MICHIGAN STATE UNIVERSITY

08/27,08/29: Capstone Overview

The Capstone Experience

Dr. Wayne Dyksen
James Mariani

Department of Computer Science and Engineering
Michigan State University

Fall 2024

From Students…
…to Professionals

CSE498, Collaborative Design

- "The Capstone Experience"
- Professors
  - Dr. Wayne Dyksen ("Dr. D.")
  - Prof. James Mariani
- Team Managers (TMs)
  - Samantha (Sam) Kissel
  - Griffin Klevering
  - Luke Sperling
- Class Meetings
  - Tu, Thu 3:00 – 4:20 p.m. Eastern Time
  - All-Hands:
    - 1130 STEM
    - Microsoft Teams General Channel
  - Split-Hands:
    - Sam: 1130 STEM
    - Griffin: 1281 Anthony Hall
    - Luke: 115 International Center
- 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 08/27 and 08/29

- 08/27
  - Introduction to Capstone Logistics
  - Overview of Projects
  - Team Member Survey
- 08/29
  - 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 14 (Short) Weeks

Course Goals

[3 of 3]

- Build a significant software system for a customer.
- Gather requirements.
- Work in a team 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

- All-hands
  - Dr. D.
  - James Mariani
  - Luke Sperling
  - Guest Speaker(s)
- Split-Hands
  - Team Status Reports
  - Team Formal Presentations (30% of Final Grade)
  - Team Project Videos

Weekly Schedule

- 08/27, Tu: Capstone Overview 1
- 08/29, Th: Capstone Overview 2
- 09/03, Tu: Risks and Prototypes
- 09/05, Th: Project Plan
- 09/10, Tu: Team Status Report Presentations
- 09/12, Th: Schedule and Teamwork
- 09/17, Tu: Team Project Plan Presentations
- 09/19, Th: Team Project Plan Presentations
- 09/20, Fr: Team Photos (9:00 a.m. – 5:00 p.m.)
- 09/24, Tu: Team Project Plan Presentations
- 09/26, Th: Design Day Booklet Process
- 10/01, Tu: Creating and Giving Presentations
- 10/03, Th: Resume Writing and Interviewing
- 10/08, Th: Intellectual Property
- 10/10, Th: Team Alpha Presentations
- 10/15, Tu: Team Alpha Presentations
- 10/17, Tu: Team Alpha Presentations
- 10/22, Tu: October Break
- 10/24, Th: Design Day and the Project Videos
- 10/29, Tu: Ethics and Professionalism
- 10/31, Th: Team Status Report Presentations
- 11/05, Tu: Team Status Report Presentations
- 11/07, Th: Team Status Report Presentations
- 11/12, Tu: Team Status Report Presentations
- 11/14, Th: Team Beta Presentations
- 11/19, Tu: Team Beta Presentations
- 11/21, Th: Team Beta Presentations
- 11/26, Tu: Team Status Report Presentations
- 11/28, Th: Thanksgiving
- 12/01, Su: Project Videos Due
- 12/03, Tu: Project Videos
- 12/04, We: All Deliverables Due
- 12/05, Th: Project Videos
- 12/05, Th: Design Day Setup (12:30 p.m. – 3:00 p.m.)
- 12/06, Fr: Design Day
- 12/08, We: Capstone Wrap Up (10:00 a.m. – 12:00 p.m.)

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
- In-Person Access
  - Sanitizing Wipes
    - Keyboard and Mouse
    - Desktop
    - Before and After Use
  - Hand Sanitizer
- Remote Access
  Instructions will be emailed.

Scheduled Lab Times

- No Formal Lab Sessions
- “Credit” for Scheduled Weekly Meetings
  - Team Meetings
  - Client Conference Calls
  - Triage Meetings with TMs
- Meeting Times TBA With
  - Team
  - Client
  - TMs
- Students must be available to meet in person.
  - Team Meetings
  - Triage Meetings
  - Client Conference Calls
- Schedule Accommodations
  - Made For Reasonable Requests
  - Not Made For
    - Working Unreasonable Number of Hours
    - Commuting Distance to Campus

CSE498 Prerequisites

- Must Have Successfully Completed In Advance
  - CSE300
  - 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
  - Tier I Writing Requirement (WRA 101 or WRA 195H)
- 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
  - Sponsor/client 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
  - Course Feature, Not Bug
- Must Be Approved by Instructors

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.
- Not Willing to Sign Affects Project Choice

