

Find Closest Defibrillator

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Table of contents

Introduction3

Research Process.....3

Background Material and environments:4

 Xcode –3

 Swift –3

 SwiftUI –3

 MapKit -3

 Core Location -4

 AVFAudio -4

 ARKit Scanner -4

 SceneKit: –4

 Application Overview-4

 Components –4

 Augmented Reality-4

 Future ideas for development -5

 Actual App View-6



Introduction:

In this project we introduce a new mobile App that navigate user to the closest Defibrillator in the Technion Campus.

Using our App in The Technion Campus, the user would get Navigation assistance to the closest defibrillator based on his current location. The app provides graphics directions on The User`s Camera along with his current location and a 2D map that shows his location and the path to the Chosen Defibrillator to his Location.

In Addition to the 2D and 3D assistance, Voice Assistance is also available which makes sure to notify the user vocally to the next direction he needs to take until he reaches the Defibrillator.

Research Process:

1. Our first milestone was to implement a simple mobile app that display the current latitude and longitude of the user on the user camera.
2. The second research stage was to find the right platforms and APIs That would integrate in Unity.
 - 2.1. We started with MapBox Api that provides Geographic Location APIS for navigation and displaying AR objects on the map. But later we found out that the services are no longer supported with latest Unity Versions and Vuforia.
 - 2.2. Afterwards, we moved towards GoogleAPI. But also, here we found out that the one of the services is deprecated. And the latest one was still new and not enough Documentation is provided for our current level.
3. After This stage, we decided that we need to improve our level of knowledge with Unity and AR. So, we took a Udemy course that teaches both on Unity and Wikitude. In this Course we had the chance to work on various interesting projects and improved our skill and knowledge in AR. [Course link](#).
4. In this stage we have found out about Apple Development Environment. What indeed amazed us, that we had the opportunity to implement AR and build mobile App with the ability to simulate the app. All in products and frameworks developed and owned by Apple. Which makes integration between each part of the app easier and smoother. That is an addition to the well documented APIs and various learning resources.

Background Material and environments:

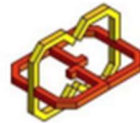
Xcode: Xcode is Apple's IDE, made for producing software across Apple's Xcode includes everything you need to develop, test, and distribute apps across all Apple platforms. Leverage the simplicity and power of Swift and SwiftUI with a new multiplatform app experience

Swift: Swift is an open source robust and intuitive programming language created by Apple for building apps Across Apple's products

SwiftUI: SwiftUI is an Apple product used for building user interfaces for Apple's products using the power of Swift.

Augmented reality (AR): is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory. AR can be defined as a system that incorporates three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects

MapKit: MapKit is a framework that is used to display map or satellite imagery within your app, call out points of interest, and determine placemark information for map coordinates.



MapKit also provides the ability to add LookAround capabilities to enable users to explore locations at street level. And also respond to user interactions with well known points of interest.

Core Location: Core Location provides services that determine a device's geographic location, altitude, and orientation. The framework gathers data using all available components on the device, including the Wi-Fi, GPS, Bluetooth, magnetometer, barometer, and cellular hardware.

AVFAudio: AVFAudio is an Apple's framework that is used to play, record, and process audio.

ARKit Scanner: In order to scan and detect real-world 3D objects we used ARKit Scanner which gives you the opportunity to scan, detect and export a reference object file. We used that reference object file in the Reality Composer to add the required text and animation.

SceneKit: SceneKit combines a high-performance rendering engine with a descriptive API for import, manipulation, and rendering of 3D assets.

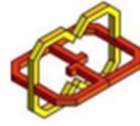
SceneKit requires only descriptions of your scene's contents and the actions or animations you want it to perform.

Reality Composer: Apple's Reality Composer app is used for constructing 3D compositions and augmented reality (AR) experiences. You combine 3D models, audio, and other assets—along with a description of how these objects behave—into a file that you add to your RealityKit-

enabled app. You can also export your composition as a lightweight AR Quick Look experience that lets users place and preview content.

