide a Low-interaction Method of Tracking Time
- Technologies
  - React
  - Bluetooth
  - Arduino
  - C++
  - Node.js



Vectorform
Royal Oak, Michigan

Team Volkswagen

Project Overview

Volkswagen Electric Vehicle Recommender App

- Functionalities
  - Match Drivers with their Ideal Electric Vehicle
  - According to their Driving History
  - Utilizing an Easy to Use Mobile and Web App
- Features
  - Identify Relevant Capabilities of Electric Cars
  - Capture Data from Volkswagen and Other Users
  - Integrate Algorithms to Match Users with Ideal Car
  - Create an Intuitive Web and Mobile App
- Technologies
  - IOS / Android SDK
  - AWS (EC2 / Lambda, RDS)
  - Angular / React

Auburn Hills, Michigan

Team Whirlpool

Project Overview

Guided Recipe Augmentation

- Functionalities
  - Provide a Technology Based Recipe Cooking Option
  - With Streamlined and Easier to Follow Experience
  - Through User Centered Controls
- Features
  - Display a Recipe for User to Follow
  - Collect and Process Data
    - Motion Data
    - Voice Data
    - NFC Tags
    - Appliance Data
  - Develop Gesture and Voice Recognition Models
- Technologies
  - Flutter
  - Python
  - Pytorch / Tensorflow
  - Apaia / Speech Recognition
  - OpenCV

Whirlpool

Benton Harbor, Michigan

Team Member Survey [1 of 2]

- Check Student ID
- Use Upper and Lower Case
  - Yes: Dyksen, Michigan
  - No: DYKSEN, MICHIGAN
- Hometown Country, NOT County
  - Yes: USA, China
  - No: Ingham, Wayne
- Use Floating-Point Number Only For GPA
  - Yes: 3.7, 2.8
  - No: 3.5-3.7, ~3.5, About 3.5

Team Member Survey [2 of 2]

- Get out your laptops.
- Open browser.
- Log into Google with MSU credentials.
- 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 Website.
- Check out the Lab.
  (3340EB, 3352EB, 3358EB)
  - See if you can find it.
  - See if you can get in.
- Find the meeting slides.
  capstone.cse.msu.edu/schedules/weekly-schedule

What's ahead?

- Teams
  - Receive team assignments later today. (Keep checking your email.)
  - Meet initially later today or by tomorrow morning at the latest in person or via 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 certainl by tomorrow COB. (COB == Close of Business)
  - Complete conference call or online meeting by Friday.
  - Review project proposal.

Questions?