




# Vincent Cai

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## EXPERIENCE

**Ulowa** | Java, Haskell, Agda, C, Bash, Assembly language, X86

**Teaching Assistant** | CS department | Iowa City, IA Jan 2023 – current  
CS:2230 Data Structures

- Led weekly discussion sessions teaching Java programming, guiding students in algorithm analysis for time and space complexity, and data structures selection for various tasks
- Supported students in implementing data structures, understanding their operations, and applying object-oriented programming (OOP) principles

CS:3820 Programming Language Concept

- Supported instruction in the functional programming language Haskell and programming proofs using Agda
- Established open communication via office hours, email, and resolved issues in collaboration with fellow TA

CS:2630 Computer Organization

- Instructed two cohorts of 20 students during 75-minute classroom sessions in a supportive learning environment
- Assistant in teaching C programming, Bash, assembly language programming, X86 Instruction Set Architecture (ISA), memory management, and CPU pipelining

**Casey's** | Scrum, C#/.NET, SQL, Microsoft Azure, Azure DevOps

**Software Engineering Intern** | Ankeny, IA May – Aug 2024

- Actively participated in Scrum ceremonies, developing effective communication and fostering teamwork throughout the software development lifecycle (SDLC)
- Solely responsible for the tech debt project of upgrading all Commerce Integration Platform applications to .NET 8, enhancing the CI/CD pipeline's efficiency and reliability
- Supported various IT initiatives, including documenting server vulnerabilities, decommissioning unused applications, removing EWS firewall rules, and contributing to system improvements

## MACHINE LEARNING PROJECTS

**VocalWave – Automatic Speech Recognition (ASR) System** in Progress

Python, NumPy, Kaldiio, JSON

- Completed: Implemented a data processing pipeline for ASR system, utilizing Kaldiio library for feature extraction, NumPy for matrix manipulation, and custom functions for splicing and subsampling of audio features

**Cross-Modality MRI Synthesis with CycleGANs**

May 2024

Google Colab, PyTorch, NumPy, Pandas, Matplotlib, MONAI

- Replicated a 2D CycleGAN model to translate between MRI modalities (T1&T2) using Vestibular-Schwannoma-SEG dataset
- Implemented advanced deep learning techniques including PatchGAN discriminators and residual-based generators for robust image transformation
- Integrated Adam optimizers with exponential decay schedulers to optimize GAN training, ensuring stable and efficient model convergence

## TECHNICAL SKILLS

**Languages:** Python, Java, C++, C#/.NET, JavaScript, HTML5/CSS3

**DS/ML Libraries & Frameworks:** PyTorch, Scikit-Learn, NumPy, Pandas, Matplotlib, Seaborn

**Databases:** MySQL, PostgreSQL, Microsoft SQL, MongoDB

**Tools & Technologies:** Jira, New Relic, Confluence, ServiceNow, Microsoft Azure, Azure DevOps, Git, Docker, HPC

## EDUCATION

**UNIVERSITY OF IOWA**

**Master's, Computer Science**

Anticipated May 2025 | Iowa City, IA  
GPA: 3.87/4.00

**Ph.D., Composition**

Dec 2023 | Iowa City, IA

## COURSEWORK

Machine Learning | Applied Machine Learning  
Mathematics of Machine Learning  
Artificial Intelligence | Theory of Computation  
Operating Systems | Database Systems  
Design and Implementation of Algorithms  
Designing Systems and Algorithms for Biomedicine

## HONORS & AWARDS

[Marcus Bach Graduate Fellowship](#)

Dissertation awards | 2023 | Ulowa

**Graduate College Summer Fellowship**

For summer research | 2021 | Ulowa

**Henry and Parker Pelzer Fellowship Award (x2)**

Composer of the year | 2017 & 2019 | Ulowa

## STRENGTHS

Teamwork & Collaboration | Strong Presentation & Communication Skills (Written & Oral) | Problem-Solving & Critical Thinking | Self-Motivated & Proactive | Hardworking & Committed to High Ethical Standards

## LANGUAGES

**English:** Full Professional Proficiency

**Mandarin Chinese:** Native

## INTERESTS

Group Fitness (Les Mills BODYCOMBAT, Les Mills BODYPUMP, HIIT, Power Yoga), Swimming, Piano, Music Composition, Self-improvement