Project Teams

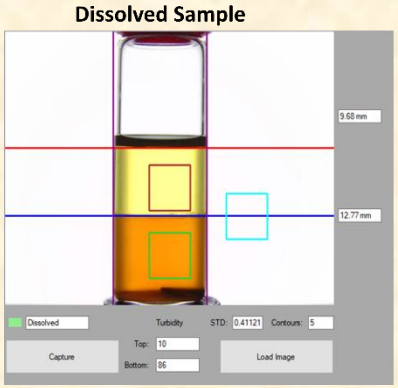
1. AbbVie
2. Ally
3. Amazon
4. Anthropocene Institute
5. Auto-Owners
6. DRIVEN-4
7. GM RIS
8. GM WHMS
9. HAP
10. Henry Ford Innovations RSE
11. Henry Ford Innovations RSVP
12. Kohl's
13. Launch
14. Magna MADO
15. Magna TDD4ES
16. Magna VNNG
17. Magna WFG4ADAS
18. Meijer
19. Michigan State University CSE
20. MSUFCU
21. Roosevelt Innovations Knowledge Science
22. RPM
23. Stryker IST
24. TechSmith
25. Union Pacific
26. Urban Science
27. Vectra AI
28. Volkswagen
29. Whirlpool
30. WK Kellogg Co

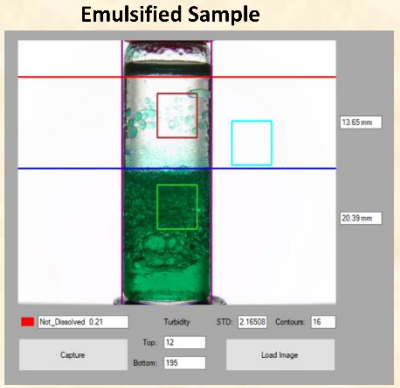
Team AbbVie

Project Overview

Image Analysis Tool for Biphasic Solutions

- Functionalities
  - Make Solvent Development Easier
  - By Making Sample Testing Faster
  - Utilizing Machine Learning Tactics
- Features
  - Design a Machine Learning Model that Will:
    - Detect Vials Within an Image
    - Detect and Save Key Metadata
    - Identify Key Solution Features
  - Visualize Results
  - Design Secure User Authentication
  - Develop a Model Retraining Mechanism
- Technologies
  - Visual Studio
  - OpenCV





abbvie

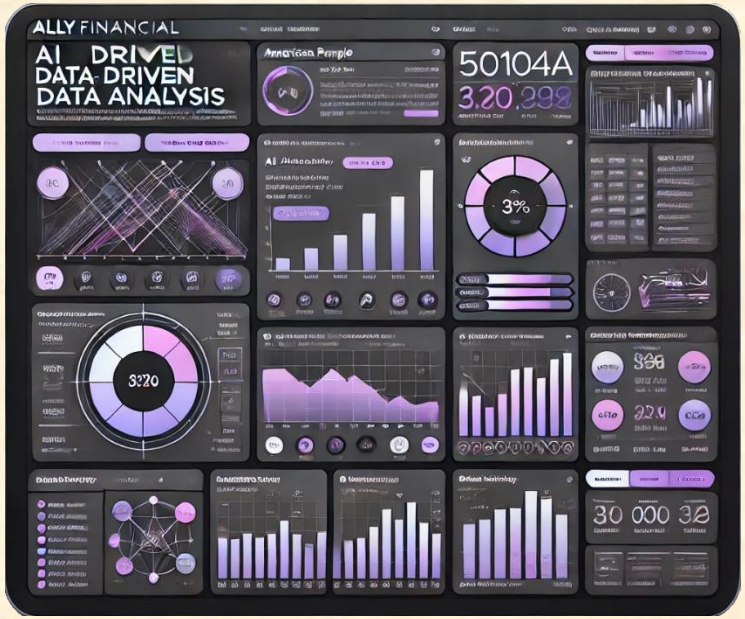
North Chicago, Illinois

Team Ally

Project Overview

Agentic Collaborator

- Functionalities
  - Increase Productivity
  - Through an All-In-One Web App
  - And AI Driven Data Analysis
- Features
  - Train a Custom Machine Learning Model
  - Analyze Data for Insights
  - Display and Visualize Data Trends
  - Generate Reports
  - Connect Employees
- Technologies
  - Python
  - Lagchain
  - React
  - Postgres



Detroit, Michigan
Charlotte, North Carolina

Team Amazon

Project Overview

Remediating AWS Security Gaps Using Generative AI

- Functionalities
  - Increasee AWS Safety
  - By Locating and Analyzing Security Gaps
  - Utilizing Machine Learning Strategies
- Features
  - Identify Security Gaps
  - Prioritize and Analyze Security Gaps
  - Give Insight on Gap Remediation
  - Design an Easy-To-Use Webapp
- Technologies
  - AWS Cloud Platforms
  - DynamoDB
  - Self-Service Security Assessment Tool
  - Machine Learning (ML)
  - Amazon QuickSight

