RYAN CHEN

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EDUCATION

Duke University **August 2021 - May 2025**
Bachelor's, Computer Science *GPA: 3.94*
- Algorithms, Digital Systems, Computer Graphics, Computer Game Design, Machine Learning

Duke University **August 2021 - May 2025**
Bachelor's, Electrical Engineering *GPA: 3.5*
- Sensor & Sensor Interface Design, Deep Learning, Image & Video Processing, Natural Language Processing

PROFESSIONAL EXPERIENCE

I^3T Lab **Durham, NC, USA**
Apple Vision Pro Developer *May 2024 - Present*
- Develop diminished reality (object removal, inpainting) techniques on Apple Vision Pro using Swift and RealityKit
- Optimize performance for Apple M2 chip via Metal compute pipeline and low-level optimizations
- Utilize training time compression on LaMa deep-inpainting and EdgeSAM models for lightweight use on Vision Pro (SwiftUI, C#, C++, Python)
- Devise vertex algorithm to obtain localized mesh geometry for performance boost, thus improving memory usage by over 60%
- Planned paper submission to ISMAR 2025.

Intelligent Interactive Internet of Things Lab **Durham, NC, USA**
AR Application Developer *September 2023 - Present*
- Spring 2024: Expand the Segment Anything model into AR space through multimodal audiovisual input. Optimization of the ML pipeline for higher quality and fidelity (Python, C#, PyTorch, Unity). Implement TCP/IP edge server for ML analysis between HoloLens 2 and Python backend using concurrency.
- Development of an AR application in Unity3D using C# to provide therapeutic responses for patients with misophonia.
- Utilize MRTK3 and Microsoft Hololens APIs to program comprehensive app for user study in conjunction with Duke Psychology and Duke Health.
- 2nd Place winner of ECE Independent Study Award at Duke.

Align Technology **Raleigh, NC, USA**
Software Quality Engineering Intern *May 2023 - Present*
- Development of DevOps Python scripts for wide-scale optimization of the software development pipeline (Arena, Bamboo, Jira Data Center, TM4J Zephyr Scale, Artifactory APIs)
- Reduced time spent on Jira project management by over 72%.
- Wrote and tested unit and integration tests to ensure quality of delivered product.

Big Ideas Lab **Durham, NC, USA**
Undergraduate Researcher *September 2022 - Present*
- Investigation of thermal perception, emotional stress levels, and manipulation with AR.
- Coding of signal analysis and processing algorithms (Python - MNE, Matlab - EEGlab)
- AR development in Unity with biomarker integration.
- Conference paper at IEEE VR 2023

PROJECTS & OUTSIDE EXPERIENCE

HCI Study on LMS *August 2024 - December 2024*
- Working with Dr. Pardis Emami-Naeini on an HCI study centered on understanding perceptions towards Learning Management Systems (LMS) across several campuses
- Qualitative coding analysis, user study design, and HCI research paper (in progress).

Metal Game Engine *May 2024 - Present*
- Development of 3D Metal game engine with ECS capabilities, currently able to perform multi-render passes (WIP).

2D Graphics Engine **Durham, NC, USA**

January 2024 - May 2024

- Development from start to finish of a 2D Graphics Engine based on Skia Graphics using C++
- Optimization of runtimes, analysis+refactoring of code, and design of graphics rendering pipeline to support geometric primitives, scan conversion, transformations, compositing, image sampling, tesselation
- Further support and refinement of library APIs for gradients, antialiasing, filtering, parametric bezier curves, and geometric stroking.

CS Sidekicks **Durham, NC, USA**

CS Mentor *September 2023 - December 2023*

- Empower and teach underserved Durham Public School students fundamentals of computer
- science through personalized mentorship, coursework, and encouragement.

Verilog RISC Processor *January 2023 - May 2023*

- Implemented a RISC processor using Verilog
- Demonstrate functionality via use of FPGA and VGA to play board games, such as Connect Four
- Modeled simpler version of processor in Logisim.

Simple Text-Difficulty Classification for Japanese *May 2023 - August 2023*

- Trained a supervised NLP model on the I-JAS dataset using Python and Spacy to classify text difficulty levels
- Use of k-folds cross validation and simple Spacy ML pipeline.
- *Link to project*

SKILLS

Skills: Data Analysis, Data Structures & Algorithms, JIRA, Git, Java, C/C++, Natural Language Processing (NLP), Python, Excel/Numbers/Sheets, Quality Assurance (QA), SpaCy, Unity, MATLAB, C#, Graphics Architecture, Augmented Reality, MRTK, Communication Skills, Machine Learning, Swift, REST APIs
Languages: German, Spanish, Japanese, Chinese
Interests: Computer Graphics, Vision, Game Design, Health and Technology, Signal Processing