**CS-499 5-1 Journal**

In exploring the latest trends in computer science as of 2024, two particularly interesting developments stood out among the masses: Edge Computing and Zero Trust Security Models. Both of these trends are poised to significantly influence the field of computer science, impacting not just the technical landscape but also the experience of consumers, workers, and citizens, and offering intriguing career opportunities for individuals aligned with these areas.

1. **What is the significance of each trend?**

Edge computing addresses the limitations of traditional cloud computing by processing data closer to its source, thereby reducing latency and enhancing real-time data processing capabilities. This technology is especially crucial for applications requiring quick decision-making, like IoT, autonomous vehicles, and healthcare systems, making it a significant advancement in computer science (Intellipaat, 2023).

“’Zero Trust’ searches have increased by 642%. General awareness of this security concept started to take off in 2019” (Howarth, 2023). The Zero Trust model represents a fundamental shift in information security, moving away from traditional perimeter-based defenses to a model where trust is never assumed, regardless of whether access requests come from inside or outside the network. This approach is increasingly relevant in an era of sophisticated cyber threats and high-profile data breaches​ (Howarth, 2023).

1. **How will each trend change the field of computer science?**

By decentralizing data processing, edge computing shifts the paradigm from centralized cloud storage to distributed processing, encouraging advancements in networking, data security, and real-time analytics. This shift is anticipated to foster new research and development in localized data processing technologies and protocols (Intellipaat, 2023).

Adopting Zero Trust necessitates a rethinking of network architectures, authentication mechanisms, and access controls. It encourages the development of more sophisticated security technologies that can dynamically authenticate and authorize access, leading to innovations in cybersecurity practices and solutions (*Zero trust security | what is a Zero trust network? | cloudflare*).

1. **How will each trend change the experience of consumers, workers, or citizens?**

For consumers and businesses, the move to edge computing means faster and more reliable services, particularly in applications like streaming, gaming, and online services that require high bandwidth and low latency. In industries such as healthcare, it could lead to more immediate data analysis, improving patient care through real-time monitoring and decision-making (Intellipaat, 2023).

For organizations, Zero Trust models enhance security by minimizing the risk of internal and external breaches. Consumers and citizens benefit indirectly through the increased protection of their data held by these organizations, leading to a reduction in identity theft, fraud, and other cybercrimes​ (*Zero trust security | what is a Zero trust network? | cloudflare*)

1. **How will each trend fit in with your career interests or aspirations?**

Both of these trends have significant impacts and implications on my future career plans and aspirations. The Navy is just now moving to cloud computing solutions for some of our systems, so the very idea that there is something out there, like edge computing, that is already working to mitigate the limitations of a system that we haven’t fully adopted yet is equal parts mind-blowing and fascinating. Zero Trust isn’t a new concept, but the growing influence and adaptation of it demands that I acquire a familiarity, if not an all out proficiency, in it’s policy if I hope to deal with computers at all in my next career.

These are just two of a wide array of growing trends, the totality of which was rather humbling to sift through. Having not yet decided on what my “next life” looks like, this search into emerging trends clearly underscored the fundamental need to stay plugged in to the world of computer science, or I will get left behind by it before I’m aware it has happened.

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

As of this journal, I have satisfied, at least to some degree, all of the course outcomes. Incorporating the SQL database to my artifact was the final piece to the puzzle. That’s not to say it is all perfect, but it’s initial enhancement is complete. The one remaining element is uploading all the documents and artifacts to GitHub, after incorporating feedback from my professor. It has just now occurred to me that this represents the whole of my academic experience. It is surreal. I started my journey, and my appreciation for coding August of 2001, in Dr. Bonita’s Intro to Computer Science where I first learned C++. Now, just shy of 23 years later, I am on the precipice of closing that book. I don’t mean to say that I’ve completed it; however, the work that remains is a polishing, smoothing effort. No new creation stands between myself and my degree. It’s an incredible feeling.

**Status Checkpoints for All Categories**

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| --- | --- | --- | --- |
| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| *Name of Artifact Used* | IT-145 Final Project | IT-145 Final Project | IT-145 Final Project |
| *Status of Initial Enhancement* | Complete | Complete | Complete |
| *Status of Final Enhancement* | In Progress | In Progress | In Progress |
| *Uploaded to ePortfolio* | Incomplete | Incomplete | Incomplete |
| *Status of Finalized ePortfolio* | Incomplete | Incomplete | Incomplete |

***References:***

Howarth, J. (2023, December 11). *7 important computer science trends 2024-2027*. Exploding Topics. https://explodingtopics.com/blog/computer-science-trends

Intellipaat. (2023, October 19). *What is edge computing? application & examples*. https://intellipaat.com/blog/edge-computing/

*Zero trust security | what is a Zero trust network? | cloudflare*. CLOUDFLARE. (n.d.). https://www.cloudflare.com/learning/security/glossary/what-is-zero-trust/