

# MULTIPLAYER FPS BLOCKCHAIN GAME

CENG 3550, DECENTRALIZED SYSTEMS AND APPLICATIONS

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## Abstract

Today decentralized systems are more famous and useful. Moreover, using fields of these systems are increasing every day. Video game field is that it is one of them.

## 1 Introduction

Our project is a demo video game project with using decentralized systems. It is a multiplayer FPS game and the game economy provided with Ethereum network. Main idea of usage is that when any player kills to another, winner side takes some amount of Ethereum from dead side.

## 2 Fundamentals

### 2.1 Used Systems and Technologies

- Unity game engine (For game development side)
- Playfab (Online user and user data system)
- Photon (Realtime fps side)
- Netherium (Unity Ethereum Library)
- Infura (To use ethereum network)

## 3 Implementation

Project link: [Click to go Github Link!](#)  
There are four part of this project:

### 3.1 Multiplayer User Data System : Playfab

Our project provides user registration and login system, and also using this Playfab, we are storing important data according to etherium transfer operations. We are simply collecting address and private key of user.

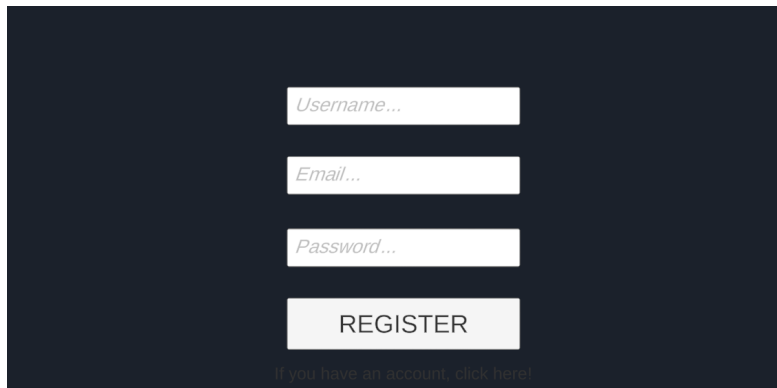
The image shows a registration form on a dark blue background. It features three white input fields stacked vertically, labeled 'Username...', 'Email...', and 'Password...'. Below these fields is a white button with the text 'REGISTER'. At the bottom of the form, there is a link that says 'If you have an account, click here!'.

Figure 1: Register screen

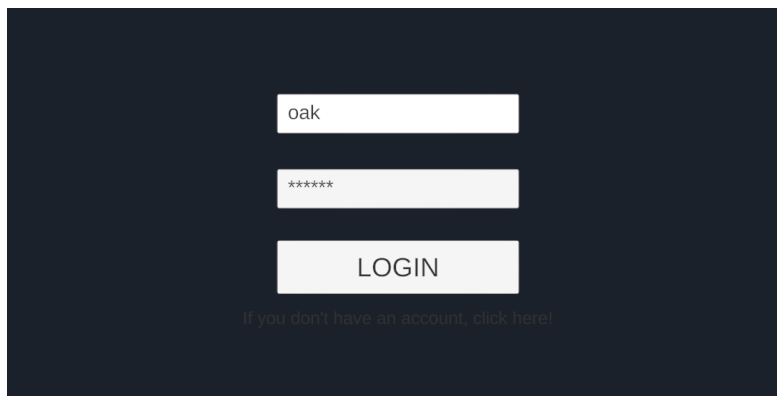
The image shows a login form on a dark blue background. It features two white input fields stacked vertically. The first field contains the text 'oak' and the second field contains '\*\*\*\*\*'. Below these fields is a white button with the text 'LOGIN'. At the bottom of the form, there is a link that says 'If you don't have an account, click here!'.

Figure 2: Login screen

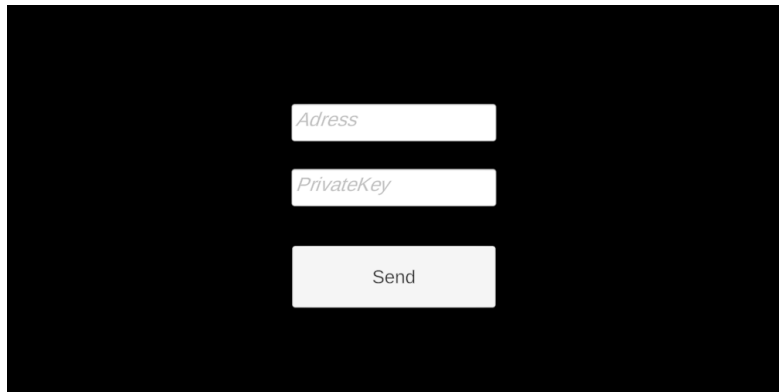


Figure 3: Address and private key screen

### 3.2 Realtime Multiplayer System : Photon

Photon is realtime network provider of this project. We are using photon to play online FPS game. And also important thing is that we are getting rival data using photon after that we are using the data to get rival's adress and private key.



Figure 4: Lobby

### 3.3 FPS game

Our game is a FPS game. Game materials, FPS mechanics prepared to use other networking and decentralized systems.



Figure 5: In game

### 3.4 Ethereum Transactions : Netherium

In Unity, we used Netherium library to do ethereum transactions. Our ethereum network is Ropsten network for demo version and also we are using Infura to provide Ethereum network.

Transaction Details	
Overview	State
[ This is a Ropsten Testnet transaction only ]	
Transaction Hash:	0x97aca97a4f386720f3b7729a090a3aca6672ad99b599583388f4b83ed16b8e75
Status:	Success
Block:	10525333 142 Block Confirmations
Timestamp:	46 mins ago (Jun-27-2021 09:22:54 PM +UTC)
From:	0x88144534bd291b9c3d7bdb9a92d7270566f5622d
To:	0x88144534bd291b9c3d7bdb9a92d7270566f5622d
Value:	0.1 Ether (\$0.00)
Transaction Fee:	0.000042 Ether (\$0.00)
Gas Price:	0.000000002 Ether (2 Gwei)
<a href="#">Click to see More</a>	

Figure 6: A transaction from game.

## 4 Conclusion

Decentralized systems will change our future so that we need to be a part of these systems. Video games are different parameters when we compare with other software developments, anyway we can implement decentralized systems to make more secure and useful systems for games.

## References

<https://docs.microsoft.com/en-us/gaming/playfab/sdks/unity3d/>  
<https://infura.io/>  
<https://metamask.io/>  
<https://faucet.ropsten.be/>  
<https://www.devteam.space/blog/how-blockchain-could-redefine-the-gaming-industry/>