

# Raymond Lawrence

SOFTWARE ENGINEER

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## Education

### University of Louisville

BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND ENGINEERING

Minor in Mathematics

Louisville, KY

August 2023

## Skills

**Programming** C/C++ (5 years, 3 public projects), GLSL (6 months, 1 project), Python (4 years), C# (2 years, 1 project)

**Graphics** Unreal Engine (1 year, 1 project), Unity Engine (2 years, 1 projects), OpenGL (6 months, 1 project)

**Tools** Git, Visual Studio, GDB, RenderDoc

**Other** Linux, Linear Algebra, Multivariable Calculus, Technical Writing

## Applied Experience

### Manufacturing Digital Twin

PUBLICATION: [HTTPS://IISE.CONFEX.COM/IISE/2023/MEETINGAPP.CGI/PAPER/2685](https://iise.confex.com/iise/2023/meetingapp.cgi/paper/2685)

REPOSITORY: [HTTPS://GITHUB.COM/RLWRNC/DIGITALTWIN](https://github.com/rlwrnc/digitaltwin)

- VR-based digital twin of a manufacturing system consisting of 3D printers and UR3 robots
- Model built in **Unreal Engine 4** with custom components written in **C++**
- Architected custom data-collection infrastructure using Arduino microcontrollers and Raspberry Pi processors
- Communicated data over a LAN via hand-written UDP and TCP components written in **C**, as well as a pre-existing REST API

### Trager Microforest at Founder's Square

REPOSITORY: [HTTPS://GITHUB.COM/RLWRNC/MICROFOREST](https://github.com/rlwrnc/microforest)

- VR-based interactive model of a design of a local park
- Built in the **Unity Engine** with custom components written in **C#**
- Integrated **OpenXR**-based eye tracking to gauge user interest on various park elements
- Interdisciplinary project with the UofL Urban Design Studio

### The POSIX Projects

REPOSITORY: [HTTPS://GITHUB.COM/RLWRNC/THE-POSIX-PROJECTS](https://github.com/rlwrnc/the-posix-projects)

- A variety of command-line utility applications written for a course in Operating Systems
- Written in **C** using standard POSIX libraries
- Includes a multi-threaded directory tracer, a client-server search application, and a ex2 partition analyzer

## Work Experience

### Aqlan Lab @ UofL

UNDERGRADUATE RESEARCH ASSISTANT

Louisville, KY

Jan. 2022 - Aug. 2023

- Architected a VR-based interactive model of a downtown Louisville park.
- Built a digital twin of a simple part assembly system in **Unreal Engine**.
- Helped develop virtual reality systems in the **Unity** game engine, including a multi-player collaborative factory.

### U.S. Army Human Resources Command

COMPUTER ENGINEERING TRAINEE

Ft. Knox, KY

Jan. - May. 2021, Aug. - Dec. 2021

- Constructed data visualization dashboards using the Oracle Business Intelligence software suite.
- Participated in weekly team meetings to discuss and set project goals.

### Engineering Fundamentals Department @ UofL

UNDERGRADUATE RESEARCH ASSISTANT

Louisville, KY

May - Jul. 2021

- Wrangled data related to student performance using the NumPy and Pandas **Python** libraries.

## Activites + Honors

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### **Executive Vice President, Triangle Fraternity**

- Regularly communicated with sub-officers to ensure they met their goals.
- Helped organize weekly chapter meetings.

### **Eagle Scout**

- Lead construction and installation of a community food pantry at a local church.
- Staffed two National Youth Leadership Training (NYLT) events.