# Zhongqian Duan

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## Education

**University of Michigan - Ann Arbor, MI** Aug. 2022 – Dec. 2023 (Expected)
- *M.S.E. in Computer Science and Engineering*
- Coursework: Advanced Compiler, Computer Networks, Parallel Computing, Natural Language Processing

**University of Michigan - Ann Arbor, MI** Aug. 2020 – May 2022
- *B.S.E. in Computer Science* | **GPA** 3.9 / 4.0 | **Honors**: Dean's List, University Honors, James B. Angell Scholar
- Coursework: Operating Systems, Database Management Systems, Machine Learning, Computer Vision, Deep Learning for CV, Computer Game Design, Computer Security, Parallel Programming with GPUs

**Shanghai Jiao Tong University** Sep. 2018 – Aug. 2022
- *B.S.E. in Electrical and Computer Engineering* | **GPA** 3.7 / 4.0 | **Honors**: Outstanding Student Scholarship

## Skills

**Programming Languages**: C/C++, C#, Python, Java, JavaScript, Kotlin, Matlab
**Frontend and Backend**: React.js, HTML, CSS, Node.js, MySQL, MongoDB, AWS
**Tools and Frameworks**: Git, LaTeX, CUDA, Pytorch, OpenCV, Scikit-learn, Mathematica, Unity, Jupyter Notebook

## Internship Experience

**Rec Room** Jan. 2023 – Apr. 2023 (Expected)
Incoming Software Engineer Intern Seattle, WA
- Embedded on the **tool development** team, where works across the client, server, editor and website.

**NIO** May 2021 – Aug. 2021
Machine Learning Engineering Intern Shanghai, China
- Optimized a **3D Object Tracking Network** for autonomous vehicles (improve the precision by 4%).
- Proposed a light-weight CNN in **PyTorch** to predict lens distortion parameters and remove distortion.
- Utilized pre-trained models with different backbones, such as **MaskRCNN**, to detect vehicles and lane lines to test the entire autonomous driving system with on-screen videos.

## Projects

**MEMO: Online Story Cards** MERN project
- Built a full stack App with responsive home and search function with **MongoDB, Node.js, and React.js**.
- Implemented the login system to allow **CRUD** operations, and deployed on **Heroku** and **Netlify**.

**FantasyAR: Machine Learning based AR Game** May 2022 – Aug. 2022
Capstone Peoject | SJTU FantasyAR
- Built a full stack AR fighting game using **Unity**, where player can encounter enemies on a mini-map and fight in real world.
- Applied the Natural Language Processing model *Recognissimo* to implement the voice-controlled skills.
- Implemented a back-end server and a database with **Node.js** to store information such as GPS locations.

**Asylum 7: 3D Horror Game** Feb. 2022 – Apr. 2022
Capstone Project | UMich Asylum 7
- Built a first-person horror and escape game with multi-levels using **Unity**
- Implemented the core features of the game with **C#**, including task management, enemy AI and navigation, detection of darkness, controls of trap and game story progression.

**Operating System Project** OS project
- Implemented a thread library (thread, cv, mutex), and a network file server with **C++**.
- Implemented a virtual memory manager which managed various application address space.
- Provided support for file and swap backed pages, alongside forking a process with a non empty arena.

## Research Experience

**An Improved Method for Full High Definition Demoiréing** Fall 2021
Independent research, advised by Dr.Jiong Chen HR-Demoire
- Proposed *netEdge* in **Pytorch** to predict the edge of moire-free images, which can reinforce the base network in low-resolution and select high-freq regions for the refine network (increase PSNR by 2.6%).
- Proposed a image processing pipeline to utilize a pre-trained low-resolution network to high-resolution: Down-sample → Demoiré → Multi-Stage Progressive Detail Restoration (increase PSNR by 5%).