amazon

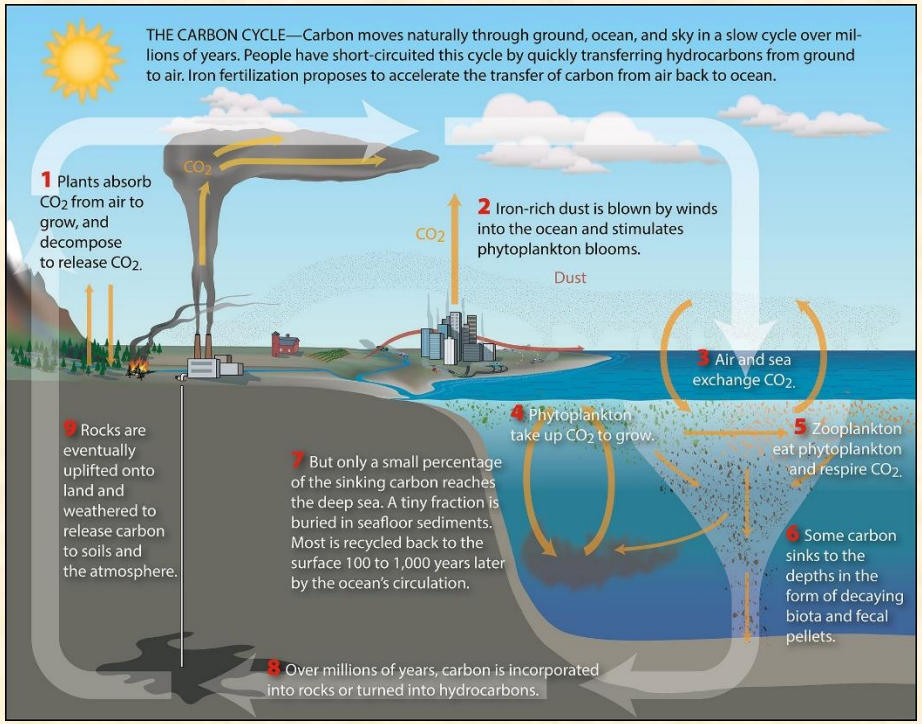
Seattle, Washington
Detroit, Michigan

Team Anthropocene Institute

Project Overview

Ocean Carbon Pollution Cleanup

- Functionalities
  - Make the Earth a Greener Place
  - By Analyzing Sensor Accuracy
  - Within a Custom Simulator
- Features
  - Gather Real Environmental Data
  - Design a Custom Simulator
  - Create Simulated Environments
  - Integrate Reading Devices in Environments
  - Calculate Reading Accuracy
- Technologies
  - Python
  - Modern Web Framework
  - Database Technologies



Anthropocene Institute

Palo Alto, California

Team Auto-Owners

Project Overview

From the Ground Up VR

- Functionalities
  - Educate Property Claims Associates
  - By Gamifying the Training Process
  - With an Interactive VR Game
- Features
  - Develop a Game to Play in VR
  - Create a Game Map Resembling a House
  - Design Floors in the House with Rooms to Explore
  - Provide Game Objectives for Players to Achieve
  - Use Objectives to Teach About Property Claims
- Technologies
  - Unity
  - Meta Quest 3 Headset

Auto-Owners INSURANCE

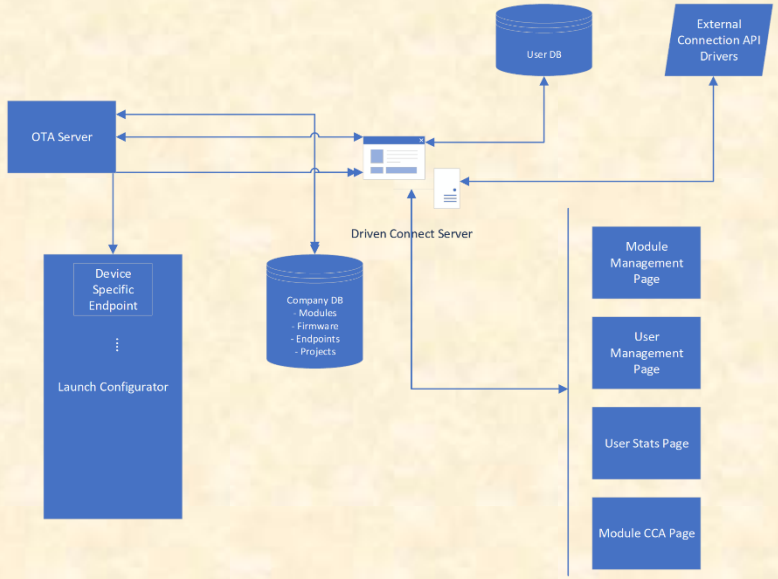
Lansing, Michigan

Team DRIVEN-4

Project Overview

DRIVEN-4 Connect Application

- Functionalities
  - Extend Capabilities of DRIVEN-4's Driven Connect
  - By Adding New and Enhanced Features
  - To the Server Application
- Features
  - Driven Connect is Used to Manage Data and Devices
  - Add New Features to Driven Connect
    - Implement Ability to Create Custom Data Dashboards
    - Redesign API Management Within System
    - Refine Database Schema
    - Integrate Stripe Payment System
    - Develop Custom Libraries from Code Bases
- Technologies
  - Python
  - Pandas
  - Java
  - Flask
  - MySQL and SQLAlchemy
  - Stripe



