Product Requirements

UNT AR MAP

Team The Stack
5

Brief problem statement

New students at the University of North Texas often struggle to navigate the large and complex campus—especially during the first weeks of the semester. This leads to frustration, late arrivals, missed classes, and a stressful transition period. While paper maps and digital campus maps exist, they lack intuitive, real-time guidance.

The UNT AR MAP project aims to solve this problem through an Augmented Reality (AR) mobile application that overlays digital navigation markers onto real-world surroundings using the user's smartphone camera. Students can view walking paths, building labels, estimated travel time, and informational prompts directly in AR. This system improves campus orientation, reduces confusion, and helps students feel confident navigating UNT.

System requirements

What system configuration is needed to run your proposed system (including anything third-party that is needed to run your system).

- Mobile application developed with Unity + AR Foundation
- Support for Android (API 29+) and iOS (iOS 13+)
- Backend services hosted on Firebase (user analytics, feature toggles)
- Compatibility with the latest Chrome and Safari browsers for web-based AR preview
- Integration with UNT campus map APIs and building location services
- Mobile device must include a camera, GPS, and internet access

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Users profile

Who is the system intended for? What characteristics should the users have (this can also be a range of things such as reading level, etc.).

- Primary Users: New and transfer UNT students seeking campus navigation
- Secondary Users: Faculty, advisors, and current students
- Characteristics:
  - Must own a smartphone with camera + GPS
  - Comfortable with mobile apps (no prior AR experience required)
  - Willing to allow location + camera permissions
  - Reading level: College undergraduate and above

List of Features

Feature ID	Feature Description
F1	Registration/Login using UNT credentials
F2	Real-time AR Navigation with directional arrows
F3	Search for buildings, dining halls, services, and landmarks
F4	Event Notifications based on proximity
F5	Accessibility Mode (text-to-speech, high contrast overlays)
F6	Heatmap to show crowded areas on campus
F7	Offline Mode with cached map/navigation data
F8	Database Integration for storing user preferences and campus data

Functional Requirements (User Stories)

List the Priority as 1 (High Priority - Critical) to 3 (Low Priority – Would be nice if we have time)

No.	User Story Name	Description	Priority

R1	Registration/Login	As a user, I want to log in with UNT credentials so that I can receive personalized recommendations.	2
R2	AR Navigation	As a user, I want to see step-by-step AR directions so I can reach my campus destination.	1
R3	Location Search	As a user, I want to search for any campus building or service so I can find it quickly.	1
R4	Event Notifications	As a user, I want to be notified about nearby events so I don't miss relevant campus activities.	3
R5	Accessibility Mode	As a visually impaired user, I want AR text-to-speech so I can use the system effectively.	1
R6	Heatmap Integration	As a user, I want to see where the busiest areas are on campus so I can plan my route better.	2
R7	Offline Mode	As a user, I want cached navigation so	2

		I can still use the app without an internet connection.	
R8	Database Connectivity	As a user, I want the app to store and load campus data and my preferences from a secure database.	1

Non-Functional Requirements

Describe any constraints or cross-cutting characteristics of the system in a manner that is clear, specific, and testable. Each requirement should have a unique identifier (e.g. NF1, NF2,..). Only present those that apply to your system. Categories include but are not limited to:

- NF1 – Security: All authentication must use secure UNT SSO (Single Sign-On) with encrypted data storage.
- NF2 – Reliability: The system shall maintain 99% uptime during peak usage (start of semester).
- NF3 – Usability: First-time users should be able to complete a navigation task in under 2 minutes without training.
- NF4 – Cross-Platform Compatibility: Must run on both iOS and Android without significant feature differences.
- NF5 – Accuracy: Navigation directions must remain within 3–5 meters of actual building entrances.
-NF6 Database Performance: Database queries should execute within 2 seconds under normal load conditions.
NF7 Data Integrity: All stored locations and user data must remain consistent and backed up weekly.

Sponsor Requirements

I have read and approve the material in this document.

If there is no external sponsor, the TA or instructor will sign it for accuracy/scope.

_____	_____	_____
Print Name	Signature	Date