MICHIGAN STATE UNIVERSITY

08/26, 08/28: Capstone Overview

The Capstone Experience

Dr. Wayne Dyksen
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Jared Singh Sekhon

Department of Computer Science and Engineering
Michigan State University

Fall 2025

From Students…
…to Professionals

CSE498, Collaborative Design

- "The Capstone Experience"
- Professors
  - Dr. Wayne Dyksen ("Dr. D.")
  - Dr. James Mariani ("Dr. J.")
- Team Managers (TMs)
  - Griffin Klevering
  - Jared Singh Sekhon (Sing Sec on)
  - Luke Sperling
- Class Meetings
  - Tu, Thu 3:00 – 4:20 p.m. Eastern Time
  - All-Hands:
    - 1345 Engineering Building
    - Microsoft Teams General Channel
  - Split-Hands:
    - Griffin: 2400 Engineering Building
    - Jared: 1345 Engineering Building
    - Luke: 1257 Anthony Hall
- 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.
  - Set up notifications for any email is from one of us.
  - Not noticing or reading an email from one of us will never be an excuse.

Meeting Goals for 08/26 and 08/28

- 08/26
  - Introduction to Capstone Logistics
  - Overview of Projects
  - Team Member Survey
- 08/28
  - Capstone Logistics
    - Expectations
    - Grading
  - 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 6 Students
- Build Significant Software System
  - Design
  - Develop
  - Debug
  - Document
  - Deliver
- For Project Sponsor / Client / Customer
  (Note: We'll use all three interchangeably.)
- In 15 (Short) Weeks

Course Goals

[3 of 3]

- Build a significant software system for a customer.
- Gather requirements.
- Learn new languages, tools and environments.
- Build and administer systems.
- Develop communication skills.
- Develop interview talking points.
- Learn to do stuff on your own.
- Work in a team environment.
- 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 Includess But Not Limited To…
  - Entering a Room
  - Walking to a Seat
  - Being in the Process of Sitting Down
  - Joining a Meeting
- No…
  - Using Any Electronic Devices
    - Phones
    - Laptops
    - Etc.
  - Wearing Hats or Hoods
  - Wearing Coats
  - Eating
  - Sleeping
  - Taking “Breaks”

Project Deliverables

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

See Major Milestones.

All-Hands/Split-Hands Meetings

- All-hands
  - Instructors
  - Guest Speaker(s)
- Split-Hands
  - 3 Locations
  - With Your TM
  - Team…
    - Status Reports
    - Formal Presentations
    - Project Videos

Weekly Schedule

- 08/26: Capstone Overview 1
- 08/28: Capstone Overview 2
- 09/02: Risks and Prototypes
- 09/04: Project Plan
- 09/09: Team Status Report Presentations
- 09/11: Schedule and Teamwork
- 09/16: Team Project Plan Presentations
- 09/18: Team Project Plan Presentations
- 09/23: Creating and Giving Presentations
- 09/25: Design Day Booklet Process
- 09/30: Resume Writing and Interviewing
- 10/02: Team Status Report Presentations
- 10/07: Intellectual Property
- 10/09: Team Alpha Presentations
- 10/14: Team Alpha Presentations
- 10/16: Team Alpha Presentations
- 10/21: October Break
- 10/23: Design Day and the Project Videos
- 10/28: Ethics and Professionalism
- 10/30: Team Status Report Presentations
- 11/04: Team Status Report Presentations
- 11/06: Team Status Report Presentations
- 11/11: Team Beta Presentations
- 11/13: Team Beta Presentations
- 11/18: Team Beta Presentations
- 11/20: Team Beta Presentations
- 11/25: Team Status Report Presentations
- 11/27: Thanksgiving
- 11/30: Project Videos Due
- 12/02: Project Videos
- 12/03: All Deliverables Due
- 12/04: Project Videos
- 12/04: Design Day Setup (12:30 p.m. – 3:00 p.m.)
- 12/05: Design Day
- 12/10: Capstone Wrap Up (10:00 a.m. – 1:00 p.m.)

The Capstone Labs

- 3340EB, 3352EB, 3358EB
- Door Lock
  - Electronic Keypad
  - Code = ########
  - Do Not Give Out to Other Students
- Systems
  - Up to Three per Team
    - Two 27” iMacs
    - Optional DECS Virtual Machine
  - Team 100% Responsible
    - Building
    - Maintaining
    - Securing
    - Backing Up
- 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
  - Microwave
- Lockable Storage
  - At Most One Drawer Per Team
  - Only As Needed
  - Assigned by Instructors
  - 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 TMs
- Meeting Times TBA With
  - Team
  - Client
  - TMs
- Students must be available to meet in person on any day MSU is in session.
  - Team Meetings
  - Triage Meetings
  - Client Conference Calls
- Schedule Accommodations
  - Made For Reasonable Requests for Class and Work Schedules
  - Not Made For
    - Personal Travel
    - 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]

- Sponsors/Clients
  - Vary in Size and Type
  - Sponsor/client contacts are “volunteers.”
- Team Contact Person
  - Picked By Team
  - Main Point of Contact for Client
  - Must Be Responsible Person

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 Proposal 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 Dr. J. For Questions.
- Not Willing to Sign May Affect Project Choice

Project Teams

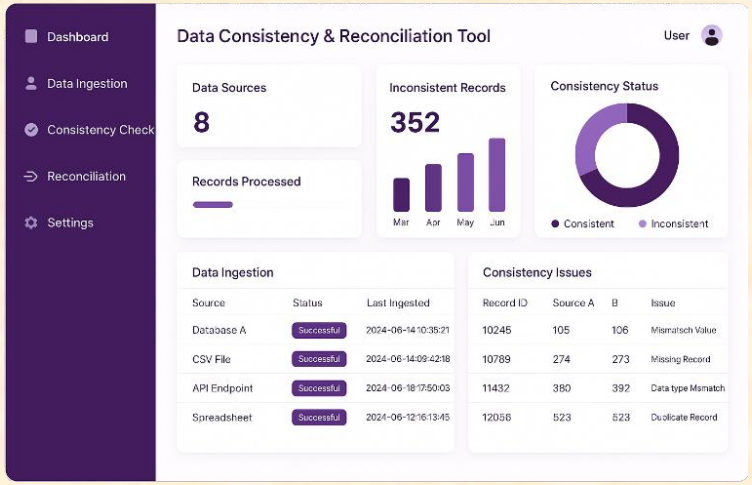
1. Ally
2. Amazon
3. Anthropocene Institute
4. Auto-Owners
5. Corewell Health
6. Delta Dental AIRMG
7. Delta Dental IQA
8. GM
9. HAP
10. Henry Ford Innovations eLUG
11. Kohl's
12. Launch
13. Ludus
14. Magna AI4CBM
15. Magna LLM3DMID
16. Magna VRAI4MI
17. McKesson
18. Meijer
19. Michigan State University CSE
20. Michigan State University Law
21. MSUFCU
22. NetJets
23. PACE
24. Stryker IST
25. TechSmith
26. Union Pacific
27. Urban Science
28. UWM
29. Vectra AI
30. Whirlpool

Team Ally

Project Overview

Data Consistency and Reconciliation Tool

- Functionalities
  - Improve Reliability of Distributed Data
  - Through an End-to-End Data Pipeline
  - Utilizing a Cloud-Data Warehousing Platform
- Features
  - Develop a Modular Data Ingestion System
  - Utilize AI for Consistency and Validity Checking
  - Implement an Auditing and Reconciliation System
  - Build Customizable and Interactive Dashboards
  - Design UI and Role-Based Mechanisms
- Technologies
  - Data Warehousing Platform
  - Python
  - ML libraries
  - React or Angular



ally

Detroit, Michigan
Charlotte, North Carolina

Team Amazon

Project Overview

Seller Agent Management Platform

- Functionalities
  - Improve Efficiency for Amazon Sellers
  - With Customized AI Agents
  - Integrated with an Intuitive Web App
- Features
  - Build AI Agents to Assist Sellers
  - Interface With Slack API for Agent Communication
  - Design Autonomous Agent Runtime…
  - To Enable Continuous Operation of Agents
- Technologies
  - AWS EC2 /S3 / ECS
  - AWS Bedrock
  - AWS CloudWatch
  - LWA + Oauth
  - Slack API

amazon

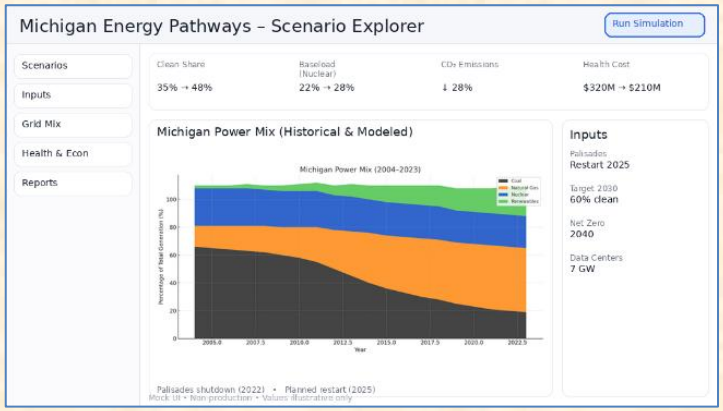
Seattle, Washington
Detroit, Michigan

Team Anthropocene Institute

Project Overview

Modeling Michigan's Energy Future

- Functionalities
  - Promote Nuclear Energy
  - By Creating a Model to Analyze Benefits
  - Hosted on an Interactive Web Application
- Features
  - Create Sophisticated ML Models
    - Using Electricity Mix Data
    - Analyzing Health And Economic Impacts of Nuclear Plant Shutdown
    - Extrapolate the Benefits of Restarting a Nuclear Plant
  - Deploy a Web-Application for Displaying Information
- Technologies
  - AI Tools
  - SQL or another Database Language
  - Front End Development Tools



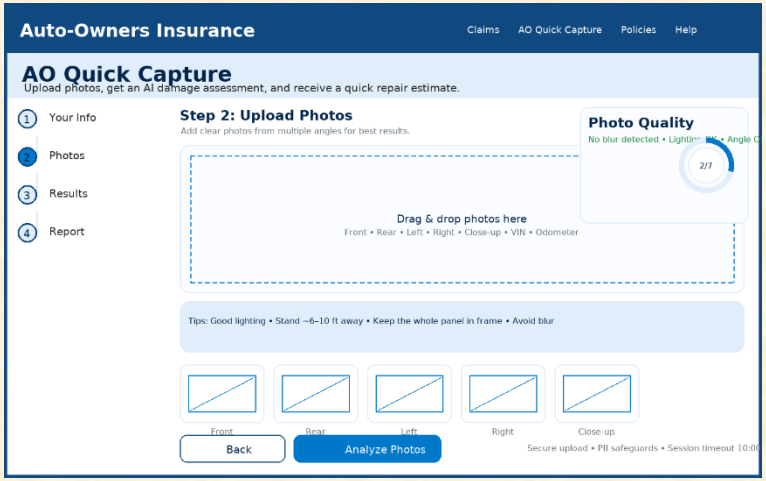
Anthropocene Institute
Palo Alto, California

Team Auto-Owners

Project Overview

AO Quick Capture

- Functionalities
  - Quickly Estimate Repair Costs for Automobile Accidents
  - By Analyzing User Uploaded Photos
  - Through a Web-Application with Chatbot Support
- Features
  - Implement a Dropbox User Information and Photos
  - Utilize Machine Learning Tools for Analysis
    - Damage-Type
    - Area
    - Confidence Level, etc.
  - Build Cost-Estimate Reporting System
- Technologies
  - Microsoft SQL Server
  - Java Spring Boot 3 RESTful API
  - Map APIs
  - Machine Learning Models



