Evelyn Castro

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**Artificial Intelligence and Machine Learning**

Revolutionizing the manner in which computers process data and make decisions. These technologies are significantly enhancing decision-making processes within businesses and automating routine tasks, thereby influencing a wide array of industries. The capability to analyze extensive datasets, identify patterns, and predict outcomes without human intervention is immensely powerful and transformative.

AI and ML are leading to the development of smarter algorithms, better data analytics, and autonomous systems. In terms of computer science, this means more focus on neural networks, deep learning, and AI ethics. The research into improving computational efficiency, developing more sophisticated algorithms, and solving complex problems like natural language processing is growing rapidly.

Holding significant promise for enhancing consumer products through increased personalization, particularly in industries such as e-commerce and healthcare. Automation can handle repetitive tasks for employees. This lets them concentrate on more complex and creative work.As citizens, we can benefit from enhanced public services, more intelligent urban management, and improved health monitoring.

Given my interest in AI and its integration with virtual reality and 3D modeling, it will play a key role in making virtual worlds more interactive and responsive. Machine learning algorithms will likely improve object recognition and interaction in VR settings.

I have worked on machine learning concepts indirectly through Python and data-driven applications in my MongoDB and Dash project. I have learned how to apply algorithms, understand data structures, and design for performance, all of which align with AI/ML principles. However, I still need to deepen my knowledge of algorithms specific to AI, such as neural networks and reinforcement learning.

**Quantum Computing**

Quantum computing is changing how we think about computers. It uses the principles of quantum mechanics to process information in ways that regular computers cannot.Quantum computers may solve problems that classical methods cannot handle, especially in fields like cryptography, drug discovery, and materials science.

Quantum computing challenges current algorithms and opens new areas for research. Computer scientists will need to rethink how they design algorithms, create stronger encryption methods, and find practical uses for quantum computing. This will also lead to new programming languages and tools for quantum computers.

The immediate effects will be felt in industries like cybersecurity and pharmaceuticals. In the future, consumers might enjoy more secure online transactions, and workers in science and technology will see faster advancements in problem-solving. We could also witness breakthroughs in medicine and environmental sustainability.

As someone interested in new technologies, I find quantum computing exciting. It connects to my interest in advanced computing techniques and 3D rendering because it could allow for faster simulations of complex systems, such as realistic physical environments.

My work with algorithms, data structures, and problem-solving techniques, especially with MongoDB, lays the groundwork for understanding how quantum computing can tackle complex problems efficiently. However, I still need to learn about quantum algorithms and programming languages like Qiskit, which will be my next step.

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| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | Android Authentication App | User Authentication System | SQLite User Management |
| **Status of Initial Enhancement** | The initial version of the app was successfully developed, with user login and basic inventory management features implemented. | The initial version included a basic user authentication system using SQLite to store and verify user credentials. | Enhanced CRUD operations and visualization features. |
| **Submission Status** | Submitted for initial review. | Submitted for initial review. | Submitted for initial review. |
| **Status of Final Enhancement** | Final enhancements included refining the user interface, improving error handling, and adding session management features for a smoother user experience. | The final enhancements involved hashing passwords using SHA-256 for increased security and refining the login logic for better performance. | Final improvements included optimizing database queries for performance and implementing data validation to ensure correct data input. |
| **Uploaded to ePortfolio** | In progress | In progress | In progress |
| **Status of Finalized ePortfolio** | Awaiting final edits before submission. | Awaiting final edits before submission. | Awaiting final edits before submission. |