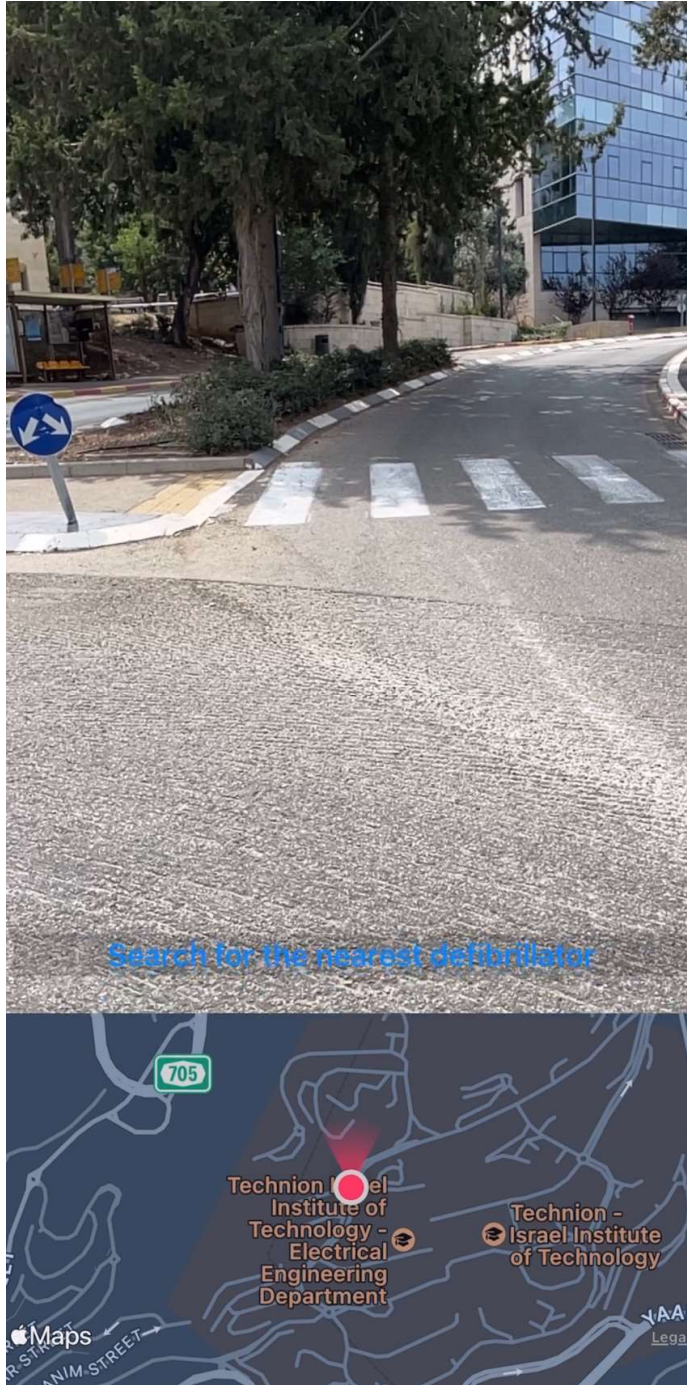
Future ideas for development:

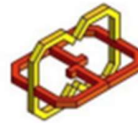
- 1- Add The ability for authorized users to add defibrillator's location in the Technion and other locations.
- 2- Adding the ability to update the user's path upon taking a wrong way.
- 3- Add a feature in which users can contact Emergency Services.
- 4- Expand the current App to support other services for the Technion community. in which users can navigate to the desired Location (Libraries, Restaurants, etc...).
- 5- Indoor Navigation.