Auto-Owners INSURANCE

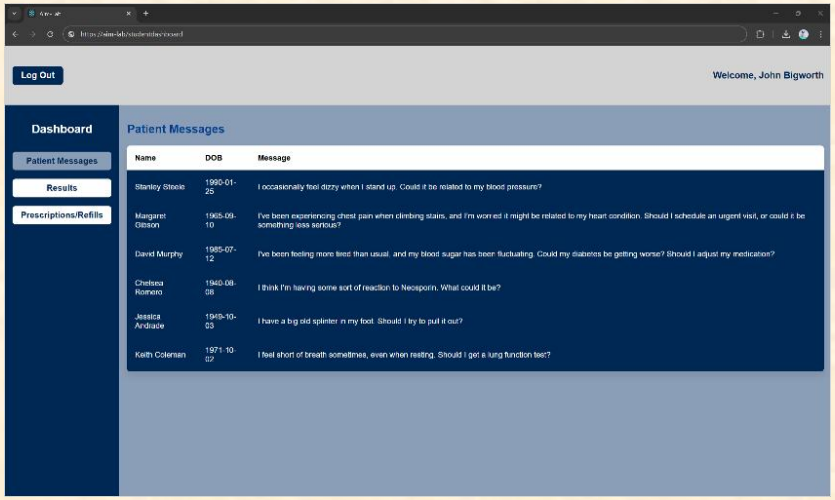
Lansing, Michigan

Team Corewell Health

Project Overview

An AI Tool to Learn Management of Patient Messages

- Functionalities
  - Enhance Medical Service
  - By Training Medical Students
  - Through an Intuitive Web App
- Features
  - Enhance the Existing Training System
    - Create Fake Pediatric Patients
    - Integrate a Medication Ordering System
  - Identify Trends in Student Responses to Patients
  - Develop Realistic Practice Exams
- Technologies
  - Machine Learning Technologies
  - Web Development Tools



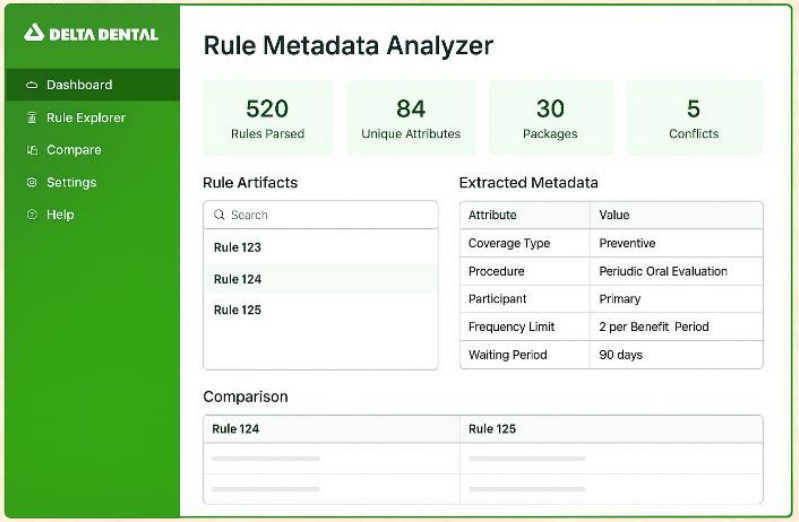
Corewell Health™
Grand Rapids, Michigan

Team Delta Dental AIRMG

Project Overview

AI Rule Metadata Generator

- Functionalities
  - Streamline Rules Process for Claims
  - Utilizing AI Tools for Generating Rule Metadata
  - With an Angular Application
- Features
  - Build an AI Platform for Rule Metadata Generation
  - Test Efficacy of Various LLMs for Rule Analysis
  - Implement User Rule-Manipulation System
- Technologies
  - Angular
  - Bootstrap 5 CSS
  - Java Quarkus
  - SQL
  - Large Language Models



DELTA DENTAL®

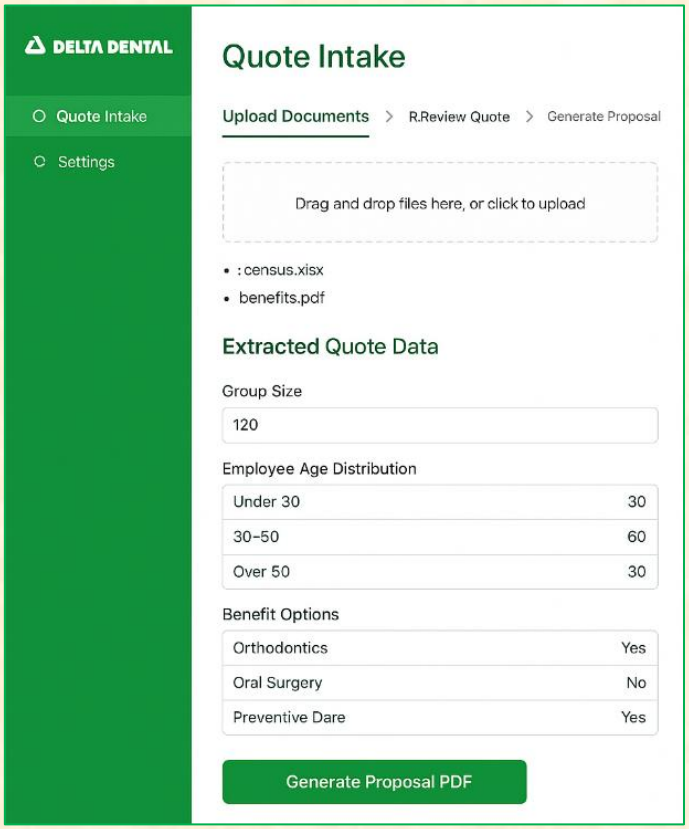
Okemos, Michigan

Team Delta Dental IQA

Project Overview

Insurance Quoting Assistant

- Functionalities
  - Improve Distributed Data Gathering
  - By Utilizing AI Analysis for Dictionary Generation
  - On an Angular Application
- Features
  - Implement a Multimodal AI Platform
  - Train AI Platform on a Given JSON format
  - Create a Database for Persistent Quote Storage
  - Develop PDF Generator from JSON quote
- Technologies
  - Angular
  - Bootstrap 5 CSS
  - Java Quarkus
  - MongoDB
  - Large Language Models



DELTA DENTAL®

Okemos, Michigan

Team GM

Project Overview

Habitat Identification Using Drone Imaging

- Functionalities
  - Identify and Log Flora Species
  - Using Drone Imagery and AI for Identification
  - Built in a Data Management Platform
- Features
  - Create an AI Tool for Identifying Flora
  - Develop a Data Storage and Management Platform
  - Use QR Codes for Data Entry/Manipulation
  - Use a Relational Database for Storage
    - Dates
    - Time
    - GPS Location
    - Species identification, etc
- Technologies
  - Web Server
  - SQL
  - ML for Image Identification

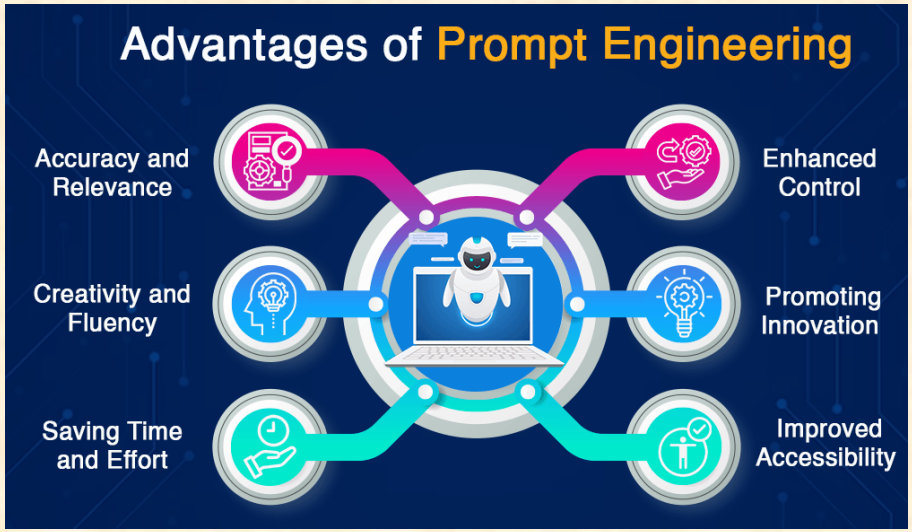
Detroit, Michigan

Team HAP

Project Overview

Prompt Assistant: Mastering the Art of Prompt Engineering

- Functionalities
  - Build Better LLM Prompts
  - To Improve Employee Efficiency
  - Using an Interactive Interface
- Features
  - Provide Templates for Similar Prompts
  - Evaluate Prompt Effectiveness
  - Offer a Step-by-Step Prompt Creation Tool
- Technologies
  - CSS / HTML
  - Microsoft SQL Server
  - UI / UX Expertise



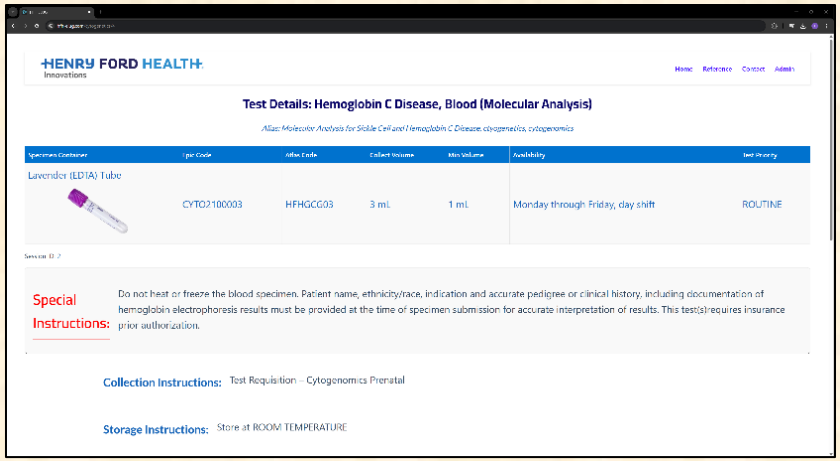
Detroit, Michigan

Team Henry Ford Innovations eLUG

Project Overview

Electronic Laboratory User's Guide (eLUG) 2.0

- Functionalities
  - Modernize an Electronic User Guide
  - With Modern Features
  - To Expedite Patient Treatment
- Features
  - Convert Current System to a Web-based Structure
  - Facilitate Easy Sharing
  - Standardize Formats
  - Provide a Mobile Application
- Technologies
  - CSS / HTML
  - React
  - Microsoft SQL



HENRY FORD HEALTH® Innovations

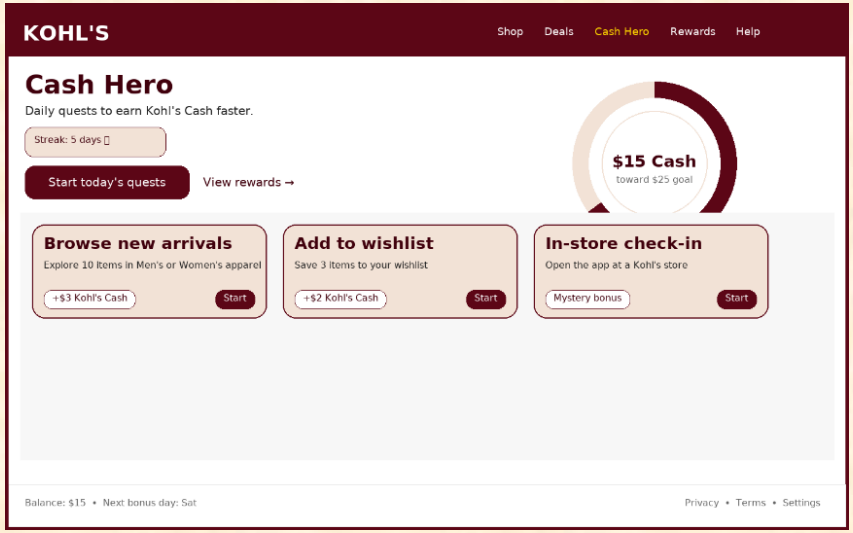
Detroit, Michigan

Team Kohl's

Project Overview

Kohl's Cash Hero

- Functionalities
  - Drive Sales with Young People
  - By Improving the Online Shopping Experience
  - Through Gamification of Kohl's Web Store
- Features
  - Offer Dynamic Promotions
  - Support Daily Deals and Bonuses
  - Develop Autonomous Data Collection…
  - And Data Analysis With Dashboards
  - Provide Robustness Against Attacks/Spam
- Technologies
  - React
  - Spring Boot
  - Java



