UMER MAJEED

Web3 Engineer

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SUMMARY

Innovative Web3 Developer and Ph.D. candidate in Computer Science & Engineering with expertise in Solidity, Python, JavaScript, and Node.js, specializing in blockchain technologies and DApps. Proven track record in implementing smart contracts, DAOs, ERC-20, and ERC-721 projects. Published researcher dedicated to advancing federated learning and blockchain applications. Aim to bring cutting-edge expertise to a dynamic Web3 development team. Adept in multiple languages and frameworks, poised to contribute valuable insights to the field.

SKILLS

PLs & Frameworks: Solidity, Python, JavaScript, Node.js, R, TypeScript, SQL, React.js, Next.js.

Technologies: Remix, hardhat, brownie, Web3.js, ethers.js, MetaMask, Infura, Alchemy, Ethernal, Chai, Ganache, surya, openzeppelin-solidity, Truffle.

Familar OS: Ubuntu, Windows

KEY RELEVANT PUBLICATIONS - - -

Umer Majeed et al., "DAO-FL: Enabling Decentralized Input and Output Verification in Federated Learning with Decentralized Autonomous Organizations," TechRxiv. Preprint, Dec 2023.
Developed **DAO Membership Tokens (DAOMTs)** for governance, implementing **mintable and soul-bound tokens** to facilitate decentralized decision-making. Engineered a decentralized framework for **input and output verification** in federated learning, leveraging **DAOs and ERC-721 tokens** to enhance **security and transparency**.

Umer Majeed et al., "FL-Incentivizer: FL-NFT and FL-Tokens for Federated Learning Model Trading and Training," IEEE Access, Jan 2023.
Incentivized learners to submit local models to the federated learning server by implementing a **reward system** using **ERC-20 tokens** for participants. Developed a mechanism to commercialize the federated learning global model by tokenizing it as **ERC-721 based dynamic NFT**.

Umer Majeed et al., "ST-BFL: A Structured Transparency empowered cross-silo Federated Learning on the Blockchain framework," IEEE Access, Nov. 2021.
Developed a **blockchain-based framework** enhancing data privacy in federated learning through **structured transparency** and **homomorphic encryption**. Implemented **smart contracts** and output verification mechanisms to ensure accountability and integrity in collaborative machine learning processes.

Umer Majeed et al., "Blockchain for IoT-based Smart Cities: Recent Advances, Requirements, and Future," Journal of Network and Computer Applications, Vol. 181, pp.1-22, May 2021.
Conducted a comprehensive literature review to formulate blockchain genesis and enhancements in **blockchain technology** in terms of **consensus algorithms** and platforms. Identified applications and challenges for **blockchain-enabled smart cities**.

RELEVANT CERTIFICATIONS AND MOOCS -

Blockchain Specialization - University of Buffalo - Coursera - - -
This specialization provides a comprehensive overview of essential concepts in **Blockchain** technology. Participants delve into the foundations of **Cryptography**, exploring techniques that ensure secure transactions and data integrity. They gain insights into **Consensus Protocols** such as Proof of Work (PoW) and Proof of Stake (PoS), which are crucial for maintaining the integrity of decentralized networks. The program emphasizes the development and deployment of **Smart Contracts** using **Solidity**, focusing on best practices for creating secure and efficient contracts. Additionally, participants learn to build and manage **Decentralized Applications (Dapps)** leveraging frameworks like **Truffle Suite** and platforms such as **Hyperledger Fabric**. The curriculum also covers important topics like **Blockchain Security**, ensuring a solid understanding of vulnerabilities and protective measures, while providing a thorough overview of the broader **Blockchain Ecosystem**.

1. Blockchain Basics - Completed - Dec. 2018 -
2. Smart Contracts - Completed - July 2019 -
3. Decentralized Applications - Completed - Jan. 2020 -
4. Blockchain Platforms - Completed - Feb. 2020 -

Ethereum Developer Degree - learnweb3.io - In Progress -

1. ***Freshman Graduate*** - - *Fundamentals of **blockchain**, **Ethereum**, and **Solidity** for building **dApps** and understanding **decentralized systems**.*
2. ***Sophomore Graduate*** - - *Deep understanding of **gas**, **mining**, **PoW**, **PoS**, and **EVM**. Learn to build full **dApps** with **custom contracts**, **NFTs**, **DAOs**, **ICOs**, and **DEXs** using **React** and **Next.js**.*
3. ***Junior*** - In Progress - *Exploring **Layer 2** solutions, **ENS** integration, local **smart contract testing**, **IPFS**, **Ceramic**, **Chainlink VRF**, and **The Graph's Indexer**.*
4. ***Senior*** - In Progress - *Mastering advanced Web3 topics including **Merkle Trees**, **Flash Loans**, **Smart Contract Security**, **MEV**, and **Gas Optimization**.*

Web3 and Blockchain Fundamentals - INSEAD - Coursera - Audit Completed - Feb. 2024 -
This course covers essential concepts in **Web3**, including the foundational technologies that support decentralized applications, the roles of **smart contracts**, **digital assets**, and **governance tokens** within the ecosystem. Participants explore the implications of **DAOs** (Decentralized Autonomous Organizations) and identify key **blockchain design principles** along with the challenges associated with implementing blockchain technology in real-world scenarios.

