MICHIGAN STATE UNIVERSITY

Project Plan Presentation Personalized Augmented Reality Experience

The Capstone Experience

Team MSUFCU

Berkay Aydin Matthew Whyte Matt Wright Becca Winkler Joanna Zhan

Department of Computer Science and Engineering Michigan State University

Spring 2024



From Students... ...to Professionals

Project Sponsor Overview

- MSUFCU is a federal credit union based out of East Lansing
- Committed to superior banking and betterment of local communities
- As of 2024, MSUFCU serves 361,000 members and has \$7.71 billion in assets



The Capstone Experience

Project Functional Specifications

- Project aims to create an innovative approach to the in-person banking experience
- Increases efficiency and personalizes inbranch visits
- Allows users to control their visit and the level of interaction needed
- Embraces modern technology while promoting old-school banking

Project Design Specifications

- Prompt user engagement in the AR experience via mobile push notification (geolocation)
- Facial recognition to complete the sign-in process
- Personalized visit recommendations based on previous visits to location
- External display guiding customer through specific branch services
- Optional experience open to user's who opt in

Screen Mockup: Opt-In Service

Augmented Reality Experience	Augmented Reality Experience
Welcome!	Thanks for Opting in!
This page offers a personalized, on-site augmented reality experience through the use of geolocation and facial recognition! If you would like to get started with this experience, press the button below!	What's next? Head on over to the nearest MSUFCU location for a seamless, personalized banking experience!
Press here to opt in!	Find a location near you
	How does this work?
MSU FEDERAL CREDIT UNION	MSU FEDERAL CREDIT UNION
= ∞ @ ↔ @	

The Capstone Experience

Team MSUFCU Project Plan Presentation

Screen Mockup: Location Based Notifications



Thursday, January 18 11:55 Sign into your appointment using our new Augmented 0 Swipe up to

Screen Mockup: Personalized Experience





Welcome in, Matthew!

Scan facial recognition on your phone to get started

Screen Mockup: Tailored Recommendations

11:30	11:30 util ? Augmented Reality Experience
Recommendations	Subtopic - Card Services
Card Services	Apply for new Credit Card
Cash/Deposit/Withdrawal	Change existing Credit Card
Loan	Questions on existing Credit Card
A Mortgage	Card Fraud/Replacement
L+ New Account	Additional information.
Other	Back Submit
Accounts MoveMoney eDeposit My Offers AR Experience	Accounts WaveMoney aDeposit Wy Offers all Experiments

Team MSUFCU Project Plan Presentation

Project Technical Specifications

- Full stack application built with a WebSocket server
- Mobile application developed using SwiftUI (MapKit and Starscream packages)
- Web application developed with HTML, Tailwind CSS, and JavaScript
- Flask-SocketIO and Starscream extensions provide WebSocket handling for realtime communication
- Back-end server hosted by AWS and containerized by Docker

Project System Architecture



Project System Components

- Hardware Platforms
 - On-site External Screen
 - Computer or Smart TV
 - Mobile Device (iOS)
- Software Platforms / Technologies
 IOS Mobile Application:
 - SwiftUI, MapKit, Starscream
 - Web Application:
 - Tailwind CSS, MySQL, HTML5, Flask, Amazon Web Services EC2

Project Risks

Real-time phone-to-screen connection

- Users will be greeted by an external screen, synchronously guiding them through branch activities. There are uncertainties about establishing an efficient and effective connection between the two devices
- Members have explored using WebSockets via Flask-SocketIO to establish a secure and realtime connection
- User's location in relation to MSUFCU using geofencing
 - The user's location is needed to send an AR Experience notification when they are at a MSUFCU branch, along with requiring accurate geofencing for MSUFCU's branch location.
 - The user's location can be found using SwiftUI and the branch location can be found using Google Maps API, this can be tested on-site after implementation

Privacy with two-factor authentication

- Authentication for accessing private banking information must align with the proposal's augmented reality specifications and incorporate facial recognition technology
- Require the user to bring their own phone and authenticate using iPhone's facial recognition
- Personalized features for each user
 - In an augmented reality experience, the software should offer customized features based on the user's perceived intent for visiting the branch or their past branch interactions
 - The branch activity options will be presented through being stored in a MySQL database hosted on AWS EC2, providing suggestions reflective of their consistent engagement

Questions?

