MODULE 5-1 JOURNAL

Computer Science Trends and Artifact Update

CS499 Computer Science Capstone

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October 13, 2024

Over the previous many decades, Computer Science evolved by leaps and bounds through constant evolution, innovation, research, breakthroughs, modern solutions, and the advent of new aspects and technological advancements. There are many trends projected by new domains such as Artificial Intelligence and Machine Learning, Quantum Computing, Edge Computing, Blockchain, Cryptography, and Cyber security. For today's Journal, I would prefer to choose Artificial Intelligence and Machine Learning along with blockchain and cryptography. These two new trends revolutionized Computer Science and affected every corner of human life from Social to financial to the extent that things were never as they were before these trends and technologies. Artificial Intelligence and Machine learning changed computer Science and everything is now influenced by this trend. This trend and technology impacted human life deeply by evolving healthcare, finance, and transportation by solving various dominant problems that were otherwise hard to solve. Areas like Natural Language Processing (NLP), Computer Vision, Deep Learning, and Neural Networks help develop smart agents and machines to assist in decision-making, predictions, automation, and solving complex tasks. The second trend that I choose is blockchain and cryptography. With the evolution of web3, the solidity platforms help evolve cryptocurrencies and platforms, decentralized finance (DeFi), supply chain management, and digital identity management. The Web 3 and blockchain technologies are decentralized, secure, reliable, scalable, and distributed systems that help evolve efficient and secure systems. Cryptography is part of this blockchain technology and evolved rapidly.

Each of these trends AI & ML, Blockchain, and Cryptography have a great impact on the lives of workers, consumers, people, and citizens. Artificial Intelligence and Machine learning are used to process Customer and consumer data to find patterns and analyze dataset to help personalize user experience and products. These technologies provide great insight to understand consumer needs and help adopt the technologies to personal the products according these patterns and insights. This personalization is already evident in social media sites and content providers such as Facebook, Twitter, Netflix, YouTube,

and Amazon. The E-commerce web applications are now using AI and ML to understand consumer needs and provide optimized search and recommendations based on user visits and buying patterns. The field of healthcare is greatly impacted by AI and ML and assists in real-time analysis of health issues based on historical patient data. In the field of finance and banking Artificial Intelligence and Machine learning help in fraud detection and automation of various other fields. The Personal Assistants and Virtual Assistant are developed with the help of these technologies. These technologies are used in automation to avoid repetitive tasks and help enhance decision-making strategies by recognizing patterns and insights existing in the historical data. Public services, smart cities, and smart homes are products of these advanced technologies used to improve the lives of citizens.

Blockchain played a vital role in improving Consumer, workers, and citizens' user experience by introducing significant advancements in ownership of digital assets, NFTs (Non-fungible tokens), secure payments by using decentralized (DeFi) Platforms, and transparency along with anonymity. Blockchain offered decentralized and freelance platforms to the workers through escrow systems and secure payments. From credential verification to employee benefits, this technology is playing a vital role in implementing secure work environments. Citizens can benefit from, this Blockchain technology in a variety of ways such as a secure voting system and governance, transparent land and property record management, access to decentralized financial systems, and data privacy and control.

AI and ML are rapidly emerging fields that took the Computer Science fields by storm and impacted every corner of its development. As I am more interested in financial applications, I can benefit from AI and ML for decision-making applications that can analyze the existing data, and find insightful patterns to be used in making decisions and predictions for financial strategic decision-making. This data and information can be used to visualize the data and present logical graphs and summaries to assist in understanding the present corporate position and future strategies. Blockchain technology can help me develop decentralized applications such as DeFi platforms to develop secure and decentralized financial

applications. The Computer Science Capstone helps me research and learn about these new trends that can significantly help me improve my ePortfolio and adopt new trends and technologies to update my skillset and prepare myself for the compatibility of the current Industry and Computer Science development marketplace. The major learning outcome of this course is how to enhance an already existing project or an artifact by adopting the best Software Design and Development techniques and procedures.

Checkpoint	Software Design and Engineering	Algorithm and Data Structures	Databases
Name of Artifact	Contact Service Unit Testing	Vector Sorting using Quick Sort	MongoDB Database on Animal Shelter
Status of Initial Enhancement	Completed enhancement and submitted during module 2	Completed enhancement and submitted during module 2	Completed enhancement and submitted during module 2
Submission of Status	Completed	Completed	Completed
Status of Final Enhancement	Completed and submitted in Module 3 Milestone 1 enhancement	Completed and submitted in Module 4 Milestone 2 enhancement	Completed and submitted in Module 5 Milestone 3 enhancement
Uploaded to ePortfolio			
Status of Finalized ePortfolio			