KOHL'S

Menomonee Falls, Wisconsin

Team Launch

Project Overview

My VR Language Tutor

- Functionalities
  - Teach Foreign Languages
  - Through Cutting Edge AI and ML
  - With an Immersive Virtual Reality Application
- Features
  - Design Immersive Real-world Environments
  - Implement Conversational AI
  - Provide Help when User is Stuck
  - Support Multiple NPCs at Once
  - Grade Users on Ability to Read Signs
- Technologies
  - Unity / C#
  - Large Language Models / GenAI
  - Oculus Headset
  - Natural Language Processing

Launch
by NTT DATA
Tory, Michigan

Team Ludus

Project Overview

Web-Based FGL Ticket Emulator & Interpreter

- Functionalities
  - Modernize Development Process for Boca Printers
  - By Implementing an Emulator for FGL Code
  - Hosted on a Web-based Platform
- Features
  - Develop Functionality for Live FGL Results Preview
  - Design UI for Ticket Previews
  - Implement Downloading and Printing Previews
  - Create JavaScript API for Easy Integration
  - Build and Host a Web Platform for Emulation
- Technologies
  - JavaScript or TypeScript
  - HTML/CSS
  - Canvas or SVG

Ludus

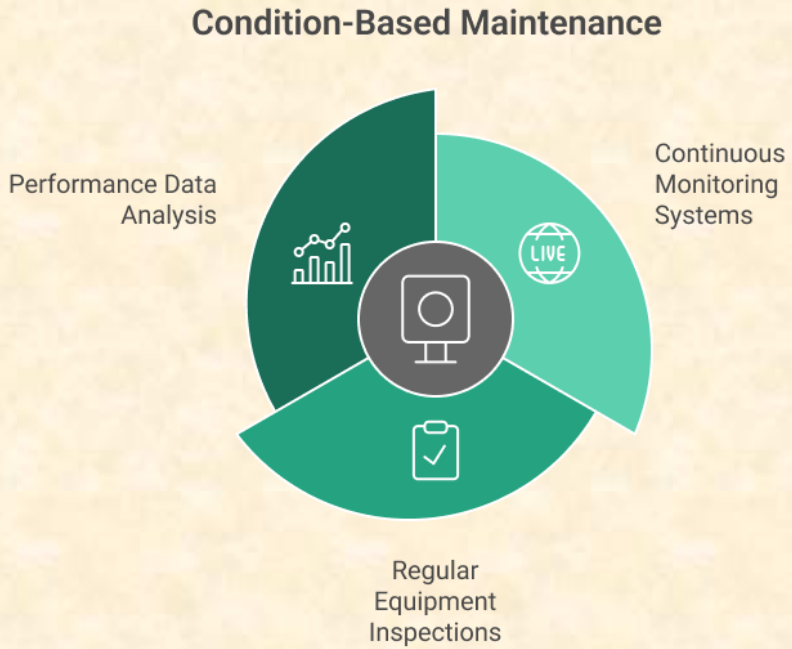
Holland, Michigan

Team Magna AI4CBM

Project Overview

ML/AI Pipeline for Condition-Based Maintenance

- Functionalities
  - Improve Industrial Efficiency
  - By Predicting when Maintenance is Needed
  - Before Machinery Failure Occurs
- Features
  - Collect and Preprocess Automotive Data
  - Implement Multiple Models
    - Collect Raw Dataset
    - Clean Data
    - Exploratory Data Analysis
  - Deploy and Visualize Results from Models
- Technologies
  - Robot Operating System 2
  - Python
  - MQTT



MAGNA

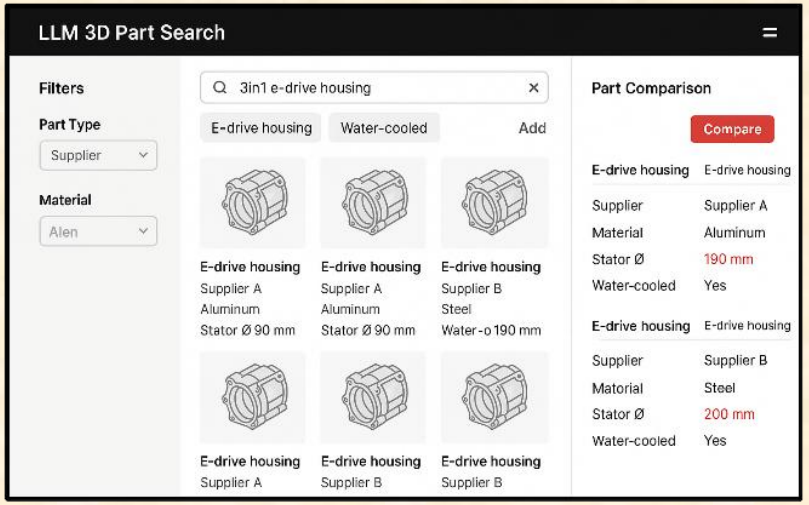
Tory, Michigan
Aurora, Ontario, Canada

Team Magna LLM3DMID

Project Overview

LLM 3D Model Interpretation & Decomposition

- Functionalities
  - Compare Variants of Auto Parts
  - To Identify Advantages of Each
  - Working Closely with 3D Parts Models
- Features
  - Explode 3D Models into Parts…
    - To Compare Against Other Parts
    - Compare Pieces in Terms of Many Factors
  - Develop Semantic Search for Parts
  - Compute Similarity Scores
- Technologies
  - CAD
  - CSS / HTML
  - Python
  - MCP Server
  - Agentic AI



MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team Magna VRAI4MI

Project Overview

VR Human-AI Multimodal Interaction

- Functionalities
  - Edit CAD Models in VR
  - With Gestures and Voice Recognition
  - To Facilitate Easier Design
- Features
  - Interface with AI Model
  - Accept LLM-style Commands
  - Support Gesture and Voice Combinations
  - Export CAD Models for Use in Other Projects
  - Offer Insights and Annotations
- Technologies
  - Meta Quest 3
  - Large Language Models

MAGNA

Tory, Michigan
Aurora, Ontario, Canada

Team McKesson

Project Overview

Intelligent Network Security for High-Risk Traffic

- Functionalities
  - Protect Sensitive Medical Data
  - By Developing a Risk-aware Firewall
  - With a Web App to Manage Firewall Deployment
- Features
  - Develop a Firewall Rule Risk Rating Engine
  - Monitor Rule Usage and Risks Over Time…
  - With an Intuitive Dashboard
  - Automate Notifications and Audits
  - Analyze Policy Compliance Autonomously
- Technologies
  - NIST Cybersecurity Framework
  - NIST SP 800-41
  - PowerBI
  - Choice of Database Technologies

McKESSON

Tyler, Texas

Team Meijer

Project Overview

Environmental Awareness with BeBot

- Functionalities
  - Increase Engagement in Environmental Initiatives
  - By Integrating BeBot and Pixie Drone Data
  - Into a Public Facing Interactive Web-Platform
- Features
  - Create a Web-Platform for Public Use
  - Design Real-Time Data Dashboards and Maps
  - Implement Downloadable Educational Modules
  - Implement Gamification, Social Sharing and Sign-Ups
  - Utilize AI for Image Classification
- Technologies
  - Microsoft Azure Web Platform
  - Java / .Net / SQL
  - Machine Learning Tools

meijer®

Grand Rapids, Michigan

Team Michigan State University CSE

Project Overview

Remote Interface for Small-Scale Autonomous Racecars

- Functionalities
  - Improve Autonomous Driving Efficiency
  - By Gathering Data for Training
  - On a Small-Scale Replica Vehicle
- Features
  - Enhance Current Small-Scale Vehicle Software
  - Integrate Sensor Components on Real Hardware
  - Design Visualizations for Sensor Readability
  - Implement Offline Mapping Support
  - Control Multiple Vehicles Remotely
- Technologies
  - Robotics and Automation Middleware (ROS2)
  - Linux / Ubuntu
  - Python / C++
  - Containerization

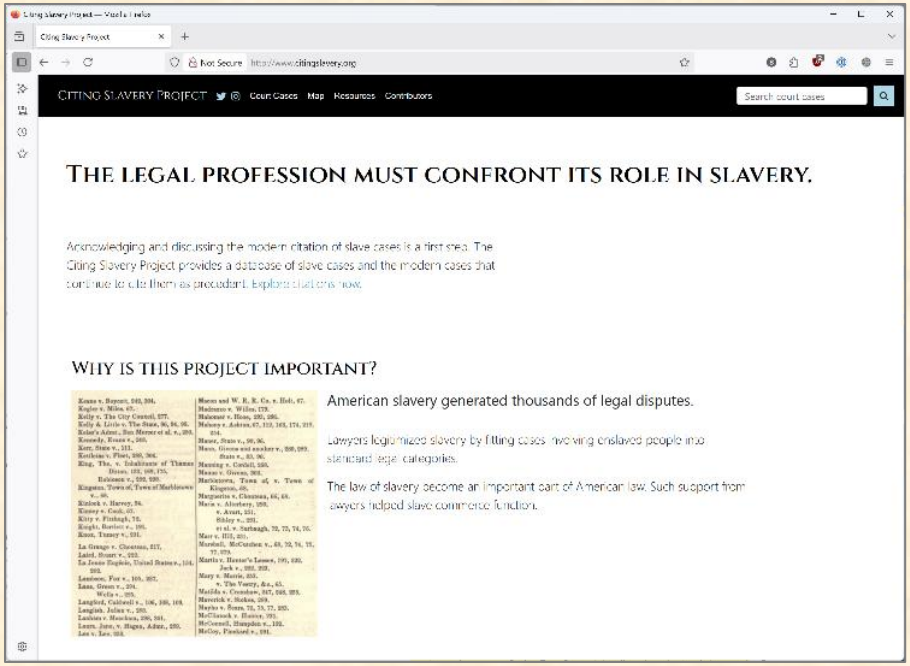
East Lansing, Michigan

Team Michigan State University Law

Project Overview

Citing Slavery Data Presentation

- Functionalities
  - Streamline Research
  - By Making Historic Slavery Data Accessible
  - Through an Intuitive Web App
- Features
  - Design an Easy-To-Use Web App
  - Integrate With Citing Slavery Database
  - Display Historic Court Cases
  - Develop Court Case Search Functionality
    - Full-Text Search
    - Search Based on Meta Data
  - Detect and Flag False Citation Information
  - Describe Trends with Visualization or AI Insights
- Technologies
  - Ruby
  - JavaScript
  - PostgreSQL
  - CourtListener API