Cryptography, Private & Secure AI/Data Science Courses - OpenMined -

1. ***Our Privacy Opportunity*** - Completed - Mar. 2021 - Explore structured transparency, **privacy techniques**, and the **privacy-transparency trade-off**.
2. ***Foundations of Private Computation*** - Ongoing - Progress 80% - Implement **federated learning**, **secure multi-party computation**, **homomorphic encryption**, and **differential privacy**.
3. ***Introduction to Remote Data Science*** - Completed - Feb. 2022 - Use **remote execution tools**, deploy **Domain Nodes**, and apply **privacy-preserving techniques** for distributed data science.

IBM Blockchain Foundation for Developers - IBM - Coursera - Completed - Aug. 2018 - 🌐 - ✹

This course provides a comprehensive overview of **business networks** utilizing blockchain technology, emphasizing **Hyperledger Composer** and **Hyperledger Fabric**. Participants learn about essential concepts, key use cases, and the process of transferring assets within a blockchain network. The course also covers **access control** mechanisms, **network consensus** methods, and the roles and responsibilities of individuals involved in building and maintaining a blockchain business network.

Crash Course on Python - Google - Coursera - Completed - March 2020 - 🌐 - ✹

This course offers a comprehensive introduction to **Python syntax**, focusing on programming fundamentals and automation tasks relevant to IT roles. Participants learn about essential concepts such as **Python automation**, **code reuse**, and **refactoring**. The curriculum covers error handling techniques and includes a structured **problem-solving framework** to tackle complex programming challenges. Hands-on exercises enable learners to apply their skills in writing efficient Python scripts and manipulating data effectively.

PROJECTS & PORTFOLIO - 🌐

Whitelist DApp - 🌐, GitHub - , , Sepolia Ether Scan - 🌐

This DApp allows users to whitelist up to **10 addresses** for the presale of **NFTs**. It is built using **React.js**, **Next.js**, and **ether.js**, featuring **Web3Modal** integration for seamless connection to users' wallets.

NFT Collection DApp - 🌐, GitHub - , , Sepolia Ether Scan - 🌐

This DApp mints up to **20 NFTs**, allowing only whitelisted addresses from the above DApp to mint during the presale period. Once the presale ends, it opens up for public minting. Built using **React.js**, **Next.js**, and **ether.js** with **Web3Modal** for wallet connections.

Basic DApp - 🌐, GitHub - , Sepolia Ether Scan - 🌐

A basic DApp that sets a person's mood in a smart contract. It utilizes **ethers.js** for interacting with the Ethereum blockchain, allowing users to store and retrieve mood data securely.

ERC20 Based Cryptocurrency - GitHub - , Sepolia Ether Scan - 🌐

This project involves creating a fungible token adhering to the **ERC-20 standard** as a custom cryptocurrency. Developed using **Remix IDE** and **MetaMask** for deployment and testing.

Basic NFT Contract - GitHub - , Sepolia Ether Scan - 🌐

This project focuses on building a basic **NFT (Non-Fungible Token)** contract on the Ethereum network using **Hardhat** and **OpenZeppelin Contracts**, demonstrating the creation and management of NFTs compliant with the **ERC721 standard**.

EDUCATION

2017 - Present — **Master & Ph.D. (Combined) in Computer Science & Engineering** — **CGPA 4.11/4.3**
Department of Computer Science & Engineering, Kyung Hee University, Yongin, South Korea

2011 - 2015 — **BS Electrical (Telecommunication) Engineering** — **CGPA 3.83/4.00**
National University of Sciences & Technology (NUST), Islamabad, Pakistan

EXPERIENCE

2015 – 2016 — **PHP developer** — **Artologics, Islamabad, Pakistan**

- Developed robust back-end applications using Core PHP and CodeIgniter framework.
- Implemented jQuery and JavaScript to facilitate smooth communication between the user interface and server-side components via AJAX requests, enhancing the interactivity of web application.
- Employed SQL queries to interface with MySQL databases, ensuring data integrity and reliability while developing robust solutions for efficient data management.

`PHP / SQL / CodeIgniter / jQuery / AJAX / JavaScript / APIs`

BADGES

Founder's Badge - LearnWeb3 Badges
www.opensea.io/assets/matic/0x60f028C82f9f3bF71e0C13fE9e8E7f916b345C00/262556
The founder's badge was airdropped to students who were early adopters of LearnWeb3.

LANGUAGES

English - Proficient (written and verbal), **Urdu** - Native, **Korean** -Beginner (TOPIK Level 2)