6-1 Journal: Emerging Technology and Artifact Update

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SNHU CS-499

Part One:

For this journal entry I have selected quantum computing and graphene-based resistors.

1. What is the identification and description of each technology?

Quantum computing is an emerging technology that uses multiple qubit states to solve problems as opposed to the binary off-on state used by classical computers. Graphene-based transistors are semiconductors that use graphene instead of traditional silicon to move electrons around within a processor.

2. What are the likely impacts on computer science or your career?

Given the ever increasing complexity of modern applications, it seems that we will inevitably move towards a more complex computing technology such as quantum computing that could expand the possible solutions to certain problems. At the same time, as the demand for more complex solutions increases so will the demand for more complex hardware. It is often said that Moore's law – the observation that says the number of transistors in an integrated circuit doubles every two years – is dead and that modern semiconductors are reaching their limit. Graphene-based transistors may provide a solution.

3. How might the two technologies impact humans, communities, or the world?

There are positives and negatives to both technologies. Combined, the advanced hardware possible with graphene-based transistors combined with the advanced complexity of quantum computing could solve many modern problems and automate many modern tasks to make lives easier for people. However, without proper regulation, the impact on indivuals whose jobs are replaced by automation or on communities whose environment is poisoned by graphene production might be severe.

4. Which course outcomes have you achieved so far, and which ones remain?

I feel I have achieved most if not all of the course outcomes listed in the final project rubric.

- *Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science*

I feel I have accomplished this both through my code review video and through the communication needed to clarify how best to demonstrate my code enhancements.

- *Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts*

I feel I have accomplished this with my code review video as well as my enhancement demonstration videos and documentation.

- *Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution, while managing the trade-offs involved in design choices*

I believe I have accomplished this with the complexity of the enhancements I have implemented – the simulation of a drone that catalogs and tracks random objects in an anvironment.

- *Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals*

I believe I have accomplished this with the utility of my enhancements – the classification of random object by a simulated drone and the data visualization of objects.

- *Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources*

I believe I have accomplished this by applying all my enhancements to a single project and designing it as a self-contained system that does not interact with any outside systems.

Part Two:

Provide an update to your instructor on your progress with each category of artifacts for the ePortfolio:

- Software design and engineering

Enhancements have been implemented and object parameters are user-adjustable.

- Algorithms and data structures

Enhancements have been implemented and drone movement adjusts based on object variables.

- Databases

Enhancements have been implemented. Dataset is created and is used for data visualization.

Status Checkpoint for All Categories

Checkpoint	Software Design and Engineering	Algorithms and Data Structures	Databases
Name of Artifact Used	**Artifact Name:** Interactive 3D Scene **Origin:** CS 330 Computer Graphics and Visualization	**Artifact Name:** Interactive 3D Scene **Origin:** CS 330 Computer Graphics and Visualization	**Artifact Name:** Interactive 3D Scene **Origin:** CS 330 Computer Graphics and Visualization
Status of Initial Enhancement	Enhancements completed	Enhancements completed	Enhancements completed
Submission Status	Resubmitted	Submitted	Submitted
Status of Final Enhancement	Completed	Completed	Completed
Uploaded to ePortfolio	Pending	Pending	Pending
Status of Finalized ePortfolio	Pending	Pending	Pending

References

A. P. Singh, P. N. Shankar, R. Baghel and S. Tirkey, "A Review on Graphene Transistors," 2023 IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS), Bhopal, India, 2023, pp. 1-6, doi: 10.1109/SCEECS57921.2023.10062965.

Fitter, D. W. F. (n.d.). *6 Surprising innovations for the future of Computing*. SAP Insights. https://www.sap.com/blogs/6-surprising-innovations-for-the-future-of-computing

The Death of Moore's Law: What it means and what might fill the gap going forward | CSAIL Alliances. (n.d.). CSAIL Alliances. https://cap.csail.mit.edu/death-moores-law-what-it-means-and-what-might-fill-gap-going-forward