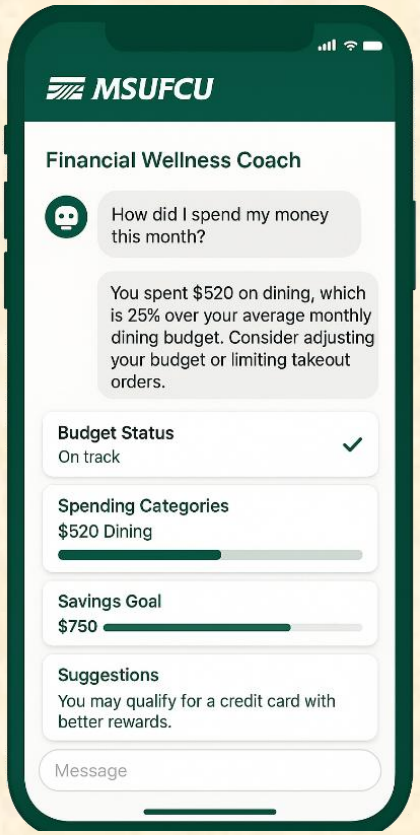
East Lansing, Michigan

Team MSUFCU

Project Overview

AI-Powered Financial Wellness Coach

- Functionalities
  - Provide Member-Tailored Financial Coaching
  - Through an AI Assistant
  - Hosted on a Mobile and Web Application
- Features
  - Build a Financial AI Assistant for User Interaction
  - Integrate a Model Context Protocol (MCP) Server
  - Implement Contextual Financial Guidance Abilities
- Technologies
  - Authentication Technologies
  - NLP / AI tools
  - React
  - Node.js or Python Frontend Libraries
  - MCP Server Middleware



msufcu

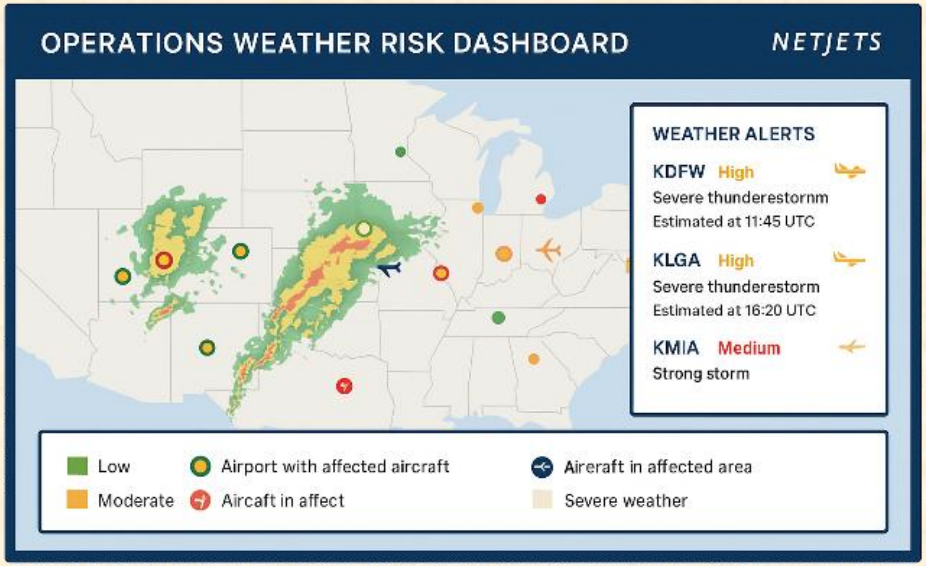
East Lansing, Michigan

Team NetJets

Project Overview

Weather Monitoring and Impact Assessment

- Functionalities
  - Increase Airline Efficiency
  - By Monitoring Environmental Conditions
  - Through an Easy-To-Use Web App
- Features
  - Design a Custom Web Application
  - Analyze Real-Time Weather Data
  - Illustrate Key Weather Insights
    - Which Aircrafts will be Affected by Weather
    - Determine Time of Impact
  - Visualize Historic Weather Data
  - Identify At-Risk Grounded Airplanes
- Technologies
  - AWS Platform



NETJETS®

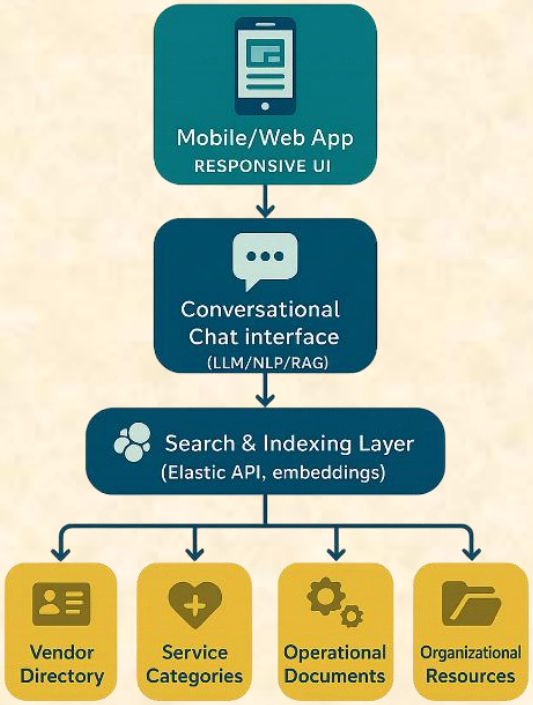
Columbus, Ohio

Team PACE

Project Overview

AI Services & Vendor Navigator

- Functionalities
  - Improve the Quality of Elder Care
  - By Assisting Care Personnel
  - Through an AI Powered Application
- Features
  - Design a Custom Web and Mobile App
  - Develop a Searchable Database
  - Integrate an AI Chatbot For Easy Querying
  - Implement Secure, Role Based Authorization
  - Create an Admin Portal for Data Insights
- Technologies
  - Python
  - PostgreSQL
  - OpenAI API
  - React Native or Flutter



PACE SOUTHEAST MICHIGAN

Detroit, Michigan

Team Stryker IST

Project Overview

Clean & Sterilized Instrumentation

- Functionalities
  - Track Reusable Medical Equipment
  - To Prevent Reuse of Contaminated Tools
  - In a Web Application
- Features
  - Integrate Electronic Medical Records
  - Handle Each Step of the Tools' Usage
  - Build on Existing System
    - Improve Project From Last Semester…
    - Add New Features
    - Optimize Solution
- Technologies
  - CSS / HTML / JavaScript
  - Swift

stryker

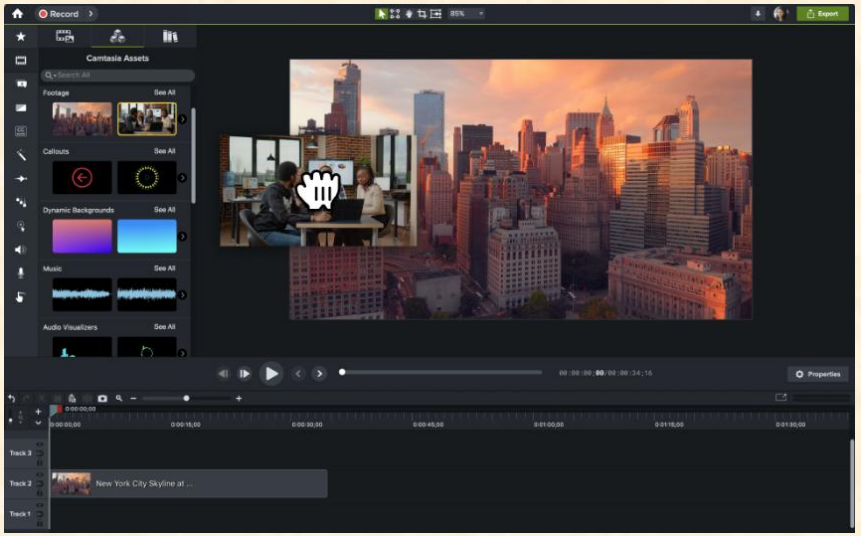
Kalamazoo, Michigan

Team TechSmith

Project Overview

Insight Weaver AI (IWAI)

- Functionalities
  - Streamline Video Creation
  - By Dynamically Cutting and Integrating Clips
  - Utilizing Custom AI Models
- Features
  - Develop an Intuitive Web App
  - Ingest Video Clips of Differing Formats
  - Create Custom AI/ML Models
  - Correlate Video Clips together
  - Display Combined Video Clip Previews
  - Dynamically Generate Video Based on Context
- Technologies
  - Microsoft Azure Services
  - React
  - Ffmpeg
  - Openal



TechSmith®
East Lansing, Michigan

Team Union Pacific

Project Overview

Cars in the Clear VR Training

- Functionalities
  - Help Train Mechanics to Identify Safety Risks
  - While Enabling Realistic Risk Resolution
  - With a VR Training Simulator
- Features
  - Simulate a Variety of Real-World Scenarios
    - Safety Risks
    - Operational Disruptions
    - Distractions, etc.
  - Automatically Grade Performance
  - Provide Freedom to Interact and Learn
  - Model Many Configurations
- Technologies
  - Unity / C#
  - Meta Quest 3

UNION PACIFIC

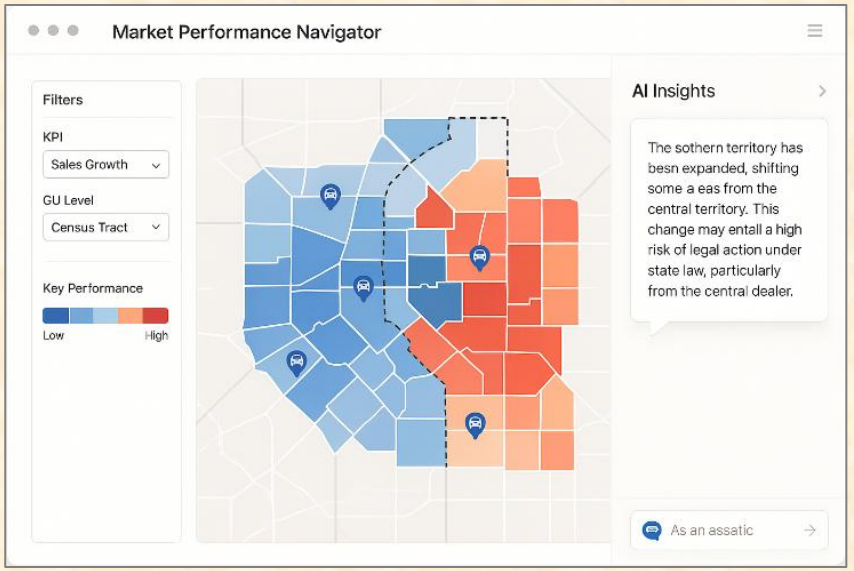
BUILDING AMERICA®

Louisville, Colorado
Omaha, Nebraska

Team Urban Science

Project Overview

Generating Mapping Insights Using AI



- Functionalities
  - Improve Dealer Efficiency
  - By Performing Geographic Market Analysis
  - Within an Attractive Web App
- Features
  - Design an Easy-To-Use Web App
  - Integrate a Custom Database
  - Analyze Geographic Market Data
  - Visualize Market Trends on a Map
  - Alter and Edit Dealership Data and Location
  - Design an LLM To Explain Legal Factors of Dealership Locations
- Technologies
  - Microsoft SQL Server
  - Angular
  - Azure OpenAI
  - Azure AI Foundry Agent Service

URBAN SCIENCE
Detroit, Michigan

Team UWM

Project Overview

IT Goals Dashboard

- Functionalities
  - Increase Employee Productivity
  - By Making it Easier to Track Goals and Results
  - Within an AI Powered Dashboard
- Features
  - Improve Existing UWM Software
  - Track Department Goals and Results
  - Visualize Progress Via Different Metrics
  - Integrate a Robust Administrator System
  - Develop Machine Learning Models
  - Perform Predictive Analysis to Optimize Strategies
- Technologies
  - C#
  - REACT
  - Azure SQL Server
  - REST API

UNITED WHOLESALE MORTGAGE

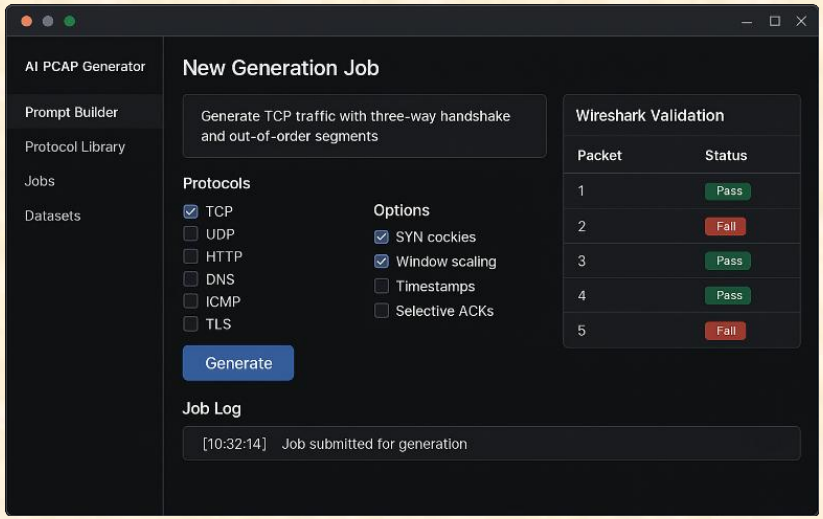
Pontiac, Michigan

Team Vectra AI

Project Overview

Packet Forge: AI Network Protocol Engine

- Functionalities
  - Improve Security Detection Algorithms
  - Utilizing AI Tools for Realistic Packet Generation
  - Incorporated in a Validation Platform
- Features
  - Configure AI Platform for Packet Generation
  - Implement Parameter-Specific Packet Simulation
  - Validate Packets by Wireshark Analysis
- Technologies
  - Large Language Models
  - Protocol Parsing
  - Wireshark



VECTRA®

San Jose, California

Team Whirlpool

Project Overview

Intelligent Recognition and Inventory System (IRIS)

- Functionalities
  - Improve Household Environmental Friendliness
  - By Tracking and Managing Food Quantities
  - Using Video Recognition
- Features
  - Ensure Users Only Buy What's Needed…
  - To Minimize Food Waste
  - Distinguish Between Loading and Unloading
  - Identify Individual Food Items
  - Crop out Body Parts and Obstructions
  - Process Video in Real-time
- Technologies
  - Python
  - CSS / HTML

Whirlpool

Benton Harbor, Michigan

Attendance Today

- Get out your laptops.
- 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/wXoUS
    - https://forms.gle/psodkKJh7HcC61me9

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: 3.1415926, 3.5-3.7, ~3.5, About 3.5

Team Member Survey [2 of 2]

- 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/jENao7eZoHHwRAKF9)

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 will be given in emailed project proposals.
    - Instructors will email iMac 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 Dr. J.
  - Friday, September 19, 9:00 a.m. – 5:00 p.m.
    - Every Team Member Required to Attend
    - On-Time Attendance Required
    - Put on your calendar now. ← Note
  - Scheduled via Google From
    - Email From Dr. J.
    - Look for it. Respond to it as a team ASAP.
    - Give Times When Available. Not Just When Desired.

