Danielle Sousa

CS-499: Computer Science Capstone

4/8/2025

Professor Kraya

**6-1 Journal: Emerging Technology and Artifact update**

1. **What is the identification and description of each technology?**
   1. Bioprinting- This technology uses 3D printing to create organs and tissues in the medical field.
   2. Blockchain technology- is a separated digital ledger that records transactions across many other computers that ensures security, transparency and consistency of the data.
2. **What are the likely impacts on computer science or your career?**

**Bioprinting:**

***Computer Science -*** The likely impacts on computer science area are it will require very advanced computer models to produce the behaviors of the biological materials and to predict the outcomes. This will also require algorithms to be created for tissue growth. Vascularization and cellular interactions. (Listek, V. (2024, September 19).

***Career Impacts-*** In areas such as Biomedical engineering, Research and Development and Healthcare and Medicine, Professionals in this area will need to collaborate in order to design and improve bioprinting technologies which could include developing new Bioinks and enhancing printing techniques, as well as improve precision and functionality of the printed organs or tissues. Medical professionals will need to report to computer scientists to integrate bioprinting into clinical trials. (3D printing in healthcare. (2024).

**Blockchain Technology:**

***Computer Science –*** The likely impacts oncomputer science area are in Security and cryptography, Distributed Systems and Data Structures and Algorithms. Blockchains rely on cryptography to ensure data integrity and security. This has advanced the algorithms and protocols that have tested what is possible in regards to secure communications. Data is stored across multiple nodes which has transpired research and development in distributed computing. This has also inspired thinking of new ways to store data and retrieve it, such as in the use of hash functions, Merkle trees and other data structures.

***Career Impacts-***There is a demand for developer that are knowledgeable in blockchain technologies. Because of the development of blockchain technologies the need for cyber security professional have increased. To prevent the networks from attacks. Because, blockchain generates a large amount of data that needs to be analyzed there is a need for data science Analytic professionals that can interpret the data that can help organizations optimize the operations and develop predicative models. Lastly, the need for professional that can understand the legal and regulatory implications that are involved.

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

The two technologies impact humans, communities and the world by:

***Bioprinting -*** Improving healthcare and how medical professional deal with treating their patients. This can reduce the waiting time for someone who needs to receive a life saving transplant. This can deliver personalized medicine to patients and can accelerate the development of new drugs and reduce its cost. (‌ Yaneva, A., Shopova, D., Bakova, D., Mihaylova, A., Kasnakova, P., Hristozova, M., & Semerdjieva, M. (2023).

***Blockchain Technology –*** can provide financial services to banking populations that enable secure but low-cost transactions without the need for traditional banking. It can help economic growth. The blockchains transparency promotes trust especially in system such as voter systems and public records. This can reduce fraud, corruption and inefficiencies. (Young Entrepreneur Council. (2018, March 26).

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

I have achieved all 5 course outcomes. No further outcomes remain, however it could be improved and polished.

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| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | CS-360 Events Tracking  App | CS-360 Events Tracking  App | CS-360 Events Tracking App |
| **Status of Initial Enhancement** | Enhancement one is has been completed on 3/23/25 | Enhancement Two is completed on 3/30/25 | Enhancement is Completed on 4/6/2025 |
| **Submission Status** | Has been submitted to Received instructors Feedback | Has Been submitted  Received instructor feedback | Has been submitted awaiting instructor feedback |
| **Status of Final Enhancement** | Planned not yet completed | Planned not yet completed | Planned not yet completed |
| **Uploaded to ePortfolio** | Completed | Completed | Completed |
| **Status of Finalized ePortfolio** | Planned not yet completed | Planned not yet completed | Planned not yet completed. |

**References**

Listek, V. (2024, September 19). *The Bioprinting Frontier: What’s Next in the Industry? - 3DPrint.com | The Voice of 3D Printing / Additive Manufacturing*. 3DPrint.com | the Voice of 3D Printing / Additive Manufacturing. https://3dprint.com/312523/the-bioprinting-frontier-whats-next-in-the-industry/

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Topic: 3D printing in healthcare. (2024). *Statista*. <https://doi.org/1010181/published-3d-printing-patents-in-the-us-by-company>

‌ Yaneva, A., Shopova, D., Bakova, D., Mihaylova, A., Kasnakova, P., Hristozova, M., & Semerdjieva, M. (2023). The Progress in Bioprinting and Its Potential Impact on Health-Related Quality of Life. *Bioengineering*, *10*(8), 910. https://doi.org/10.3390/bioengineering10080910

Young Entrepreneur Council. (2018, March 26). Eight Ways Blockchain Will Impact The World Beyond Cryptocurrency. *Forbes*. https://www.forbes.com/sites/theyec/2018/03/09/eight-ways-blockchain-will-impact-the-world-beyond-cryptocurrency/

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