DRIVEN-4
St. Joseph, Michigan

Team GM RIS

Project Overview

Recycling Identification System

- Functionalities
  - Sort Recycling Automatically
  - With a Handheld Device
  - Using Plastic Identification
- Features
  - Collect Key Data
  - Manage Access with Roles
  - Provide Telemetry Data
  - Integrate Data with Centralized Database
  - Handle Communication Between Devices
- Technologies
  - Microcontroller / Single Board Computer
  - Sensors
  - Microsoft SQL Server

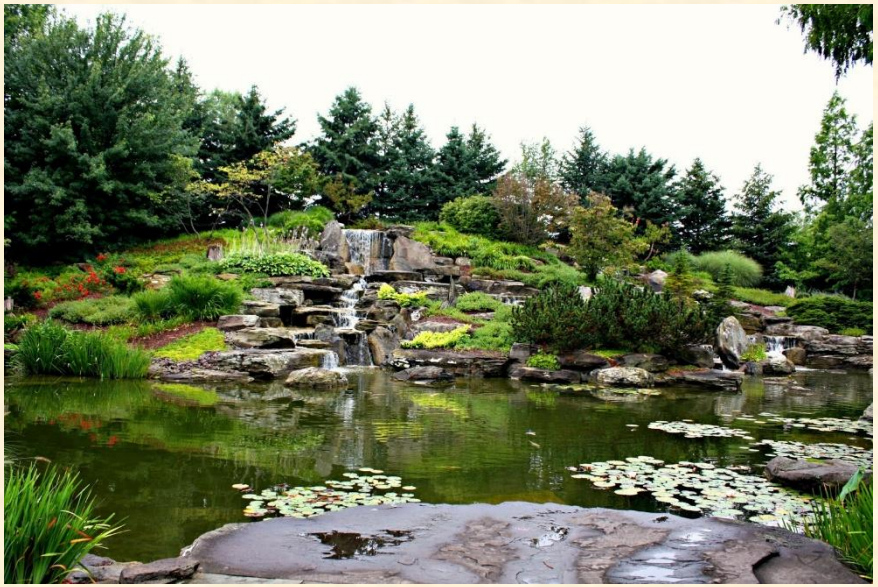
Detroit, Michigan

Team GM WHMS

Project Overview

Remote Wildlife Habitat Monitoring System

- Functionalities
  - Monitor and Identify Wildlife
  - With Audio and Visual Analysis
  - As Part of an Integrated Software Platform
- Features
  - Collect Wildlife Data with Remote Sensors
  - Convert Data into Public Database
  - Process Large Amounts of Raw Data
  - Integrate Findings with Science Projects
- Technologies
  - SQL
  - Microcontroller / Single Board Computer
  - Networking Components



Detroit, Michigan

Team HAP

Project Overview

Healthcare Payer Price Transparency

- Functionalities
  - Enhance Transparency Regarding Healthcare Costs
  - By Analyzing and Comparing Treatment Prices
  - Using Generative AI
- Features
  - Create a File Reader
  - Read Files From Hospitals and Insurance Providers
  - Collect Data About the Cost of Medical Treatments
  - Draw Insights from Data with AI
    - Compare Prices Between Medical Providers
    - Identify Areas for Improvement
- Technologies
  - ChatGPT
  - JSON File Reader

Detroit, Michigan

Team Henry Ford Innovations RSE

Project Overview

Modernizing Robotic Surgery Education

- Functionalities
  - Reduce Training Time for Surgeons
  - Using Robotic Surgery Training Data
  - Automatically
- Features
  - Provide Statistics and Suggestions for Improvement
  - Include a Dashboard for Easy Access of Data
  - Visualize Relevant Trends and Data
- Technologies
  - Med Hub
  - Intuitive
  - Microsoft Excel

HENRY FORD HEALTH
Innovations
Detroit, Michigan

Team Henry Ford Innovations RSVP

Project Overview

MSU-HFH Research Synergy Vanguard Portal (RSVP)

- Functionalities
  - Leverage MSU's Vast Research Capabilities
  - Into a Powerful Search Engine
  - To Enable Collaboration Between MSU and Henry Ford
- Features
  - Support Self-Editing of Faculty
  - Accept Inputs from Internal and Public Domains
  - Autonomously Curate Data
  - Make Recommendations for Research Collaboration
- Technologies
  - Microsoft SQL
  - Intranet
  - React

HENRY FORD HEALTH
Innovations

Detroit, Michigan

Team Kohl's

Project Overview

Governance of Expense in Kohl's Cloud Operations

- Functionalities
  - Decrease Operational Costs
  - By Tracking Google Cloud Costs
  - And Analyzing Methods to Save Money
- Features
  - Analyze Google Cloud Usage and Cost Data
  - Attribute Costs to Kohls Departments
  - Develop a Machine Learning Algorithm
  - Identify Opportunities for Cost Optimization
- Technologies
  - Google Cloud
  - Google API's
  - Google Big Query
  - Kubernetes

