

CSE476: MOBILE APPLICATION DEVELOPMENT

YEDITEPE UNIVERSITY

FALL 2023

TERM PROJECT – DUE DATE JANUARY 6TH, 2024

As term project you are required to select one of the projects below and implement an Android application. You can make use of all the material given to you so far—including web services, data parsing, layouts, views, GUI elements, activities, intents and most probably debugging tools such as Android Profiler.

(i) 15 Ball Pool (100 points)

This project requires you to implement a virtual pool game, using GUI components (Fig. 1). This is a graphically intense application where the player will have an overview of pool table and use his/her cue to shoot the balls with the right angle. The speed of the balls bouncing from the table cushions should be adjusted according to their angle. The player should be able to adjust the point/angle that the cue tip will hit a ball.



Fig. 1: Android 15 Ball Pool Game

(ii) Location-aware Augmented Reality Sniper (90 points)

In this project you are required to implement a location-aware, augmented reality shooter game for outdoors. There should be two players in this game with their own territories and both sides should aim to kill all drones of the other player and reach to other user's flag point (headquarters). All drones should be visible through the users phone screen and should be able to shoot them by targeting and pressing a button on the phone (Fig. 2). Game management should be handled by a web service and user location sensing should be through GPS.

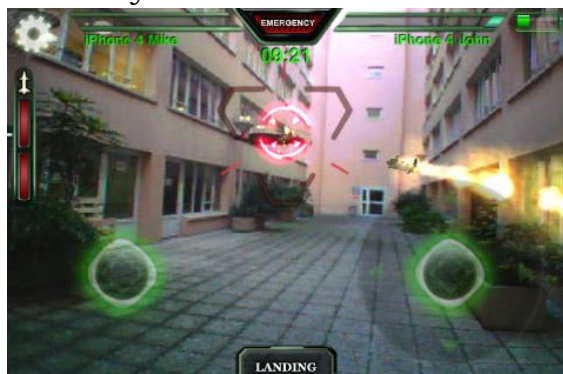


Fig. 2: Location-aware Augmented Reality Sniper

(iii) Motor biker App (60 points)

In this option, you will be required to implement a sensor-enabled motor biker app (Fig. 3). The game should be controlled via motion sensors and the players should avoid crashing into cars or to the pavement on both sides of the road. The motorbike should accelerate while the user's finger is on the screen and reduce speed when no fingers are touching to the screen. The game should have at least three levels – novice, intermediate and advanced. In the advanced level, the cars on the road should change lanes more frequently and more swiftly to make harder to steer the motor bike.

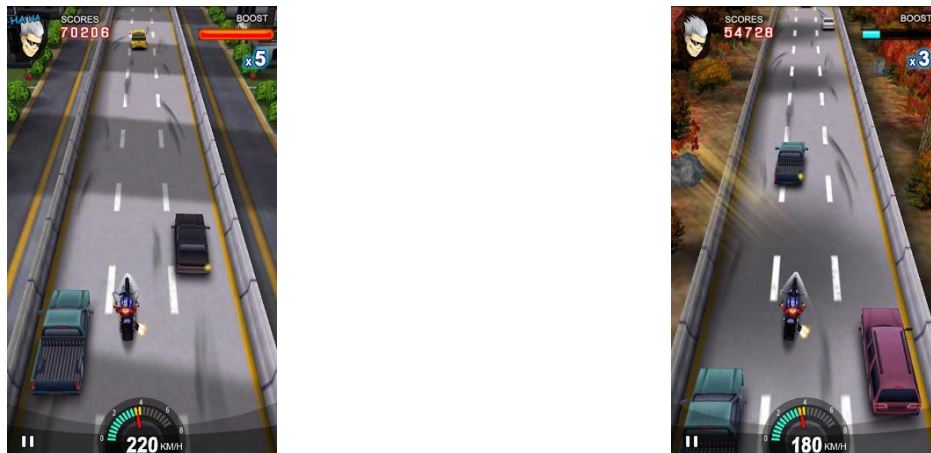


Fig. 3: Motor biker app

(iv) Price Runner (Price Checker App) (80 points)

In this option, you are required to develop a barcode-assisted price-runner (price comparison) application using your previous experience. In this project you are expected to implement a mobile barcode scanner application that can identify the item in hand by using its barcode and compare its prices with the ones over the Internet (Fig. 4). The application search for the available online and offline outlets and list the finding according to price and proximity.

