Class: CS499 Computer Science Capstone

Professor: Ramsey Kraya, PhD

Student: Anna Fisher

Date: 2/14/2025

**Part 1:**

**What is the identification and description of each technology?**

A disruptive technology I will discuss first is 3D printing. In the past, printing technology was primarily creating flat images on paper. The quality of 2D printing was limited, the ability to see intricate details is difficult, if not impossible. Today, 3D printing creates a physical object from the digital design. This is a manufacturing process by which material such as plastic, metal, ceramics, or resin is layered to build complex shapes with intricate detail. The layers are fused together through light, heat, or a chemical reaction.

An example of a game changing technology in computer science, is virtual reality. Virtual reality is a system generated environment this is utilized to immerse the user within an interactive environment. There are various types of Virtual Reality, there is non-immersive, semi-immersive, fully immersive. The user wears a headset to block out the real world view and display a virtual world or video instead. The headset includes head and body tracking systems for real time determination of the users movements and position within the virtual world. There are also systems that provide auditory feedback to the users, to enhance the virtual experience.

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

As many new sectors of our society have begun to see and use the benefits of 3D printing, this is making an impact on computer science. Software developers will need to be trained or educated on software design for 3D printing products. This will add additional options in the field of computer science for new developers, or developers looking for a change. As 3D printers are being introduced more and more, it’s very possible that software developers will be asked to work with other teams to support or improve 3D printing technology within their business sector. This will require additional education.

With all the benefits of Virtual Reality on various sectors of our society, there is an impact to computer science. We need innovative developers that can design and build complex interactive system components, sensor technology, and graphics rendering. As cloud based Virtual Reality becomes more prevalent, developers will need to be trained on how to create systems hosted in the cloud, versus directly within the user’s high-end hardware. As artificial intelligence continues to grow, developers will need to be aware and educated on how to integrate artificial intelligence within a system like Virtual Reality.

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

There are many applications of 3D printing that are radically improving many sectors of our society. Aerospace utilizes 3D printing for complex components of aircraft, the automotive industry is utilizing 3D printing for custom parts and tools, and even jewelry and toys can be created. In orthodontics, a 3D printer is utilized to create highly customized appliances like retainers and brackets. A scan is taken of the patient’s teeth which is utilized by the 3D printer to generate a model of the patient’s teeth, and the resulting appliance fits the patient’s teeth perfectly. This provides comfort for the patient, and treatment accuracy for the orthodontist.

Gaming is probably the most widely known, or recognized application of Virtual Reality technology as this has changed video games significantly. However, there are other sectors utilizing virtual reality in many important ways. In Education, classrooms are utilizing Virtual Reality to enable students to explore different learning styles. Instead of just reading about animals or plants in a book, they can utilize Virtual Reality to discover and interact with plants and animals in a much more interesting way that can lead to lasting impacts on personal understanding and growth. In the Medical field, medical staff can practice difficult or complex procedures within a virtual environment. This leads to better training and education, and overall results for patients.

**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:**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 | Planned but not yet completed |
| **Uploaded to ePortfolio** | Planned but not yet completed | Planned but not yet completed | Planned but not yet completed |
| **Status of Finalized ePortfolio** | Ready for review in Module 7 | Ready for review in Module 7 | Ready for review in Module 7 |