KOHL'S

Menomonee Falls, Wisconsin

Team Launch

Project Overview

Spatial IoT Control using Apple Vision Pro

- Functionalities
  - Quickly Interface with Home Appliances
  - Using IoT
  - And an Apple Vision Pro
- Features
  - Activate Appliances from a Distance
  - Control Thermostat and Other Settings
  - Design Robust Object Tracking
  - Support Custom Devices
- Technologies
  - Apple iPads and iPhones (iOS) / Swift
  - VisionOS
  - MQTT

Launch
by NTT DATA
Tory, Michigan

Team Magna MADO

Project Overview

Offline-Ready Mobile App for Delivery Optimization

- Functionalities
  - Improve Delivery Service
  - By Optimizing Delivery Routes and Orders
  - With a Cross-Platform Mobile Application
- Features
  - Design and Create a Mobile Application
  - Find Optimal Routes for Delivering Orders
  - Offer Real-Time Location and Status Updates
  - Construct a Dashboard to Display Live Data
  - Support Offline Capability to Avoid Service Disruption
- Technologies
  - Flutter
  - NodeJS or Golang
  - MongoDB with Realm
  - NextBillion.ai

MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team Magna TDD4ES

Project Overview

Test Driven Development for Embedded Software

- Functionalities
  - Make Test-Driven Development Simpler
  - By Creating a Testing Framework
  - Integrated as a Github Action
- Features
  - Research TDD Principles
  - Analyze Current Testing Protocols
  - Design a Testing Framework
  - Test Software and Hardware Emulators
  - Extensively Test Framework for Accuracy
- Technologies
  - C / C++ / Python
  - GNU Make
  - Github

MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team Magna VNNG

Project Overview

Visualizing Neural Network Gradients

- Functionalities
  - Improve Neural Network Training
  - By Visualizing Gradient Change
  - To Enhance Model Understanding
- Features
  - Identify Problematic Layers
  - Diagnose Training Issues
  - Show Data with Multiple Visualizations
  - Support Multiple Frameworks
- Technologies
  - PyTorch / TensorFlow
  - React
  - Vue.js

MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team Magna WFG4ADAS

Project Overview

World Feature Generation for ADAS Simulation

- Functionalities
  - Increase Automated Driving Safety
  - By Enhancing Simulation Quality
  - With Procedurally Generated Environments
- Features
  - Analyze Simulated Environments
  - Design Algorithms to Generate Environments
  - Manually Edit Simulated Environments
  - Visualize Adjustments
  - Ensure Simulation Realism
- Technologies
  - Python
  - Unreal Engine
  - Carla
  - Blender
  - BeamNG

MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team Meijer

Project Overview

Increasing Awareness of Meijer Branded Products

- Functionalities
  - Increase Customer Engagement with the Meijer Brand
  - By Promoting Meijer Products and Policies
  - With a Web Application
- Features
  - Design and Develop an eCommerce Website
  - For Customers to Buy Meijer-Owned Products
  - Offer Discounts and Promotions to Customers
  - Highlight Charity Efforts and Encourage Donating
- Technologies
  - Microsoft Azure DevOps and Web Services
  - Java or .NET
  - SQL

meijer

Grand Rapids, Michigan

Team Michigan State University CSE

Project Overview

Robotic Job Coaching

- Functionalities
  - Enhance the Virtual Job Coaching Experience
  - With Robotic Parts
  - To Better Train Workers Remotely
- Features
  - Facilitate Job Coaching Through a Single iPad
  - Automate a Queue System
  - Provide Seamless Remote Control of Robot Arm
  - Support Remote Monitoring
- Technologies
  - iOS / Swift
  - Kinovo Jaco Robot
  - Teleconferencing

East Lansing, Michigan

Team MSUFCU

Project Overview

Project Title Under Construction

- Functionalities
  - Facilitate Pick up and Drop off
  - For Bank Documents and Checks
  - Using a Self-Serve Locker System
- Features
  - Generate QR Codes Corresponding to Lockers
  - Protect Sensitive Records through Authentication
  - Service without Human Interaction
- Technologies
  - Java / Kotlin
  - HTML / CSS
  - Php
  - MySQL