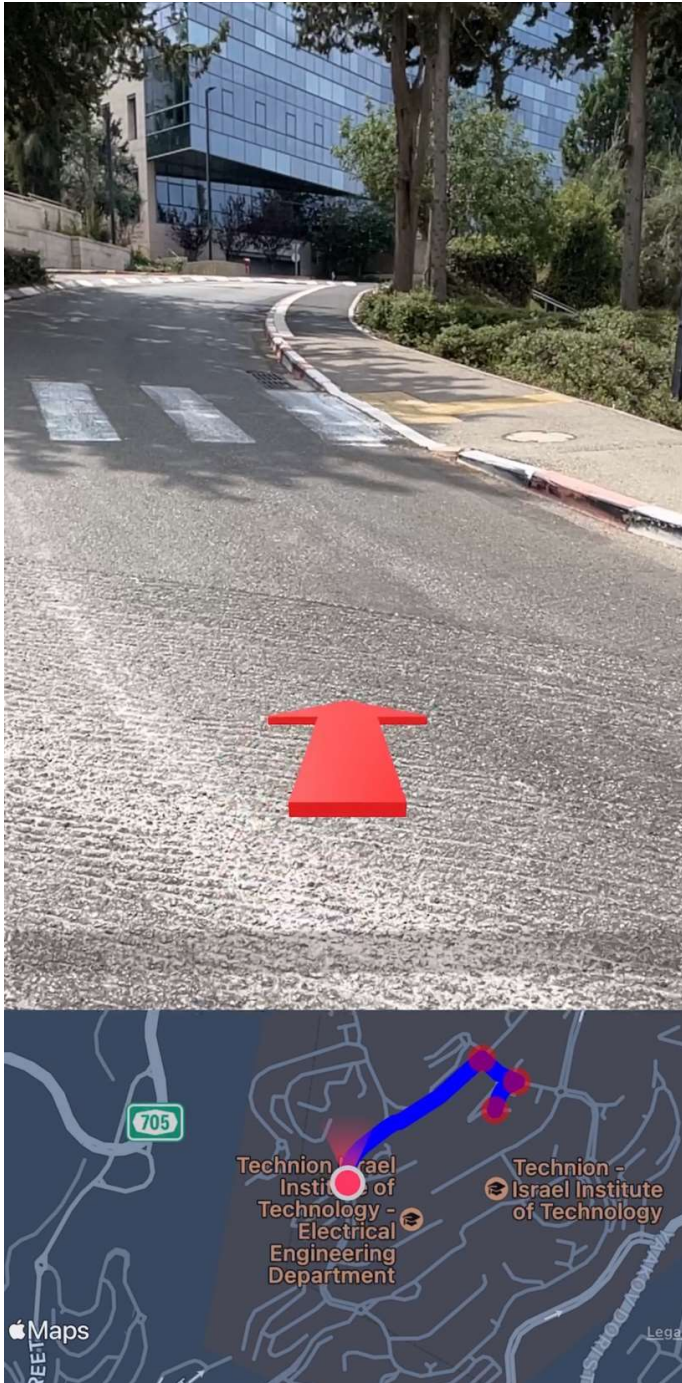
Application Overview:

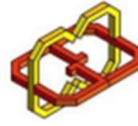
- 1- Opening Scene: in which user can view his location.





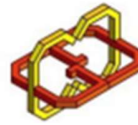
- 2- By Clicking Search for closest Defibrillator. The Navigation Process starts. And the map view will be updated to the closest Defibrillator along with live AR Arrow will be shown on the camera for navigation. In addition to voice guidance for the right direction.