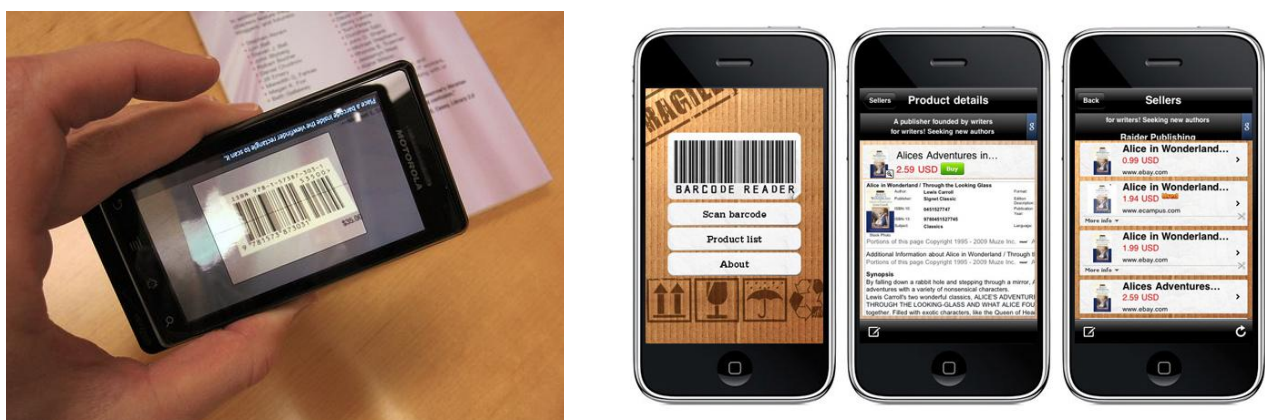


Fig. 4: Price comparison app example screenshots

(v) Socket Tunnel App (100 points)

In this option, you are required to implement a socket tunnelling application that can bypass any port filtering and deep packet inspection (DPI) router and firewalls. This mobile application should be able to bypass firewalls for both secure and non-secure services. Thus, your app will require to be used in conjunction to a socket tunnelling server. To support this duality, a client server model should be followed and the TCP protocol utilized.

As can be seen in Fig. 5, the application will encrypt the packets using SSL/TLS and either will pass them to the Socket Tunnel Server (sTunnel), which from there they will be forwarded to the final destination or directly send them to the server.

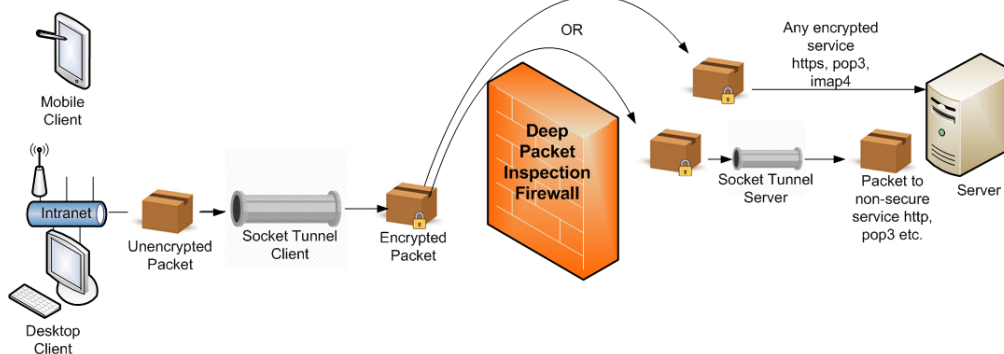


Fig. 5: Socket Tunnelling Architecture

(vi) Screen Streamer App (100 points)

The last term project option involves the development of a screen casting/streaming app (Fig. 6a). As you all know, there are existing proprietary streaming applications and protocols such as Miracast, Chromecast, AirPlay that enable content streaming and screen casting (Fig. 6b). However, all of them involve either a proprietary software and/or hardware. In this project, you are required to combine your mobile application development skills with your existing programming skills and implement a screen casting application that will talk to Raspberry Pi device which will be attached to a projector. Therefore, you will be required to implement (i) an Android application that will run on the mobile device and (ii) C application that will run on the Raspberry Pi. *Note: You do not need a Raspberry Pi device to undertake this project. You can install Raspbian (Raspberry Pi OS) on a virtual machine.*



(a)



(b)

Fig. 6: (a) Android app streamed on a TV; (b) Chromecast setup screen

Submit your project source code in a zip file, which has your student number as name, through the YULEARN latest by the end of Saturday, January 6th, 2024. All submitted source files will be checked for plagiarism among classmates and with any existing open source code available on the Internet. Furthermore, all students will be required to demonstrate their work for 15 minutes. DO NOT submit somebody else's work.