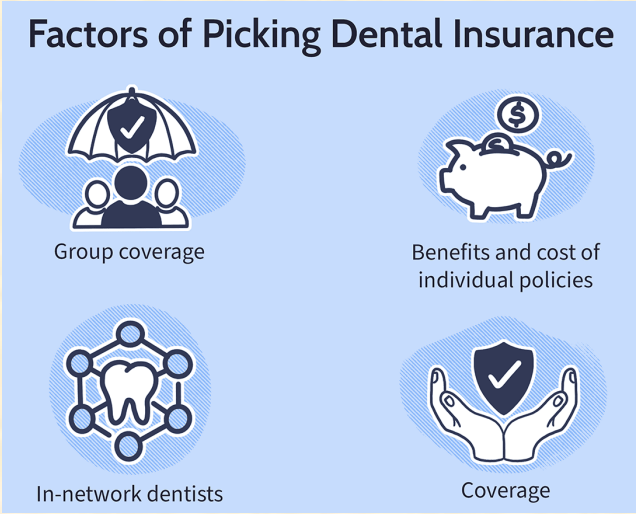
East Lansing, Michigan

Team Roosevelt Innovations Knowledge Science

Project Overview

Intelligent Benefits Parser and Knowledge Assistant

- Functionalities
  - Simplify Translation of Business Documents
  - By Extracting, Parsing, and Communicating Information
  - Using an LLM Knowledge Assistant
- Features
  - Create a Web Application
  - Users Upload Business Documents
  - Design a Document Parser to Extract and Store Information
  - Develop a Knowledge Assistant to Field Questions
  - Provide Answers to Questions About Stored Documents
- Technologies
  - Azure OpenAI
  - Angular
  - Typescript
  - Python
  - MongoDB



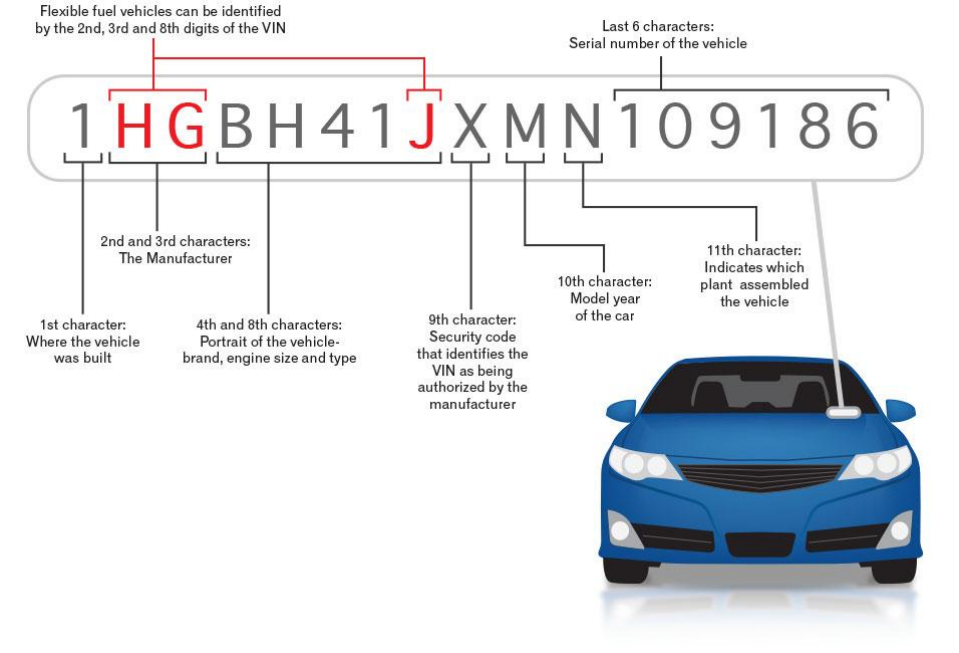
Roosevelt
simple. seamless. smart.
Okemos, Michigan

Team RPM

Project Overview

Automated VIN Integration for RPM Logistics

- Functionalities
  - Increase Workplace Productivity
  - By Locating and Analyzing Data
  - Using Machine Learning Strategies
- Features
  - Analyze Data from Multiple Sources
  - Design a Machine Learning Model
  - Parse Data for Key Data Points
  - Transform and Format Data
- Technologies
  - Microsoft Azure
  - C#
  - Python
  - .NET Framework
  - OpenAI
  - Azure AI Services



RPM

Royal Oak, Michigan

Team Stryker IST

Project Overview

Surgical OR Instruments and Needle Tracking

- Functionalities
  - Enhance Medical Patients' Safety
  - By Tracking Medical Instruments
  - With a Software Solution
- Features
  - Implement System for Tracking Surgical Instruments
  - Explore AI/ML Methods for Tracking
  - Possibility of a Hardware-Inclusive Solution
  - Design a Software Platform for a User Interface
- Technologies
  - SurgiCount Gen 3