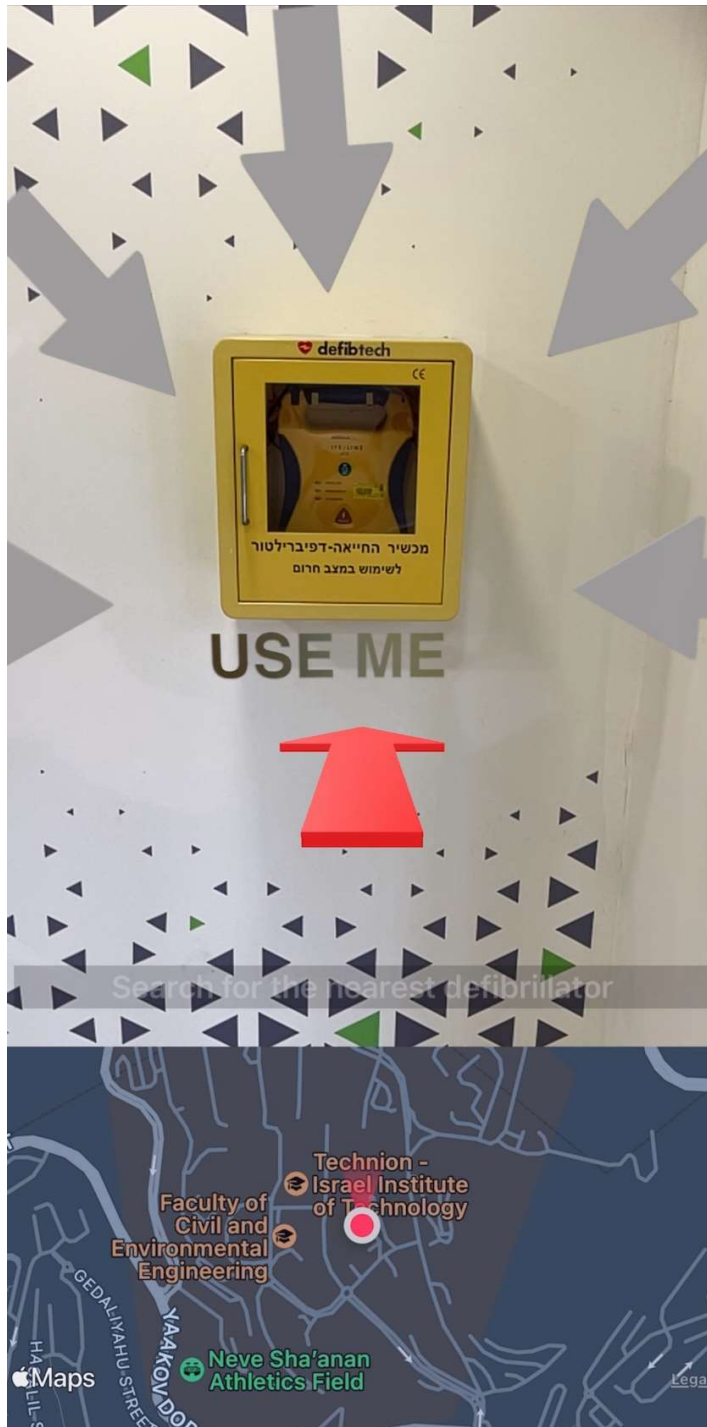


- 3- Whenever the user needs to change his direction. Appropriate arrow will be displayed. Along with Voice Assistance.



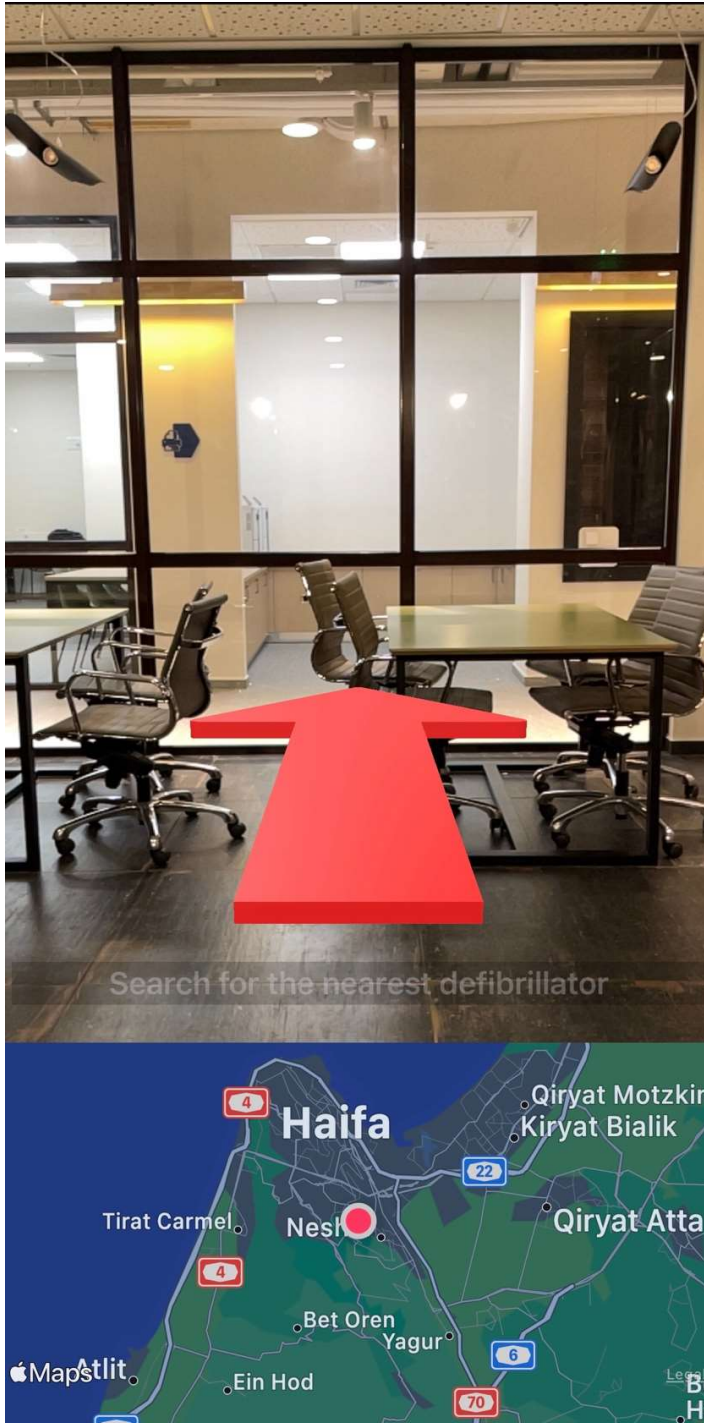


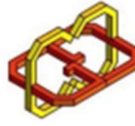
- 4- Upon Arrival to the Closest Defibrillator. Multiple Arrows will pop in the user camera pointing to the direction of the Defibrillator (with live animation).





5- In any time during the navigation the user Can resize the Arrow.





6- The user will have the ability to Zoom In/Out The map.