What's ahead? [3 of 3]

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

Questions?

Capstone Overview

✓Course Logistics

✓Client Projects

➢Course Logistics (Continued)

Where are we?

- Teams/Projects
  - Assigned
  - Met and Working
- Sponsors/Clients
  - Contacted
  - Scheduled Weekly Meeting
  - Met With Once?
- Luke, Griffin and Jared
  - Heard From
  - Scheduled Weekly Triage Meeting
  - Met With Once?
- Capstone Lab
  - Found It
  - Successfully Logged into Systems and Changed Passwords
  - Began Configuring Systems
- Projects
  - Studying Project Description
  - Exploring and Configuring Technologies
  - Exploring and Configuring Systems
  - Discussed with Client

About Us

[1 of 2]

- Dr. D.
  - Title: Professor of Computer Science and Engineering
  - Hometown: North Haledon, New Jersey

  - Education: Calvin College (BS), Purdue University (MS, PhD)
  - Experience: Professor @ Calvin, Purdue, MSU
- Dr. J.
  - Title: Professor of Instruction
  - Hometown: Sterling Heights, Michigan
  - Education: MSU (BS, MS, PhD)
  - Experience: CSE498 Grad, Teaching Assistant, Professor @ MSU

About Us

[2 of 2]

- Luke Sperling
  - Title: Graduate Teaching Assistant
  - Hometown: Birmingham, Michigan
  - Education: MSU (BS, MS, PhD Candidate)
  - Experience: CSE498 Grad, Teaching Assistant @ MSU
- Griffin Klevering
  - Title: Graduate Teaching Assistant
  - Hometown: South Lyon, Michigan
  - Education: MSU (BS, MS, PhD Candidate)
  - Experience: CSE498 Grad, Teaching Assistant @ MSU
- Jared Singh Sekhon
  - Title: Graduate Teaching Assistant
  - Hometown: Kuala Belait, Belait, Brunei Darussalam
  - Education: MSU (BS, MS, PhD Candidate)
  - Experience: CSE498 Grad, Teaching Assistant @ MSU

Capstone TM Nomenclature

In the spirit of running like a business…

- ~~Teaching Assistant or TA~~
- Team Manager or TM
  - Not Traditional TA Role
  - Not a Tutor
  - Luke, Griffin, Jared == TM
- Dr. D. and Dr. J.
  - TMs' Managers
  - Your…
    - Manager's Managers
    - "Skip-Level" Managers

Capstone Lab Machines

- Depends on Team Needs
  - Two 27” iMacs
  - Optional
    - DECS VM (Servers)
    - PC (Wintel)
- Operating Systems on iMacs
  - Run Latest macOS
  - Install VMware Fusion 13 (It’s free.)
  - Create Virtual Machines
    - Windows 11 VM from Instructors
    - Allocate Sufficient Cores and Memory
    - Others as Needed
  - Do not use Apple Boot Camp

The Capstone Labs

[1 of 2]

- 3340EB, 3352EB, 3358EB
- Security
  - Keep lab doors closed. ← **Note**
  - Do not…
    - …open doors for strangers.
    - …give out the door key code to others.
    - …invite non-capstone students to work in the lab with you.
- Game Playing / Video Watching
  - Not On Monitors Facing Hallway
  - Not If Other Team Members Need Machine

The Capstone Labs

[2 of 2]

- 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 microwave 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.
- Be careful with cabinet drawers; don’t “maniac” them.
- Water Dispensers (Cooler and Fridge) are not connected to a drain.

Devices From MSU

- For Capstone Project Use Only
- By Team for the Semester
- Includes “General Purpose” Devices
  - iOS
    - iPads
    - iPhones
  - Android
    - Tablet
    - Phone
  - Surface Pro
  - Meta Quest 3
  - Something Else
- How do you get them?
  - Ask Dr. J and/or TM
  - Pick Them Up from Dr. J and/or TM

If you need something, ask.

For starters, use emulators.

Devices From Project Sponsors

- Special Purpose Devices
  - Apple Vision Pro
  - Quest
  - iOS or Android Device
  - NVIDIA Jetson
  - Drone
  - Raspberry Pi
  - Etc…
- How do you get the devices?
  - Ask sponsor to ship to Dr. D. at MSU (USPS Address on Website. > Contact Us)
  - Pickup from Dr. J. and/or TMs
- Where do you keep the devices?
  - In Capstone Lab
  - Locked Cabinet
- How do you return the devices?
  - Return to Instructors
  - Ship via UPS, USPS,…

Software

- From MSU
  - macOS / Sequoia
  - Windows 11
  - Office 365
  - MSU Git
- From Sponsor
  - Special Software
  - Cloud Computing

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 > Weekly Schedule
- Schedules > Major Milestones
  - 09/09: Status Report Presentations
  - 09/16,18,23: Project Plan Presentations
  - 10/09,14,16: Alpha Presentations
  - 11/22,23: Beta Presentations
  - 22/28,20: Beta Presentations
  - 12/02,04: Project Videos
  - 12/03: All Deliverables
  - 12/05: Design Day
  - 12/10: Capstone Wrap Up
    (10:00 a.m. – 12:00 p.m.)

- Attendance is required.
- No excuses are accepted.
- Do not schedule anything during these times including interviews, travel home, etc.
- Will coordinate with your interviews.
- **Do NOT buy plane tickets to go home.**
- Read the syllabus.

Team Organization

- Up to Each Team
- Organize into Roles
  - Sponsor/Client Contact
  - Program Manager
  - Developer Roles
    - Web
    - Mobile
    - Back End
    - Front End
    - Etc.
  - Tester
  - Systems Administrator
  - Etc…
- Everyone must make significant technical contributions, including significant software contributions. ← **Fair Warning**

Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Potential Teammate Problems
  - Not Attending Team Meetings
  - Not Being Involved
  - Not Responding
  - Not Completing Tasks On Time
  - Submitting Poor Work
  - Leaving Work for Others
  - Working Job Too Many Hours
  - Etc…
- Address Problems Immediately
  - Within Team
  - In Weekly Triage Reports
  - With Dr. D., Dr. J., Luke, Griffin, Jared
- Be Ready to Discuss During Interviews

Grading

- Team (70%)
  - Project Plan Document & Presentation 10
  - Alpha Presentation 10
  - Beta Presentation 10
  - Project Video 10
  - Project Software & Documentation 30
  - Total 70
- Individual (30%)
  - Technical Contribution 10
  - Team Contribution 10
  - Team Evaluation 05
  - Meeting Attendance, Preparation & Participation 05 ← Can Be Negative
  - Total 30

Grading

- Final Grade Sum Of…
  - Individual Total
  - % of Team Total Based on Team Contribution
- Grand Total =

  (Individual Total)

  +

  (Team Total) * (Team Contribution) / 10.0
- *Nota Bene*: Your Team Contribution will have a very significant effect on your final grade.

Grading

[3 of 9]

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					

Grading

[4 of 9]

- Every student must earn the following required minimal grades in each grading category.
- Failure to earn the required minimal grades in any of the grading categories is grounds for receiving a final grade of 0.0 for the course.
- Minimal Team Grade Requirements
  - Project Plan Document & Presentation 5.0 / 10.0
  - Alpha Presentation 5.0 / 10.0
  - Beta Presentation 5.0 / 10.0
  - Project Video 5.0 / 10.0
  - Project Software & Documentation 15.0 / 30.0
- Minimal Individual Grade Requirements
  - Technical Contribution 5.0 / 10.0
  - Team Contribution 5.0 / 10.0
  - Team Evaluation 2.5 / 05.0
  - Meeting Attendance, Preparation & Participation 0.0 / 05.0

Grading

Absence does not make your teammates' hearts grow fonder.

- Nonresponsive
  - Email
  - Slack
  - Discord
  - Microsoft Teams Messages
  - Phone
- Miss Meetings
  - All-Hands & Split-Hands
  - Triage
  - Sponsors
  - Team
- Miss Work ← **Key**
  - In Lab and/or Online with Teammates
  - During Sprints
  - Before Major Milestones
- Miss Deadlines
  - Other team members may be forced to do your work.
  - We will tell other team members they… ← **Fair Warning**
    - …can take over the tasks assigned to you.
    - …no longer need to assign you any tasks.

NB: Your teammates will be evaluating you weekly and at the middle and the end of the semester.

Grading

- 100% In Person Meetings
  - All-Hands & Split-Hands
  - Triage
  - Team Meetings with Sponsors
  - Team Meetings
- Accommodating Student Schedules
  - Only Reasonably for Class Schedules and Work
  - Not for Students
    - Traveling for Personal Reasons
    - Working ≥ 15 Hours Per Week
    - Commuting to Campus

Grading

[7 of 9]

Unacceptable Excuses for Not Contributing

- My teammates…
  - …never asked me to do anything.
  - …never let me do anything.
  - …mistreated me.
- My features were…
  - …not included in the project.
  - …deleted by our client
- I wrote lots of code, but it wasn't included in the project.
- I work 15 hours per week at my job.
- I live 60 minutes from MSU.
- I didn't want to work on this project team.
- I did a lot of research about stuff we never used.
- I was busy interviewing.
- Etc…

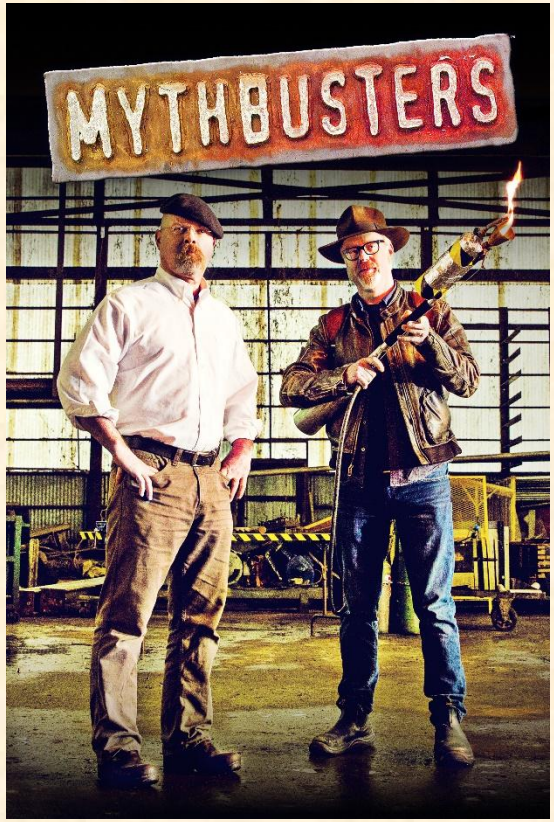
Grading

[8 of 9]

- We reserve the right to make changes with sufficient notice.
- No special consideration will be given for final grades, including but not limited to
  - status in any academic program at MSU including CSE,
  - status in a graduate program, including at MSU,
  - the need to be graduated this semester,
  - the ability to enroll in CSE498 next semester,
  - financial aid,
  - hours worked in a job while a student at MSU,
  - distance commuting to MSU,
  - anticipated graduation from MSU,
  - acceptance of a job in anticipation of graduation,
  - rank in the armed forces,
  - mortgage on a property,
  - rental lease on a property,
  - upcoming wedding,
  - visa status,
  - or anything else.