stryker

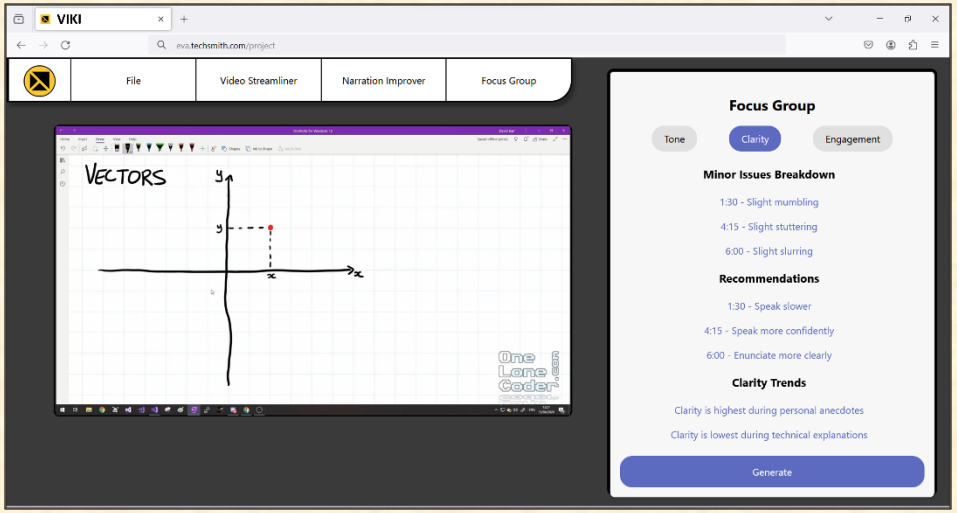
Kalamazoo, Michigan

Team TechSmith

Project Overview

Video Insight and Knowledge Interface (VIKI)

- Functionalities
  - Make Video Editing Easy
  - By Giving Users Feedback
  - Through AI Analysis
- Features
  - Analyze Videos for Key Factors
  - Develop Personas for AI Reviewers
  - Tailor Advice Based on Persona Attitude
  - Provide Users with Tips to Enhance videos
- Technologies
  - Microsoft Azure Services
  - Angular
  - React
  - Ffmpeg
  - OpenAI



TechSmith®
East Lansing, Michigan

Team Union Pacific

Project Overview

Virtual Reality Inspection Training

- Functionalities
  - Train Mechanics to Detect Defects
  - On Union Pacific Locomotives
  - With an Immersive Virtual Reality Module
- Features
  - Translate Movements to VR Input
  - Support Multiple Modules and Hardware Platforms
  - Implement Synchronization from LMS to VR
- Technologies
  - Unity Game Engine / C#
  - Meta Quest 3
  - Angular / React

BUILDING AMERICA®

Louisville, Colorado
Omaha, Nebraska

Team Urban Science

Project Overview

Predicting Automotive Sales Using Generative AI

- Functionalities
  - Increase Profitability
  - By Helping Dealers Make Decisions
  - Using Machine Learning Strategies
- Features
  - Locate Key Data Trends
  - Train a Machine Learning Model
  - Locate and Present Data Insights
  - Visualize Future Sales Predictions
  - Provide Insights to Manufacturers
- Technologies
  - Microsoft SQL Server
  - .NET Web API
  - .NET MAUI
  - Angular
  - Azure AI

URBAN SCIENCE
Detroit, Michigan

Team Vectra AI

Project Overview

AI Cyberattack Early Warning System

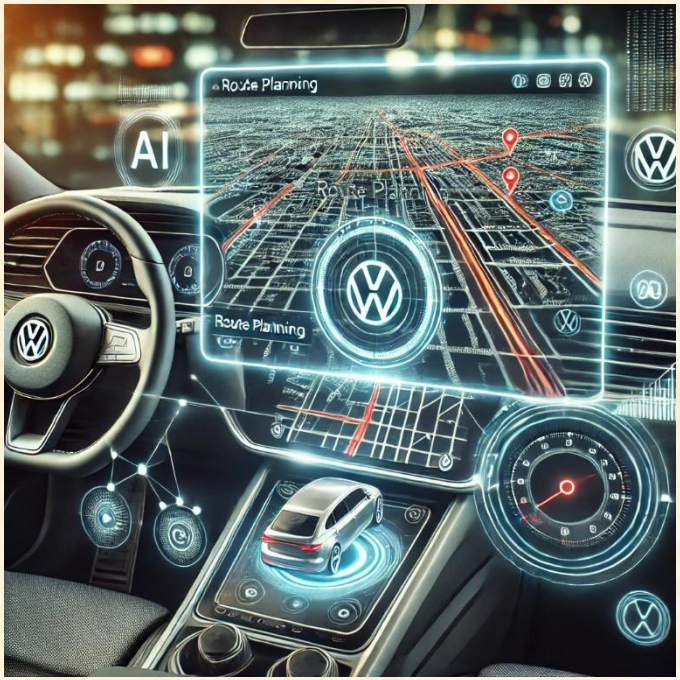
- Functionalities
  - Detect Cyberattacks Early
  - By Identifying Warning Signs
  - And Simulating All Possible Outcomes
- Features
  - Generate Simulation Configurations
  - Automatically Flag Suspicious Activity
  - Reveal Product Vulnerabilities
  - Enable AI Training with Simulation Data
- Technologies
  - Large Language Models
  - Vectra Hybrid Cyberattack Simulator

