UMER MAJEED

Web3 Engineer

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scholar.google.com/citations?user=LrsLEJgAAAAJ
Citations: 600+

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

⋆ DAOs
⋆ ERC-721
⋆ Multi-Signatures Contract
⋆ Non-Transferable Tokens (NTTs)
⋆ IPFS
⋆ Hardhat

Umer Majeed et al., "DAO-FL: Enabling Decentralized Input and Output Verification in Federated Learning with Decentralized Autonomous Organizations," TechRxiv. Preprint, Dec 2023. **www.github.com/umermajeedkhu/DAOFLcode/tree/main/contracts**

- Developed DAO Membership Tokens (DAOMTs) for governance, implementing mintable and soulbound tokens to facilitate decentralized decision-making and member management within DAOs.
- Engineered a decentralized framework for input and output verification in federated learning, leveraging DAOs and ERC-721 tokens to enhance security and transparency.

ERC-20
ERC-721
hardhat
Ethereum
Surya
IPFS

Umer Majeed et al., "FL-Incentivizer: FL-NFT and FL-Tokens for Federated Learning Model Trading and Training," IEEE Access, Jan 2023 **www.github.com/umermajeedkhu/FL-Incentivizer/tree/master/**

- 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.

⋆ Structured Transparency
⋆ Homomorphic Encryption
⋆ Input Privacy
⋆ Output Privacy
⋆ Output Verification
⋆ Flow Governance

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.

⋆ Consensus Algorithm
⋆ Blockchain technology
⋆ Blockchain Platforms
⋆ Smart contracts
⋆ Smart city

Umer Majeed et al., "Blockchain for IoT-based Smart Cities: Recent Advances, Requirements, and Future," Journal of Network and Computer Application, Vol. 181, pp.1-22, May 2021.

- Conducted a comprehensive literature review to formulate blockchain genesis, inception, and further enhancements in blockchain technology in chronological order in terms of constituent technologies, consensus algorithms, and blockchain platforms.
- Identified and discussed applications, case studies, and data-centric requirements and challenges for blockchain-enabled smart cities.

RELEVANT CERTIFICATIONS AND MOOCS

⋆ React/ Next.js
⋆ ICO/DAOs
⋆ NFTs / DEX
⋆ Layer 2
⋆ ENS/ IPFS
⋆ Ceramic
⋆ Chainlink VRFs
⋆ Smart contract testing
⋆ Smart contract Security
⋆ Graph's Indexer
⋆ Merkle Trees

Ethereum Developer Degree - learnweb3.io - in progress **opensea.io/umermajeed**

- Freshman Graduate - LearnWeb3 DAO Graduates
  Fundamentals of blockchain, ethereum, solidity, web3, dApps and crypto technology.
- Sophomore Graduate - LearnWeb3 DAO Graduates
  Deep understanding of gas, mining, PoW, PoS, EVM, Solidity, React and Next.js. build full dApps with custom contracts, NFTs, DAOs, ICOs, and DEX.
- Junior - in progress - *Explore Layer 2 solutions, ENS integration, local smart contract testing, IPFS, NFTs, Ceramic, Chainlink VRF, and The Graph's Indexer.*
- Senior - in progress - *Master Web3 essentials: Merkle Trees, Flash Loans, Smart Contract Security, MEV, Gas Optimization, Metatransactions, and more.*

⋆ Web3
⋆ DAOs
⋆ Governance tokens
⋆ Smart contracts
⋆ Digital assets
⋆ Blockchain design principles

Web3 and Blockchain Fundamentals- INSEAD- Coursera - Audit Completed -Feb, 2024
https://www.coursera.org/learn/web3-blockchain-fundamentals

- Understanding the foundational technology of Web3 and its implications for decentralized systems.
- Exploring the various types of digital assets and their roles in blockchain ecosystems.
- Identifying the design principles and challenges associated with implementing blockchain technology in real-world scenarios.

⋆ Fundamentals
⋆ Cryptography
⋆ Consensus Protocols
⋆ Types of Blockchains
⋆ Solidity
⋆ Smart Contracts
⋆ Dapp Development
⋆ Truffle Suite
⋆ Hyperledger Fabric
⋆ Blockchain Security
⋆ Blockchain Ecosystem

Blockchain Specialization - University of Buffalo - Coursera
https://www.coursera.org/account/accomplishments/specialization/R7EPJZBHSMGH

- **Blockchain Basics - Completed - Dec. 2018 -** ✹ - Understand the core principles of blockchain technology, including its structure, cryptographic security, and consensus mechanisms like PoW and PoS.
- **Smart Contracts - Completed - July, 2019 -** ✹ - Learn to design, code, and deploy smart contracts using Solidity, and implement best practices for secure and efficient contract development.
- **Decentralized Applications (Dapps) - Completed - Jan. 2020 -** ✹ - Develop end-to-end Dapps, integrate with front-end interfaces using MetaMask, and deploy using Truffle Suite.
- **Blockchain Platforms - Completed - Feb. 2020 -** ✹ - Explore platforms like Hyperledger Fabric and Microsoft Azure, and analyze decentralized solutions like IPFS and Hashgraph.

⋆ Business Networks
⋆ Hyperledger Composer
⋆ Hyperledger Fabric
⋆ Access Control
⋆ Network consensus

IBM Blockchain Foundation for Developers- IBM- Coursera - Completed -Aug, 2018
www.coursera.org/account/accomplishments/verify/6GA4B4BZQFK7

- An overview of blockchain and distributed ledger systems in a business environment. It covers important concepts, key use cases, and the transfer of assets in a blockchain network.
- The structure and components of Hyperledger Composer and Fabric, and how to model, build, and interact with a blockchain application.
- Roles and responsibilities of those involved in building and maintaining a blockchain business network.

⋆ Privacy Techniques
⋆ Federated Learning
⋆ Secure Multi-Party Computation
⋆ Differential Privacy
⋆ Remote Execution

Cryptography, Private & Secure AI / Data Science Courses - OpenMined
https://courses.openmined.org/courses

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

⋆ Python Syntax
⋆ Python automation
⋆ Code reuse
⋆ Refactoring
⋆ error handling
⋆ Problem solving framework

Crash Course on Python- Google - Coursera - Completed - March, 2020
www.coursera.org/account/accomplishments/verify/FEZNE2LWZJC2

- Comprehensive introduction to programming and Python basics for automation tasks in IT roles.
- Covers syntax, data types, loops, and advanced string manipulation with hands-on exercises.
- Equips learners with skills to write Python scripts and solve complex programming challenges effectively.

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)