Grading

- Number of 0.0's by Semester
  - 2022 F 8
  - 2023 S 12
  - 2023 F 11
  - 2024 S 9
  - 2024 F 8
  - 2025 S 9
- Do students fail capstone? Yes



Meeting Attendance, Preparation & Participation (MAPP) [1 of 6]

"Meeting-Ready"

- In Person
  - Ready
    - Seated with Team in Correct Room in Assigned Seat
    - Coat and Hat Off
    - All Mobile Devices in Airplane Mode and Stowed
  - Not Ready
    - Entering the Room
    - Walking to a Seat
    - Taking off Coats and/or Stowing Devices
- Online
  - Ready
    - Joined to Microsoft Teams Meeting in Correct Channel
    - In Appropriate Location
  - Not Ready
    - Joined Using Only a Phone
    - In Inappropriate Location (Car, Bar, In Line at the RIV, etc.)

Meeting Attendance, Preparation & Participation (MAPP) [2 of 6]

Attendance Process

- In Person
  - By TM
  - Sign a Form
    (Forging another student's name will result in an ADR and 0.0.)
- Online
  - Microsoft Teams
    - Who
    - When Joined/Left the Meeting
  - Google Forms
    - One or More at Random Time During Meeting
    - One at End of Meeting
    - 60 Seconds to Complete

Google Form Attendance Check

↑↑↑↑↑↑↑↑↑

Only An Example

Meeting Attendance, Preparation & Participation (MAPP) [3 of 6]

MAPP Point Deductions

- All-Hands / Split-Hands
  - Meeting-Ready≤ 3:00:00 p.m.
    - Present
    - -0.0 MAPP Points
  - 3:00:01 p.m. ≤ Meeting-Ready ≤ 3:05:00 p.m.
    - Late
    - -0.5 MAPP Points
  - Meeting-Ready > 3:05:00 p.m.
    - Absent
    - -1.0 MAPP Points
  - Leave Meeting Before Ended by Instructor
    - In Person
      - Must Swipe Spartan ID Cards with TM, Leaving and Returning
      - Must Leave and Reclaim Mobile Devices with TM (Approved by University Ombudsperson)
      - -1.0 MAPP Points if (Fail to Swipe and/or Leave Mobile Devices) or (Extended Period)
    - Online
      - Miss Google Form (During or At End)
      - -1.0 MAPP Points
  - Weekly Triage Google Form and Google Slides
    - Late or Not at All
    - -0.5 MAPP Points
  - MAPP grade may become negative.

Meeting Attendance, Preparation & Participation (MAPP) [4 of 6]

- Almost No Excuses Accepted
  - One or Two Excused Possible for Interviews
    (Many are remote. Schedule them around Capstone.)
  - Must Provide Information
    - Date, Company, Recruiter Name & Contact Info
    - In Advance
    - To Instructors
- Must Attend (No Excuses Accepted)
  - Your Team Presentations
  - All Project Video Viewing
  - Design Day
  - Design Day Wrap Up
- Read the syllabus.
  - Meeting Attendance, Preparation and Participation (MAPP) Grade
  - Meeting Attendance Policies and Procedures

Do NOT schedule interviews.
Do NOT schedule ANYTHING.
Do NOT buy plane tickets. ←Note

-5.0 MAPP Points Per Absence

Meeting Attendance, Preparation & Participation (MAPP) [5 of 6]

- Excused Meeting Absences
  - Job Interviews
    - Documentation Deemed Valid
    - In Advance
  - Sickness Including COVID
    - Documentation Deemed Valid
      - Stating Not Able to Attend Due to Illness
      - By Local Medical Professional
    - Not Later Than Two Days
    - If Concerned, May Sit Masked in Back of Meeting Room
    - Read the Syllabus
  - Grief Absence
    - See MSU Policy
    - Done in Advance
  - Some MSU Events
- Cannot Accommodate Most Conflicts
- No Accommodations for Personal Reasons Other Than Above
- **Will NOT Be Excused from Doing Work ←Very Important Note**

Meeting Attendance, Preparation & Participation (MAPP) [6 of 6]

- Requesting Excused Absences
  - Handled by Dr. J. and TM
    - Email Dr. J. and TM
    - CC Dr. D.
      (Dr. D. will not forward or respond.)
- Taking or Retaking Capstone in Spring 2026
  - Due to Dropping or Failing
  - Extremely Limited Enrollment
  - First-time eligible students will get first priority.
  - You may not be able to take capstone in the spring. **←Note**
    - Re-enroll After Dropping
    - Re-take After Failing

GitLab

- Every team must use MSU's GitLab.
  - Manage All Project Code
  - Instructors must have access.
- Access by External Project Sponsors
  - Can Accommodate
  - Contact Dr. J.
- To Receive Credit for Code, Student Must
  - Commit Code
  - Using Student's GetLab Account
- Read the syllabus.

Team Contribution

- What % of Team Grade (70 Points) Did Student Earn?
- Based on Variety of Factors Including But Not Limited to…
  - Attendance and Participation
    - Team Meetings
    - Project Sponsor Meetings
    - All-Hands/Split-Hands Meetings
  - Completion of Tasks
    - Size and Number
    - Correctly
    - On Time
  - Willingness to Take on New Tasks
  - Making Significant Technical Contribution
- Read the syllabus.

Technical Contribution [1 of 3]

- Required of Everyone
- Significant Work and Code
- Does Not Include Code…
  - Committed to GitLab by Someone Else
  - That Does Not Work
  - Copied from the Internet
  - Generated by ChatGPT or any AI/LLM tool or any tool. (Not Allowed)
  - Simple Front-End Work: HTML and/or CSS
  - Not Included in The Project
  - Not Relevant to the Project
  - For CheckInCount = 1 to 100 {Modify Code Slightly; Checked Code In Again}
  - Etc…
- Necessary, but Not Sufficient
  - Doing Research
  - Creating UI/UX Designs
  - Creating Presentations and/or Documents
  - Giving Presentations
- Read the syllabus.

Technical Contribution [2 of 3]

- Pair Programming
  - Writing Code Together
  - Not Watching Someone Else Write Code
  - Must Decide When Committing Who Gets Credit for What
  - Receive Credit Only for Code Checked Under Your Account
- Demonstrating and Explaining Software
  - By Author
  - Any Time
  - In-Person
    - Lab iMacs
    - Personal Laptop
  - If Not Able, Assume
    - Not Working
    - Did Not Write

Meeting and Work Expectations

- Meetings
  - In Person
  - Possibly Excused but Very Limited
  - If Miss Team Presentation, Must Give Presentation to Instructors
- Work
  - Entire Semester
  - Cannot Excuse Work Even if…
    - …Meeting Attendance Excused
    - …Attending Meetings
  - Missing work…
    - …may affect Technical Contribution.
    - …will affect Team Contribution.
    - …will affect Final Grade.
- Example
  - Miss Entire Week
    - Attendance
      - Excused: -0
      - Unexcused:
        - -3+ MAPP Points == 3+% of Final Grade
        - -10 MAPP Points == 10% of Final Grade
    - Work
      - Attendance Excused or Unexcused
      - 1/15th Semester = 7% Semester ⇒ Earned Team Points ≤ 93% of 70 Points
      - At Least -7% of Team Contribution Grade == At Least -4.9% of Final Grade
- **Read the Syllabus.**

Technical Contribution [3 of 3]

- Significant Effect on Team Contribution
- Project Software == 43% Team Grade
- No Significant Technical Contribution
  - No Credit for Project Software
  - Maximum of 57% of Team Grade
  - Maximum Team Contribution of 5.7/10.0
  - Most Likely Will Not Pass CSE498
- Read the syllabus.

Final Grade Scenario 1

- Scenario
  - Missed Week
  - Attendance Excused
  - Missed Work
  - All Other Grades Perfect ← **NOTE: 0% Chance**
  - Maximum Possible Grade
- Team (70%)
  - Project Plan Document & Presentation 10.0
  - Alpha Presentation 10.0
  - Beta Presentation 10.0
  - Project Video 10.0
  - Project Software & Documentation 30.0
  - Total 70.0
- Individual (30%)
  - Technical Contribution 10.0
  - Team Contribution 9.3 ← **Maximum Grade. Less Likely Less.**
  - Team Evaluation 5.0
  - Meeting Attendance, Preparation & Participation 5.0
  - Total 0.93*70 + 10 + 9.3 + 5 + 5 94.4 ← **Maximum Grade. Most Likely Less.**

1 Week == 1/15 Semester
~= 7% Semester

1 Week Work Missed == 7% Team Work Missed

Max Team Contribution Grade 10.0 – 0.7 = 9.3

Final Grade Scenario 2

- Scenario
  - Missed Week
  - Attendance Not Excused
  - Missed Work
  - All Other Grades Perfect ← **NOTE: 0% Chance**
  - Maximum Possible Grade
- Team (70%)
  - Project Plan Document & Presentation 10.0
  - Alpha Presentation 10.0
  - Beta Presentation 10.0
  - Project Video 10.0
  - Project Software & Documentation 30.0
  - Total 70.0
- Individual (30%)
  - Technical Contribution 10.0
  - Team Contribution 9.3 ← **Maximum Grade. Most Likely Less.**
  - Team Evaluation 5.0
  - Meeting Attendance, Preparation & Participation 1.5 ← **Maximum Grade. Possibly Less.**
  - Total 0.93*70 + 10 + 9.3 + 5 + 3.5 90.9 ← **Maximum Grade. Most Likely Less.**

1 Week == 1/15 Semester
~= 7% Semester

1 Week Work Missed == 7% Team Work Missed

Max Team Contribution Grade 10.0 – 0.7 = 9.3

Final Grade Scenario 3

- Scenario
  - Minimum Technical Contribution
  - All Other Grades Perfect ← **NOTE: 0% Chance**
  - Maximum Possible Grade

Max Project Software Credit == 30 * 5/10 == 15
Max Team Total == 40 + 15 == 55
Max Team Contribution == 10 * 55/70 == 7.9

- Team (70%)
  - Project Plan Document & Presentation 10.0
  - Alpha Presentation 10.0
  - Beta Presentation 10.0
  - Project Video 10.0
  - Project Software & Documentation 30.0
  - Total 70.0
- Individual (30%)
  - Technical Contribution 5.0 ← **Minimal Grade.**
  - Team Contribution 7.9 ← **Maximum Grade. Most Likely Less.**
  - Team Evaluation 5.0
  - Meeting Attendance, Preparation & Participation 5.0
  - Total 0.79*70 + 5 + 7.9 + 5 + 5 78.2 ← **Maximum Grade. Most Likely Less.**

Final Grade Scenario 4

- Scenario
  - No Technical Contribution
  - All Other Grades Perfect ← **NOTE: 0% Chance**
  - Maximum Possible Grade

Max Project Software Credit == 30 * 0/10 == 0
Max Team Total == 40 + 0 == 40
Max Team Contribution == 10 * 40/70 == 5.7

- Team (70%)
  - Project Plan Document & Presentation 10.0
  - Alpha Presentation 10.0
  - Beta Presentation 10.0
  - Project Video 10.0
  - Project Software & Documentation 30.0
  - Total 70.0
- Individual (30%)
  - Technical Contribution 0.0
  - Team Contribution 5.7 ← **Maximum Grade. Most Likely Less.**
  - Team Evaluation 5.0
  - Meeting Attendance, Preparation & Participation 5.0
  - Total 0.57*70 + 0 + 5.7 + 5 + 5 55.6 ← **Maximum Grade. Most Likely Less.**

Using Existing Code

- Ok for Learning
  - Examples
  - Prototypes
  - Open-Source Code
    - Fragments
    - Libraries
    - Utilities
- Not Ok for Project Code
  - Copy-and-Paste
  - Not Open Source
  - ChatGPT or AI/LLM Tool **←Note**
- Ask instructors and client in advance.
- Document and report all existing code used.
- Be Careful!

