FIT AR Navigation App (FITARNA)

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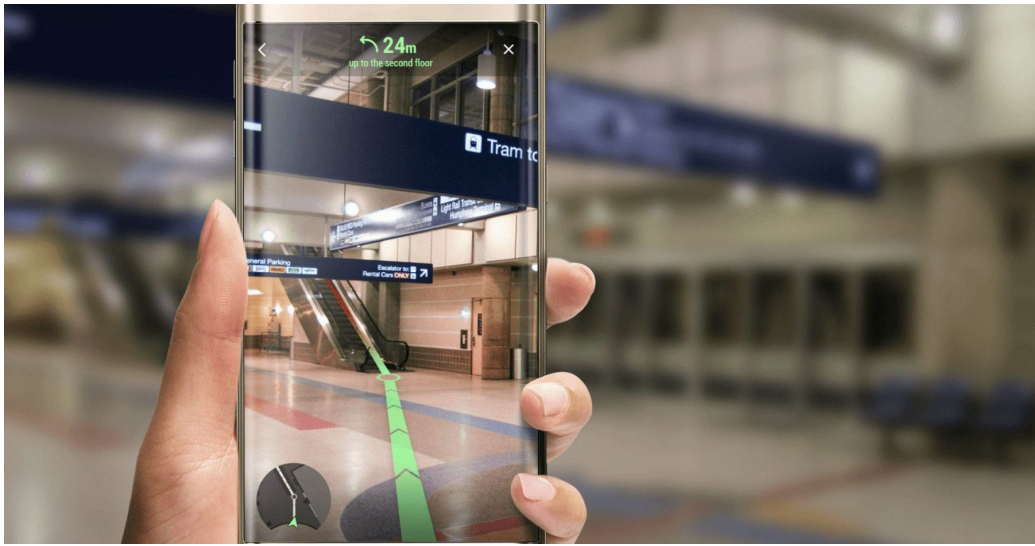
Table of Contents



MobiDev. (2020, February 12). *Augmented reality indoor navigation demo*

Goals and Motivation

- Locating specific rooms can be confusing for those unfamiliar, and while staff could help with this, they may not be around or available to guide those in need.
- Navigation becomes especially difficult when a user has a specific destination without knowing its room number or general location.
- Maps take time to comprehend and offer limited information.

Our project aims to help students and visitors navigate and become acquainted with Florida Tech's buildings

Approach #1

- Navigate to Any Room With Ease
  - Choose any room from a dropdown list or search by name/ room number. Follow AR directional overlays straight to the destination. Start navigation anywhere in the library and discover points of interest along the way with AR pop-ups that share context and history.

Approach #2

- Take an Interactive Self-Guided Tour
  - Explore the Evan's Library's most important features, such as the Digital Scholarship Labs, reservable private rooms, offices, and more. Learn the history and functionality of each stop through a series of interactive AR pop-ups that'll teach and quiz you as you go. Pause the tour anytime and resume when ready.

Approach #3

- Learn About the Library As You Walk
  - During tours and navigation, pop-ups will appear and feature relevant information, teaching context, and history. Click on pop-ups during tours to advance, and click on links in pop-ups to access the link. Some pop-ups during tours will show a question; click on your answer to advance and receive feedback.

Novel Features/ Functionalities

- Informational AR Pop-ups
  - Appear next to locations like offices and places of interest like statues or resource desks during navigation travel
- AR Navigation of Evans Library
  - AR Navigation will provide a new way for students and visitors to navigate the library
- Self-Guided Tours of Evans Library
  - Currently, the only way for students/visitors to get a tour of the library is with a tour guide, which isn't present normally

Algorithms and Tools

- Engine: Unity
- Framework: AR Foundation (iOS/Android support)
- SDKs: Google ARCore, Apple ARKit
- Languages: C#, TypeScript, Swift, Kotlin
- Data Formats: JSON, YAML, Bash

Technical Challenges

- Limited experience with AR and Mobile Development
  - Our team lacks experience developing a mobile app or working with AR
- Scanning Limitations (Hardware)
  - Ideally
- Integrating Backend and Pathfinding into AR (Unity)

Milestone 1

- Compare and select technical tools: the Engine, AR Framework, SDKs, languages, and Data Formats.
- Resolve technical challenges and learn about them in detail, such as:
- Prepare a demo version of the Android app containing the following features:
- Basic outline of Evans Library containing data for rooms, services, sections, and more to serve as points of interest.
- Compare and select collaboration tools for software development, documents/presentations, communication, and task calendar.
- Create Requirement Document
- Create Design Document
- Create Test Plan

Milestone 2

- Expansion of UI to include:
  - A free roam test function to improve AR place pointing and location tracking.
  - A search option with a drop-down menu of all Points of Interest from a selected location.
  - Easy to read pop-ups for Points of Interest.
  - Auto Pop-up Setting: activate when near or activate upon click
- Improve AR Scan to recognize objects or Points of Interest
- Implementation of Evan Library's different floors as Selected Locations.
- Implementation of help options, including a report-making feature, and how to reach out.
- Fix any bugs as they arise.
- Separate pop-ups for room information and specific object information within a room.

Milestone 3

- Improve the Navigation Function from different points of interest.
- Finish implementing the Evans Library's different floors with compatible multi-floor support.
- Have Points of Interest fully implemented for every level of Evan's Library.
- Implementation of AR Tour: Visit all the highlights of Evans Library with a curated in-app guide.
- Fix any bugs as they arise.

Task Matrix

Task	Dathan	Ethan	Jacob	Vincenzo
Compare and Select Technical Tools	Engine, framework, SDKs	Algorithms	Programming Language	Data Formats, crash reports/ logging
Demo Android App (1 Room AR Demo)	App	UI	AR/ Unity integration, scanning, and Localization	Nav
Resolve Technical Challenges	AR	Algorithms and Integration	Scanning	Localization / Mobile App Development
Compare and Select Collaborative Tools	Programs	Documents	Communication/ task calender	Presentation
Design Document	20%	40%	20%	20%
Requirement Document	20%	20%	20%	40%
Library Outline	25%	25%	25%	25%
Test Plan	40%	20%	20%	20%

Questions?