

Taiwei Cui

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Education

Northeastern University

San Jose, CA

M.S. IN COMPUTER SCIENCE

Sep. 2023 - May. 2025

Courses From NEU: CS5800 Advanced Algorithms, **CS5310 Computer Graphics**, **CS5330 Pattern Recognition & Computer Vision**, CS6220 Data Mining Techniques, **CS6120 Natural Language Processing**, CS8674 Master Project

Online Courses: Supervised Machine Learning (Stanford, coursera), CS162 Operating System

Nanjing Agricultural University

Nanjing, JiangSu(China)

B.S. IN COMPUTER SCIENCE

Sep. 2019 - Jun. 2023

Courses: **C/C++ Programming**, Advanced Algebra, Mathematical Analysis, Mathematical Statistics, Probability Theory, Complex Variable Functions, Real Variable Function, **Numerical Analysis**, Operations Research, Database System, Modern Algebra, Discrete Mathematics, Functional Analysis

Projects

Escher Tile Viewer

San Jose, CA

Nov 2024 - Now

Part of CS8674 Master Research project

Supervised by Crane Chen

In collaboration with **Adobe**.

Assisted the PI with the SIGGRAPH technical paper submission.

Developed an application for graphical tiling and pattern generation.

Sentiment Analysis of Customer Feedback for Airlines

San Jose, CA

Mar 2024 - May 2024

Leveraged **Long Short-Term Memory (LSTM)** networks to predict customer sentiment from reviews; Achieved 82% accuracy in sentiment classification, which is an 11% improvement over the baseline model (VADER, 71%).

Utilized **Span-ASTE (Span-Level Interactions for Aspect Sentiment Triplet Extraction)**, enhancing the model's ability to understand complex sentiment and aspect relationships within sentences.

Developed a regression model to predict customer ratings (on a scale of 1 to 10) based on sentiment analysis, allowing for a more nuanced understanding of customer satisfaction.

Online Shopping Platform in Java

San Jose, CA

Aug 2024 - Nov 2024

Developed an online shopping platform that allows users to search for products in the database using images or text. The application was developed in Java and deployed using **Docker** on **AMS**.

3D Snake Game OpenCV C++

San Jose, CA

Feb 2024 - Mar 2024

Developed an interactive 3D snake game utilizing advanced computer vision techniques in OpenCV C++.

Implemented camera calibration to accurately map camera images onto a 3D surface, ensuring precise interaction within the game.

Integrated Speeded-Up Robust Features (SURF) for feature detection, enabling accurate camera position and improving gameplay fluidity through optical tracking of real-world object movements.

Skills

Domains	Computer Graphics, Computer Vision, Applied ML, Software Engineer, Data Mining
Programming	C++, Python, Java
Tools and Libraries (C++)	Eigen, OpenCV, IMGui
Tools and Libraries (Python)	PyTorch, PyGame, PySpark, streamlit, Flask, SQLite3, Jina AI
Languages	English (Bilingual Proficiency), Mandarin (Bilingual Proficiency)

Work Experience

Research Assistant for Escher Tile Viewer (CS8674 Master Research project)

San Jose, CA

Jan 2025 - Now

Supervised by Crane Chen.

In collaboration with Adobe.

This project builds upon Adobe-inspired research on AI-based tile and pattern generation, extending its scope from flat surfaces to real-world objects such as clothing, accessories, and ornaments.

Explored existing MATLAB geometry code to understand and modernize it.

Teaching Assistant for CS5310 Computer Graphics

San Jose, CA

Jan 2025 - April 2025

Helped prepare framework code for homework assignments in ray tracing, Escher tiles, and related topics.

Held TA office hours to assist students.

Graded student homework.

Teaching Assistant for CS5330 Computer Vision and Pattern Recognition

San Jose, CA

Sep 2024 - Dec 2024

Prepared OpenCV workshop to help students get familiar with OpenCV quickly.

Prepared assignments on topics in computer vision, such as recognition and generative AI.

Held TA office hour to answer questions from students.

Graded homework from students

Java Programmer in Haohui Network Development Company

May 2023 - Jul 2023

Responsible for developing and maintaining the controller and service modules for address management to ensure that users can easily create, read, update, and delete addresses.

Developed programs using Postman and JUnit 4.

Learned to use Spring Boot and Redis in web development.

Researches

The study of enhancing the intelligibility of speech signals based on neural network models

Nanjing, Jiangsu

Oct 2022-Mar 2023

Researched noise suppression algorithms and neural networks, compiling a multi-SNR noisy signal dataset from TIMIT and Noisex-92. Explored various feature extraction methods (MFCC, spectrogram, log-power spectrum), and trained neural network models for noise suppression.

Evaluated performance based on signal intelligibility, SNR improvement, and model complexity, ultimately identifying the most effective feature extraction method.

The study on the semigroup structure of doubly super-stochastic matrices (Team Leader)

Nanjing, Jiangsu

Mar 2021-May 2022

Conducted a literature review on doubly sub-stochastic matrices, covering idempotence, Greens relations, and sub-stochastic properties. Proposed and proved properties of doubly super-stochastic matrices and their semigroup, including idempotence.

Led the project by organizing meetings, assigning tasks, and managing report writing, presentations, and defense sessions.

Publications

Gradient Penalty Cross Pseudo Supervision for Semi-Supervised Medical Image Segmentation

ISBI 2025

Peng Jin, Yuxuan Liu, Taiwei Cui

Service

LRVT (museum guide tour)

Nanjing, Jiangsu

Sep 2021-Nov 2021

Provided historical insights and narrated stories of significant figures from Chinas revolutionary wars to visitors.
Maintained public order and ensured a safe, respectful environment for visitors.

Personal

Sports Soccer, Pickleball

Violin Performed at school celebration events.