Class: CS499 Computer Science Capstone

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**Trend 1: Artificial Intelligence – learning intelligence utilized to automate tasks and make decisions and predictions based on identified patterns.**

**Trend 2: Internet of Things – connecting devices and systems to enhance every day life.**

**Part 1:**

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

Artificial intelligence is significantly impacting our society in many ways. It is improving the way we utilize data and analytics to make important decisions that were previously vulnerable to human bias or error. Artificial intelligence is significantly improving our every day lives through tools like chat bots, voice assistants, task automation, writing assistance, and help with critical decision making. Internet of Things is significantly changing the way we connect physical and digital systems, allowing every day objects to communicate and interact. This connects physical devices to the internet where tasks can be automated and controlled remotely, and data is analyzed to gain valuable insights into customer behavior and operations. A great example of this is thermostats. We can cut costs and eliminate wasteful consumption by automating the timing and temperature control of heating and cooling systems. Sensors can help monitor the device performance and detect potential issues before they cause major breakdowns – essentially ensuring customers are not left without cooling during the height of summer, and not left without heating during frigid winter temperatures.

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

Artificial Intelligence is enabling systems to collect and analyze data, and then perform tasks based on programmed algorithms for appropriate responses to that data. This is extremely efficient, as no human interaction is needed beyond the initial programming of the responses for repetitive tasks. This is a powerful tool for data analysis, machine learning provides the opportunity to analyze larger datasets and identify patterns not easily replicated by humans. From a safety standpoint, artificial intelligence can protect data through applications such as facial recognition and image analysis. Internet of Things is enabling us to receive real time data from connected devices, this changes the way we collect, analyze, and make decisions about data. These new and diverse devices change the way we store, process, and analyze big data. With embedded systems there is a need to focus design options for low power and communication capabilities to integrate the system.

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

With these emerging trends, there are benefits and drawbacks to consumers, workers and citizens. Artificial Intelligence and Internet of Things raise important ethical considerations regarding privacy and employment concerns. Tasks that can be programmed and completed more efficiently by a machine, could potentially replace the need to hire human employees. Utilizing Artificial Intelligence to interact with customers to answer their questions, or provide advice is certainly more cost effective than hiring a human to handle customer inquiries, but what does this mean for our society? What other employment options will these displaced employees have? Also, some consumers may prefer to talk to a human over a bot, how do we account for this? While we certainly can’t please everyone, it is important to consider where it is preferable and advisable to utilize these technologies, and where we should continue to utilize human employees. For example, when dealing with life and death situations such as a 911 call operator, I believe it is important to continue utilizing humans for important decision making and quick response actions. When dealing with enhancements such as answering commonly asked questions and making simple suggestions to assist customers with decisions for ordering a car that fits their needs, artificial intelligence is an ideal option.

Artificial Intelligence and Internet of Things also provide important benefits to consumers, workers, and citizens. Self driving cars are providing us with improved safety, educational programs are improving with personalized tutoring and learning platforms, and healthcare is improving with better personalized treatment plans.

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

My career aspirations are to continue working within the Insurance Industry. These trends are raising some exciting opportunities for developers. Like most organizations, insurance companies utilize artificial intelligence for chat bots to communicate with customers. Looking specifically at Progressive Insurance, they have developed a tool called Snapshot that falls under the category of Internet of Things. They provide their customers with a plug in device to collect data on their individual driving habits such as driving time of day, speed, and braking and this information is utilized to develop personalized rates. This is a great example of the potential enhancements we can make to improve insurance programs and services to benefit society. With my knowledge and experience in Computer Science I feel better prepared to participate in projects, or research and development of additional IoT features for insurance products and services.

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

To date, I have achieved the course outcome for Software Design and Engineering, Algorithms and Data Structures, and Databases.

**Part 2:**

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

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| --- | --- | --- | --- |
| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | Artifact: CRUD Java class  Origin: CS 340 Animal Shelter Python class | Artifact: Project Two Dashboard  Origin: CS 340 Dashboard | Artifact: Revised Dashboard With Authentication CS340  Origin: CS 340 MongoDB user login |
| **Status of Initial Enhancement** | Enhancements completed | Enhancements completed | Enhancements completed |
| **Submission Status** | Submitted with feedback from the instructor | Submitted with feedback from the instructor | Submitted to instructor for feedback |
| **Status of Final Enhancement** | Feedback was applied, and the final polish was applied | Feedback was applied, and the final polish was applied | Awaiting feedback from instructor |
| **Uploaded to ePortfolio** | In progress | In progress | In progress |
| **Status of Finalized ePortfolio** | In progress | In progress | In progress |