Mark Ellis

Software Engineer

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Skills

C#, Python, C/C++, Unity 3D, Unreal Engine 5, Git, GitHub, Doxygen, Figma, Linux, Blender 3D, Haptics, Research, Simulations, Virtual Reality, Prototyping, gRPC, Visual Studio, HTML, CSS, JS

Experience

Software Engineer (Research Scientist) • Florida Polytechnic University

February 2023 - PRESENT, Lakeland, FL

- Collaborated with a team of 5 engineers and surgeons to develop metrics for user performance and evaluation, while also gathering feedback to enhance software and hardware interfaces.
- Leveraged C# and Unity 3D to create 5 intricate, fully simulated environments designed for open surgery training, incorporating haptic feedback hardware, VR, and automated user evaluation.
- Developed innovative solutions to complex software issues through rapid prototyping, consistently delivering prototypes on a weekly basis and completing simulations within 4 months.
- Created Python scripts to analyze metric data obtained from user studies, generating tables and graphs for fundamental data analysis and assessing data validity.
- Co-authored 4 research papers on virtual reality COSATS surgical simulations, conducted research on related projects, developed a comprehensive methodology for simulated systems, and analyzed the results.

Software Engineer • Avra Medical Robotics

January 2022 - September 2022, Orlando, FL

- Co-architected a patent-pending medical robotic system by translating clinical and regulatory requirements into a functional prototype, with IP valued at approx. $1M.
- Developed a comprehensive treatment plan software from initial concept to prototype, comprising 8k lines of code written in C#, Python, and Unity, successfully meeting deadlines 2 months ahead of schedule.
- Optimized algorithms, increasing performance by more than 100% for 2D to 3D conversion processes and 3D scan processing, reducing application bottlenecks.
- Worked collaboratively with a team of 3 engineers to develop a communication system for controlling and monitoring the robotic system using gRPC.
- Presented the prototype and captured the interest of prominent investors, including Dr. Frederic Moll, the founder of Intuitive Surgical, Estée Lauder, and Miraki Innovation, a venture capital firm, to support executives in securing funding.

Research Assistant in Computer Science • Florida Polytechnic University

May 2020 - April 2021, Lakeland, FL

- Led a team of 4 to create an immersive environment in Unreal Engine, integrating a simulated vehicle developed in Simulink and Python.
- Designed and implemented a simulated environment to test the ability of provided AV algorithms in a safe and repeatable method.
- Refined a provided Unreal Engine environment, increasing performance by 200%, allowing the simulation to be more accurate and effectively analyzed.

Education

Florida Polytechnic University / Computer Science

August 2018 - May 2022, Lakeland, FL

Summa Cum Laude (GPA: 3.98)
Presidents List: 2018-2022