Add something for spring 2026 re using AI/LLM tools for creating documents and/or slide decks.

Will result in Academic Dishonesty Report (ADR)

Professionalism

- Be Professional and Respectful
  - Talking
  - Emailing
  - Texting
  - Messaging
  - Communicating in Any and All Forms
- Avoid Anything
  - Disrespectful
  - Offensive
  - Derogatory
  - Rude
  - Etc.
- All complaints must be reported even if complainant requests otherwise.

Travel to Client

- Reimburse for Mileage for Personal Car
- Travel Within Michigan (Outside of Lansing)
  - Benton Harbor
  - Battle Creek
  - Kalamazoo
  - Grand Rapids
  - Metro Detroit
- From East Lansing to Client and Back
- Cars Per Team Per Trip
  - < 6 Team Members, 1 Car
  - = 6 Team Members, 2 Cars
- See Brenda in the CSE office in advance.

Accommodation Letter

- Inform Professor Mariani
  - Email Letter to Professor Mariani
  - By Friday, August 29
- Obtaining an Accommodation
  - Request From RCPD Specialist in Advance
  - RCPD Specialist will contact Professor Mariani.

Integrity of Scholarship

- MSU's policies will be enforced.
- Academic dishonesty will include but not be limited to
  - committing code not written by the student to a team's main GitLab branch;
  - demonstrating code not written by the student to the instructors and inferring that its was written by the student;
  - attempting to inflate the technical contribution by committing code not related to the project or by making multiple trivial commits or by any other means; and
  - providing false information to the professors, instructors or fellow team members about matters related to the course will be considered academic dishonesty.
- Violators…
  - …will be reported by an Academic Dishonesty Report (ADR).
  - …will receive a grade of 0.0 in the course.

“Office” Hours

- Office
  - Any Time
  - Welcome to Call in Advance
- Email
- Microsoft Teams
  - Message
  - Meet
- Schedule an Appointment
  - In Person
  - Online via Microsoft Teams
- See Syllabus

Final Grade Appeal

- Students Must Demonstrate
  - Rights Violated
  - Base on Preponderance of the Evidence
- Steps to be Completed <u>In Order</u>
  1. Meet with Instructors
  2. Meet with Professor Owen
  3. Request a Hearing
- Hearing Board
  - Normally Three Professors and Two Students
  - Cannot Change Grade ← **Nota Bene**
  - If Board Finds in Favor of Instructors
    - Matter Closed
    - Assigned Final Grade Stands
  - If Board Finds in Favor of Student
    - Matter Forwarded to CSE
    - Chairperson Selects CSE Professor to
      - ❖ Consider Evidence
      - ❖ Affirm Assigned Final Grade or Assign New Final Grade
- Nota Bene: Hearing Timing
  - Lengthy Process to Resolve
  - Two or More Months After Semester End
- Read the syllabus.

Problems

- Address Immediately
  - Respectfully
  - Within Team
  - With
    - TMs
    - Dr. J. & Dr. D.

We don’t have one of these.

Capstone Overview

✓Course Logistics

✓Client Projects

✓Course Logistics (Continued)

Questions?

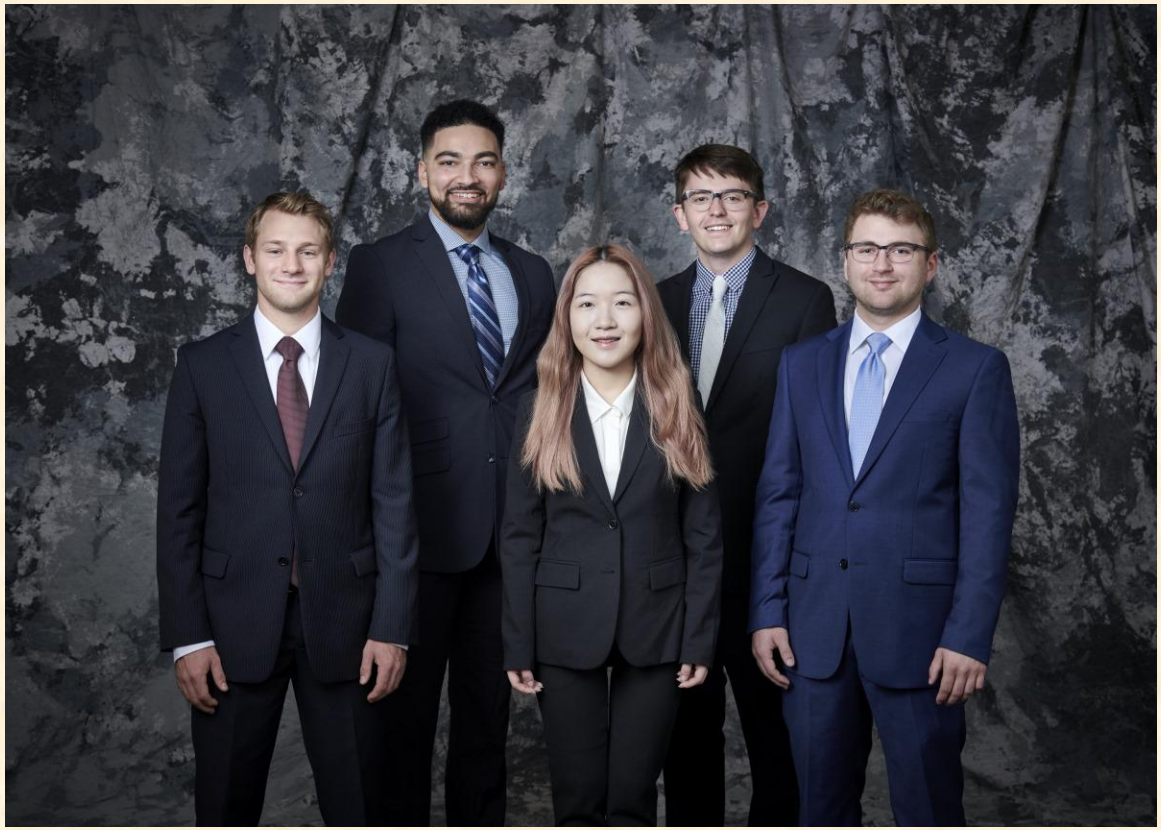
We're not done yet.

Team Photos

- Taken by Professional Photographer
- Used
  - On Capstone Website
  - On Design Day Website
  - In Design Day Booklet
  - In The Capstone Experience Booklet
- Dress
  - Business or Business Casual
  - Team Coordinated
  - Look Professional
  - Respect Personal Cultural and/or Religious Traditions
- Cannot Be Changed **←Note**
  - After Publications Printed
  - After Websites Published

Team Photos

- Team Amazon, Fall 2019



Team Photos [3 of 9]

The Capstone Experience
From Students...to Professionals

CSE498, Collaborative Design, Fall 2019
Computer Science and Engineering
Michigan State University

> Home
> News
+ Projects
+ Schedules
+ Design Day
+ Other Links
+ Archives
> Contact Us

Team Amazon

amazon

Detroit, Michigan
Seattle, Washington

SPARTI: Selling Partner Application Ready to Integrate

Watch the Video...

Founded in 1994 as an online bookstore, Amazon is the largest online retailer in the world. Amazon has seen tremendous growth and success, making history by becoming the second U.S. company to be valued at $1 trillion. A key factor in Amazon's rise to the top is their e-commerce platform, which accounted for nearly 50% of all online retail purchases last year.

Today, more than half of the items sold on Amazon are managed and listed by third-party sellers. Amazon third-party sellers utilize the Amazon Seller Central portal to manually manage their listings and inventories on Amazon's platform. While the Seller Central site works well for small businesses, manual management becomes close to impossible for large and growing businesses.

Third-party sellers often create custom selling management applications. However, the process of creating these custom applications is often too difficult or overly time-consuming.

Our SPARTI application (Selling Partner Application Ready to Integrate) enables Amazon's third-party sellers to quickly and easily create custom selling management applications.

SPARTI provides users with a template application capable of fully connecting with Amazon's seller services. To deploy their custom site, a third-party seller merely needs to update the given template code with their own information.

Turnkey integration with Amazon Web Services (AWS) is also supported within SPARTI, giving third-party sellers the ability to automatically deploy and host their applications in the cloud.

Within the course of a day, a third-party seller is able to utilize the SPARTI project to build a containerized .NET application hosted on AWS ECS Fargate. The infrastructure for the application is instantiated by AWS CloudFormation.

Team Amazon

SPARTI: Selling Partner Application Ready to Integrate

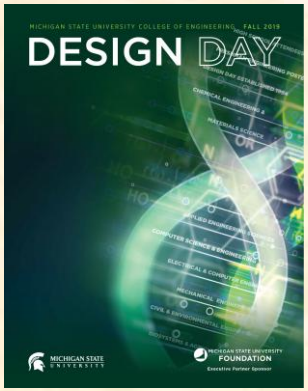
Watch the Video...

MSU Team Members (Left to Right)

Tyler Rozwadowski, Waterford, Michigan
Jordan Mulcahy, Jackson, Michigan
Rose Wang, Shanghai, Shanghai, China
Matt Maple, Portage, Michigan
Noah Girard, South Lyon, Michigan

Home | Site Map | News | Project Sponsorship | Maps and Directions | Contact Us

Department of Computer Science and Engineering
MICHIGAN STATE UNIVERSITY



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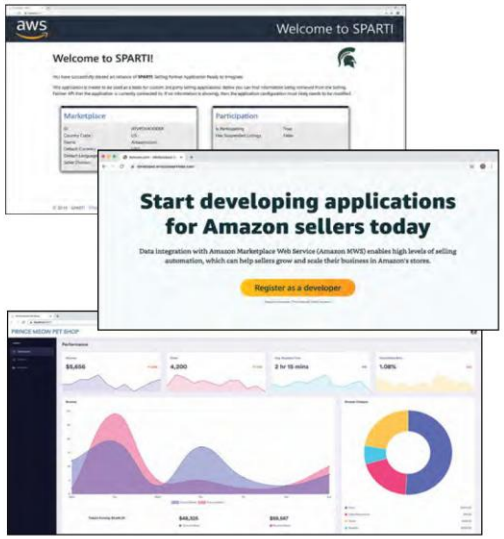

amazon

Michigan State University
Team Members (left to right)

Tyler Rozwadowski
Waterford, Michigan

Jordan Mulcahy
Jackson, Michigan

Rose Wang
Shanghai, Shanghai, China

Matt Maple
Portage, Michigan

Noah Girard
South Lyon, Michigan

Amazon
Project Sponsors

Christin Burek
Seattle, Washington

Garret Gaw
Detroit, Michigan

Evan Daikoku
Seattle, Washington

Sushma Gopalakrishnan
Detroit, Michigan

Madhuri Marri
Detroit, Michigan

Team Photos
[4 of 9]

The Capstone Experience
From Students...to Professionals
COMPUTER SCIENCE AND ENGINEERING 2021-2022

