

# Vincent Cai

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## EXPERIENCE

### University of Iowa

**Teaching Assistant** | CS department | Iowa City, IA Jan 2023 – May 2025  
CS:4420 Artificial Intelligence (Spring 2025)

- Graded homework and held office hours to support students' learning in topics like Intelligent Agents, various Search algorithms, Bayesian Models and Networks, Markov Models, Feedforward and CNNs, RNNs, and Reinforcement Learning

CS:2230 Data Structures (Fall 2024)

- Led weekly Java programming discussions, guided students in algorithm analysis and data structure selection, and supported them in implementing data structures and applying OOP principles

CS:3820 Programming Language Concept (Spring 2024, Fall 2024))

- Supported instruction in Haskell and Agda, and maintained open communication through office hours and email, collaborating with fellow TAs to resolve issues.

CS:2630 Computer Organization (Spring 2023)

- Instructed two cohorts of 20 students in 75-minute sessions, teaching C programming, Bash, assembly language programming, X86 ISA, memory management, and CPU pipelining in a supportive learning environment

**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

**Rapid Diagnosis of Aortic Valve Insufficiency in Aortic Root Enlargement**

In progress

**Automatic Speech Recognition (ASR) System**

Dec 2025

Python, NumPy, Kaldiio, JSON

- Implemented a deep feedforward neural network for CTC with dynamic programming and Viterbi search, and replicated an ASR system with advanced techniques for efficient training and handling of large-scale audio datasets

**Cross-Modality MRI Synthesis with CycleGANs**

May 2024

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

- Replicated a 2D CycleGAN model for MRI modality translation (T1&T2) using advanced deep learning techniques and optimized training for stable convergence on the Vestibular-Schwannoma-SEG dataset

## TECHNICAL SKILLS

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

**DS/ML Libraries & Frameworks:** OpenCV, Insight Toolkit (ITK), nnU-Net, Scikit-Learn, PyTorch, NumPy, Pandas, Matplotlib, Seaborn

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

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

## EDUCATION

### UNIVERSITY OF IOWA

#### Master's, Computer Science

Anticipated May 2025 | Iowa City, IA

GPA: 3.74/4.00

#### Ph.D., Composition

Dec 2023 | Iowa City, IA

## COURSEWORK

Machine Learning | Applied Machine Learning  
Artificial Intelligence | Optimization Techniques  
Mathematics of Machine Learning  
Human-Computer Interaction  
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:** Primary proficiency

## INTERESTS

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