# JOHN MURRAY

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## EDUCATION:

**University of Massachusetts Amherst,** Amherst, MA
**Ph.D. in Computer Engineering**
Expected May 2028
GPA: 3.56/4.0

**University of Massachusetts Amherst,** Amherst, MA
**Master of Science in Computer Engineering**
May 2024
GPA: 3.63/4.0

**University of Massachusetts Amherst**, Amherst, MA
**Bachelor of Science in Computer Engineering**
May 2021
GPA: 3.55/4.0

## RELEVANT COURSEWORK:

- Computer Networks
- Probability & Random Processes
- Game Programming
- Computer Architecture
- Trustworthy Computing
- Machine Learning for Engineers
- Algorithms for Computer Engineering
- System Software & Networking 1 & 2

## RESEARCH EXPERIENCE:

**Research Assistant, University of Massachusetts Amherst** May 2019 - Present

- Working under Professor Michael Zink on projects involving 360 video DASH streaming and augmented reality conferencing.
- Developed applications utilized for virtual reality research for PC-VR based systems and mobile phones, as well as augmented reality applications for the Hololens 2.
- Developing a Nginx based caching server integrating a video super-resolution module.

**Graduate Intern, Center for Human Health and Performance (University of Massachusetts Amherst)** May 2022 - Present

- Advised on selection of hardware for research on the effects of head mounted weight on a soldier's ability to react to stimulus.
- Gained experience in Unity and Unreal Engine 5 development of VR applications using the OpenXR SDK.
- Learned the process for setup for Varjo enterprise XR-3 & XR-4 headsets, and the use of a Qualisys motion capture system.

## PUBLICATIONS:

**Video 360 Content Navigation for Mobile HMD Devices**
*Jounsup Park, John Murray, et. al. 2020. Video 360 Content Navigation for Mobile HMD Devices. In Proceedings of the 28th ACM International Conference on Multimedia. Association for Computing Machinery, New York, NY, USA, 4497–4499. DOI:https://doi.org/10.1145/3394171.3414389*

**L3BOU: Low Latency, Low Bandwidth, Optimized Super-Resolution Backhaul for 360-Degree Video Streaming**
*A. Sarkar, J. Murray, et. al. , "L3BOU: Low Latency, Low Bandwidth, Optimized Super-Resolution Backhaul for 360-Degree Video Streaming," 2021 IEEE International Symposium on Multimedia (ISM), 2021, pp. 138-147, doi: 10.1109/ISM52913.2021.00031. DOI: https://doi.org/10.1109/ISM52913.2021.00031*

## WORK EXPERIENCE:

**Hardware Technician, Valid8.com, Wakefield, MA** Dec 2016 - Sept 2018

- Participated on a team of 5 developers in fast moving environment.
- Collaborated with engineering team to develop, build, test, and document telecommunications protocol & transmission testing hardware and software.
- Provided onsite customer support for companies in and outside of the United States.
- Experienced with Dell & Supermicro servers as well as general server room management.

## LEADERSHIP EXPERIENCE:

**Equipment Staff Co-Manager, UMass Minuteman Marching Band** 2020

- Helped distribute and keep record of instruments as well as assist in resource management for 5 other staff members.
- Created the first handbook that covers instrument repair, sound system setup and usage, general event description, and staff requirements at events.

**Event Assistant, Multimedia Systems Conference, UMass Amherst** 2019

- Assisted through general technical support, setting up daily activities, guiding conference members around campus, and registration of arriving members.

**Summer Program Guest Speaker, UMass Amherst** 2019, 2022

- Created and presented a demonstration for summer program students on *How Virtual Reality Headsets Function*.
- The presentation offered a Q & A session and an opportunity for the students to try a virtual reality headset and a sample Unity application made for the Hololens 2 headset.

## PROJECTS:

**Wrist Mounted Hypoglycemia Alert Wristband (Name – ShiverRing)**

Using an M4 based microcontroller, accelerometer, and BLE module this device was able to sense hand tremor frequencies the same as those occurring in patients suffering from severe hypoglycemia. A phone is then used to alert nearby family members / emergency services.

**Dual Tone Audio Device Using PWM Capabilities of the Atmel 328p**

Utilized a breadboard mounted Atmel 328p with supporting components in combination with a basic voltage adder op-amp circuit to create a dual tone sound through headphones using only PWM signals.

**Unity & Unreal AR/VR App development**

Created 5 apps with more in progress for the Microsoft HoloLens 2 AR headset, including one that works with the research mode of the headset, allowing for direct data read from the onboard IMU and depth camera data, and more VR apps utilizing the OpenXR SDK for compatibility for a wide range of VR headsets

**Google Forms Spreadsheet Automation**

Automated a reporting process used for the research position at UMass Amherst. Using Google Scripts, coded changes to allow any spreadsheet to be easily moved, deleted, or have basic changes applied even when linked to separate Google Forms.

## OTHER ACHIEVEMENTS:

Invited to & participated in Cyber Defense Competition at Argonne National Labs 2016
Performed Tenor Sax in Disneyland New Year Parade and Rose Bowl 2017/2018