MICHIGAN STATE UNIVERSITY
Auto-Owners INSURANCE

Amazon
SPARTI: Selling Partner Application Ready to Integrate

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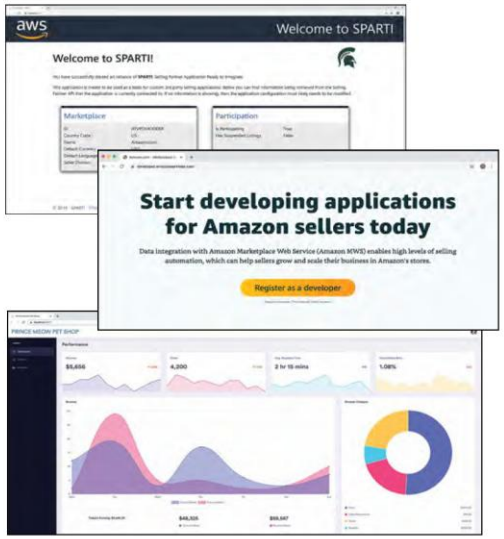

amazon

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Amazon
Project Sponsors

Christin Burek
Seattle, Washington

Garret Gaw
Detroit, Michigan

Evan Daikoku
Seattle, Washington

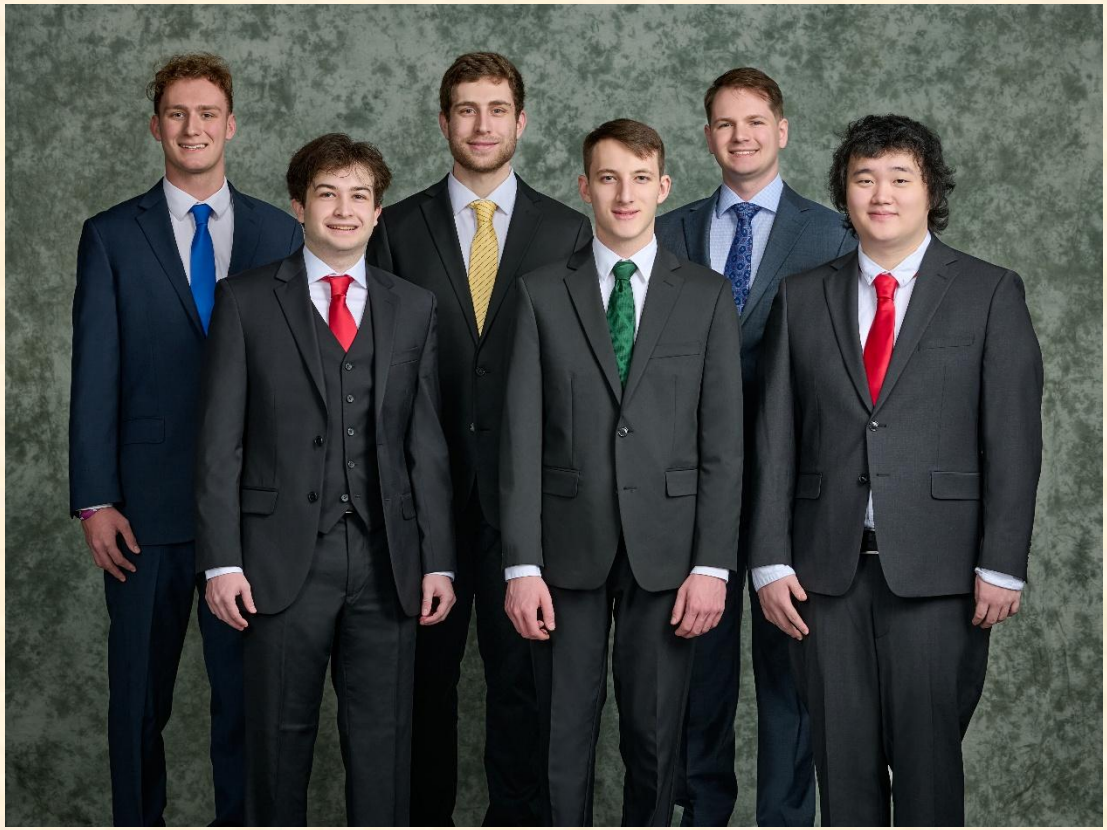
Sushma Gopalakrishnan
Detroit, Michigan

Madhuri Marri
Detroit, Michigan

Team Photos
[5 of 9]

Team Photos

- Team Google, Spring 2024



Team Photos

- Team HAP, Fall 2024

Team Photos

- Team WK Kellogg Co, Spring 2025

Team Photos

[9 of 9]

- Coordinated by Dr. J.
- Friday, September 19, 9:00 a.m. – 5:00 p.m.
  - On-Time Attendance Required by **All** Team Members
  - Put on your calendar now. ← **Note**
  - Do not plan travel. ← **Note**
  - Outside of Engineering 3105 (CSE Conference Room)
  - Missing == Up to -5.0 MAPP Points
- Dress
  - Business Preferred
  - At Least Business Casual
  - Team Coordinated
- Photo Availabilities Due by Tomorrow Night

What's ahead?

[1 of 4]

- Upcoming Meetings
  - 09/02, Tu: Risks and Prototypes
  - 09/04, Th: Project Plan
  - 09/09, Tu: Team Status Report Presentations
  - 09/11, Th: Schedule and Teamwork
  - 09/16, Tu: Team Project Plan Presentations
  - 09/18, Tu: Team Project Plan Presentations
  - 09/19, Fr: Team Photos (9:00 a.m. – 5:00 p.m.)

What's ahead?

[2 of 4]

- Split-Hands Meetings
  - Used On Presentation Days
    - 09/09: Team Status Report Presentations
    - 09/16,18,23: Team Project Plan Presentations
  - Three Locations
    - Luke: 1287 Anthony Hall
    - Griffin: 2400 Engineering Building
    - Jared: 1345 Engineering Building
  - Find the rooms in advance.
  - Attendance Taken As Usual Including Lateness

What's ahead? [3 of 4]

- Website, Email and Team's Messages
  - Check Constantly
  - Read Carefully
  - Not Seeing and/or Reading Email ≠ Valid Excuse
- Triage Meetings
  - Scheduled
  - Attendance & Preparation (MAPP Points)
- 09/16, 09/18: Team Project Plan Presentations
  - Slide Deck Posted Online
  - Read and Review
  - Discuss in Triage Meetings

What's ahead?

[4 of 4]

- 09/09: Team Status Report Presentations
  - 2.5 Weeks From Today **←Note**
  - Split-Hands Meeting
  - Slide Deck Template Posted on Downloads Page
    - 4 Slides
    - Presentation 6 Minutes Max
  - Must Use Windows Version of Office 365 **←Note**
    (See Other Links > Syllabus 30. Editing Documents and Presentations Using Office 365)
  - Read Submission Instructions Carefully
  - Due by 11:59 p.m. ET, Monday, 09/08
  - Upload Two Times to Microsoft Teams
    - To General Channel File Space
      Folder "Team Status Report Presentation Slide Decks"
    - To Capstone Team's Private Channel
  - Aggregated Slide Decks by TM
    - On TM's Laptop Used by All Teams
    - One or More Presenters Per Team
    - Random Order

Using Office 365

- Word and PowerPoint Processed by Software
- Use Office 365 Natively on Windows 11
- Do not…
  - …copy-and-paste from any other application.
  - …use the web version of Office 365.
  - …use the collaborative version of Office in Teams.
  - …use Apple's office suite.
  - …use the "Try the new…" version of Office.
- Not Processable == No Credit

- See Other Links > Syllabus 30. Editing Documents and Presentations Using Office 365

Aside: Filenames

- Convention
  - Use all lowercase.
  - Delete non-numeric and non-alphabetic characters except dashes.
  - Replace blanks by dashes.
- Examples
  - Team Amazon
    team-amazon-status-report-presentation.pptx
  - Team Auto-Owners
    team-auto-owners-status-report-presentation.pptx
  - Team Kohl's
    team-kohls-status-report-presentation.pptx
- File misnamed == Not Submitted == No Credit

Delete this slide.

Read Me

[1 of 2]

- Presenting
  - The Status Report Presentations will be given on Tuesday, September 9.
  - The purpose of your Status Report Presentation is for your team to demonstrate that you have made significant progress on your project. In particular, you will give status reports on a variety of things including the status of project sponsor contact, project sponsor meeting schedules, team meeting schedules, team organization, server systems and software, development systems and software, a brief description of the project, the status of your project plan and the initial identification of risks.
  - The time limit for your presentation is 6 minutes, which will be strictly enforced. Practice your presentation to ensure that your team will finish within the allotted time of 6 minutes.
  - Be ready to answer questions, including tough questions.
  - We will meet in "split-hands" meetings. Luke's teams will meet in 1249 Anthony Hall, Griffin's teams will meet in 2400 Engineering, and Jared's teams will meet in 1345 Engineering.
  - Dr. D. will combine the individual team slide decks into multiple slide decks, one for each TM.
  - Your TM will project the combined slide decks using their laptop, which your team will use for your presentation.
  - Your team may have one or more presenters.
  - The order in which the teams will present will be random.

Delete this slide.

READ ME

[2 of 2]

- Creating and Editing
  - Read and follow the instructions in “Editing Documents and Presentations Using Office 365” of our course syllabus.
  - You must use this PowerPoint slide deck template as is. Do not change the number of slides unless the instructions explicitly allow you to duplicate slides. Do not change the order of the slides. Do not change the styles. Do not edit the master slides.
  - Throughout the template, replace placeholders […] with the appropriate information.
  - Edit the center footer by clicking the Header & Footer button on the Insert ribbon. Change [Team Name] in the footer to your company name as in “Team TechSmith Status Report Presentation”. If necessary, extend the width of the center footer textbox on the master slide, making sure that you re-center the enlarged textbox.
  - Do not include any company confidential information in your presentation.
  - Delete every textbox that includes “Delete this textbox” and every slide that includes “Delete this slide.”
- Submitting
  - All presentations must be submitted to us and to your client by 11:59 p.m., Monday, September 8.
  - Name your PowerPoint slide deck file as “team-[team-name]-status-report-presentation.pptx” replacing “[team-name]” with your team’s name normalized by using all lower case, deleting non-numeric and non-alphabetic characters, and replacing blanks by dashes. Examples include “team-kohls-status-report-presentation.pptx” and “team-delta-dental-status-report-presentation.pptx”. Set File Explorer or Finder to show all file extensions to ensure that there are no blanks before the “.pptx” extension as in “team-amazon .pptx”.
  - Upload your PowerPoint slide deck to the folder “Status Report Presentation Slide Decks” in our Microsoft Teams General Channel file space by 11:59 p.m., Monday, September 8. In addition, upload your slide deck to your team’s private channel file space in case your slide deck is deleted by accident from the General Channel file space. Set File Explorer or Finder to show all file extensions to ensure that there are no blanks before the “.pptx” extension as in “team- amazon .pptx”.
  - Email a copy of your slide deck to your client as well by 11:59 p.m., Monday, September 8. Do not cc us on that email. Include some professional text in the body of your email to practice being a professional and to avoid having your email sent to your project sponsor’s junk folder.

MICHIGAN STATE UNIVERSITY

Status Report Presentation

[Project Title 36pt]

The Capstone Experience

Team [Team Name 24pt]

[Team Member 1 16pt]
[Team Member 2 16pt]
[Team Member 3 16pt]
[Team Member 4 16pt]
[Team Member 5 16pt]
[Team Member 6 16pt]

Department of Computer Science and Engineering
Michigan State University

Fall 2025

Status Information:
Think clicking "Status" on an Amazon order.

- You bought this on Monday, August 25. Helpful?
- We're going to send this to you. Satisfied?
- People who bought this also bought…. We good?

Where the $*(%($* is my order?

Delete this textbox.

From Students…
…to Professionals

Team [Team Name]

Status Report

[1 of 4]

[Project Title]

- Sponsor Overview
  - Overview Point 1
  - Overview Point 2
  - Overview Point 3
- Project Overview
  - Description Point 1
  - Description Point 2
  - Description Point 3
  - Description Point 4

Describe your sponsor is 30 seconds or less.

Delete this textbox and the brace to the left.

Describe your project in 30 seconds or less.

What problem does it solve?

Who will use it? How will they use 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
- Project Plan Document
  - Status Point 1
  - Status Point 2
  - % Complete

Include status information.

Are all systems up and running?

Have you tested everything?

Delete this textbox and the brace to the left.

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

[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

A "Risk" is a significant task that you need to accomplish that you currently do not know how to do. Usually, a risk is a "showstopper," meaning if you cannot complete the task, you cannot complete your project.

"Mitigation" for a particular risk is your plan for eliminating that risk; that is, your plan for figuring out how to accomplish the task.

List only "real" risks. For example, learning 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.