Team Volkswagen

Project Overview

Safe Journey AI

- Functionalities
  - Enhance Driver Safety
  - By Improving Route Planning
  - Using AI
- Features
  - Leverage AI to Gather and Analyze Safety Data
  - Provide Real-Time Safety Ratings and Alerts
  - Recommend Routes to Avoid High-Risk Areas
  - Suggest Safe Areas for Refueling Vehicle or Resting
  - Offer Secure Parking Options
- Technologies
  - Machine Learning Framework
  - Natural Language Processing
  - APIs and Web Scraping
  - Cloud Infrastructure
  - Backend Development
  - Frontend and UX Development



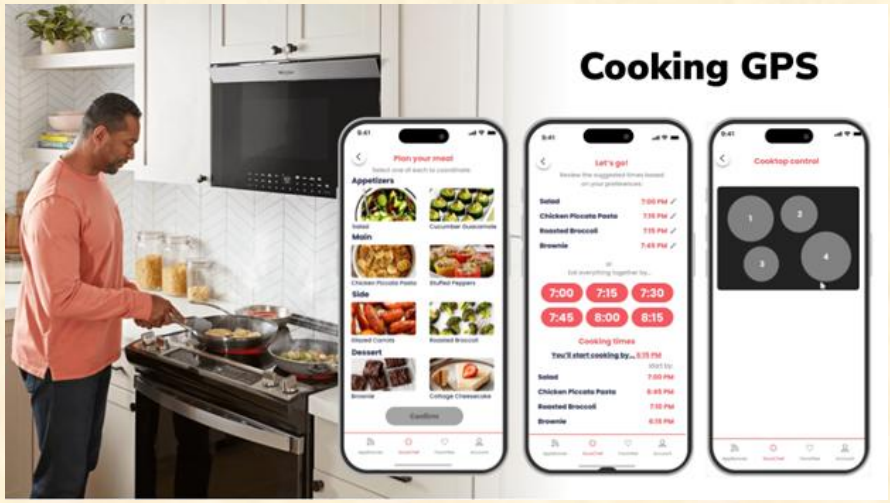
Auburn Hills, Michigan

Team Whirlpool

Project Overview

Cooking GPS

- Functionalities
  - Simplify the Process of Cooking a Meal
  - By Tracking and Planning Recipe Completion
  - Using GPS and Mobile Applications
- Features
  - Design a Mobile Application
  - Use Cooking Appliance Interfaces
  - Process Recipes for Cooking Instructions
  - Use Path Optimization to Sequence Events
  - Track User Progress During Cooking Process
- Technologies
  - Python
  - Flutter



Whirlpool

Benton Harbor, Michigan

Team WK Kellogg Co

Project Overview

Cereal Industry Analysis Tool using Generative AI

- Functionalities
  - Improve Business Models
  - By Analyzing Data About the Cereal Market
  - With a LLM
- Features
  - Investigate Annual Reports from Cereal Companies
  - Train an Open Source LLM on Report Data
  - Use Model to Investigate Industry and Competition
  - Use Model to Make Business Strategy Decisions
- Technologies
  - Amazon S3
  - Snowflake
  - Snowflake Arctic
  - R / Python

WK Kellogg Co

Battle Creek, Michigan

Attendance Today

- Open browser.
- Log into Google with MSU credentials.
- Go to www.capstone.cse.msu.edu.
- Click on…
  - + Other Links
  - > Downloads
  - First Meeting Attendance: Google Form
  - URL
    - https://shorturl.at/gY3WL
    - https://forms.gle/2Q8ga54VwJTC4oLXA

Team Member Survey [1 of 2]

- Check Student ID
- NetID
  - Yes: dyksen
  - No: dyksen@msu.edu
- Use Upper and Lower Case
  - Yes: Lansing, Michigan
  - No: LANSING, MICHIGAN
- Hometown Country, NOT County
  - Yes: USA, China
  - No: United States, Ingham, Wayne
- Use Floating-Point Numbers Only For GPAs
  - 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 (https://forms.gle/8noPfRRtXNCPP3hz6)

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? [1 of 3]

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

What's ahead?

[2 of 3]

- Team Photos
  - Coordinated by James
  - Friday, September 20, 9:00 a.m. – 5:00 p.m.
    - James will make a schedule.
    - On-Time Attendance Required
    - Put on your calendar now. ← **Note**
  - Scheduled via Google From
    - Email From James
    - Look for it.
    - Respond to it as a team ASAP.

What's ahead? [3 of 3]

- Scheduled Weekly Triage Meetings
  - Email from TM
  - Look for it.
  - When Available. Not Just When Desired.
  - Respond ASAP.
  - More On Thursday

Questions?

Capstone Overview

✓Course Logistics

✓Client Projects

➢Course Logistics (Continued)