# Xijing Wang (Thomas)

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## EDUCATION

**Carnegie Mellon University** *School of Computer Science* **Pittsburgh, PA**
Master of Science: Major in ***Automated Science*** *Aug 2025 - May 2027*
Reward: *Director's Fellowship*

**Santa Clara University** *College of Art and Science* **Santa Clara, CA**
Bachelor of Science: Major in ***Computer Science(algorithm),*** Minor in ***Economics*** *Sep 2021 - March 2025*
Core Courses: *CSCI 164 Advanced Theory of Algorithm , CSCI 183 Data Science, CSCI184 Applied Machine Learning, CSEN 177 Operating System*

## RESEARCH EXPERIENCE

Lab of Cognitive and Computational Neuroscience **Santa Clara, CA**
*Research Assistant;* PI: *Dr. Lang Chen* *Nov 2023 - Now*

**Project: A neurocomputational basis of face recognition changes in ASD: E/I balance, internal noise, and weak neural representations (Under peer-review for publication)**
Received SCU REAL Program Summer Research Stipend ($4000)
.https://www.biorxiv.org/content/10.1101/2025.04.02.646903v1

- Utilized **OpenCV** for image editing, preparation of dataset and augmentation.
- Built **Computational Model(CNNs)** and **DL algorithm** by **Tensorflow/Keras** to study neuroscience theories in ASD.
- **Tuned critical hyperparameters** including kernel size, activation function(Relu), input resolution etc…
- Executed a systematic hyperparameter search, visualized learning curves with Matplotlib and conducted **Pearson-correlation matrix analysis** to link model activations with behavioral metrics under the support for the neuroscience framework

Complete presentations and compose research paper:

- **Oral Presentation:** Department of Psychology and Neuroscience Program, SCU, March 23, 2024.
- **Poster Presentation:**
  *Western Psychological Association 2024 Annual Conference, San Francisco, CA, April 27, 2024.*
  *CogSci 2025, San Francisco, CA, July-Aug 2025 (conference publication).*
- Manuscript: Currently under peer-review for publication

**Project: Pattern Separation for Faces in ASD** (current working on)

- Proposed a novel research approach comparing **computer-generated ratings** to human evaluations, and also proposed using multiple neural network models—including a basic **CNN**, pretrained **ResNet50**, and **Vision Transformer** —as computational frameworks to test neuroscience theories.
- Developed **automated algorithms** for dataset preprocessing to fulfill research goals, encompassing the organization and labeling of datasets for ASD studies
- Designed and integrated an algorithm for **generating face morphing images**, including identifying, testing, and adapting a GitHub library to ensure compatibility with the current ASD research project

**Other Lab Work:**

- Preprocessed **ASD brain imaging data** and uploaded it to the **High-Performance Computing Center**.
- Lab Website **maintenance** and **design**.

## SELECTED COURSE PROJECTS

**Building an IOS Food Recognition App** *Fall 2024*

*https://github.com/xthomaswang/FoodRecogProj*

Advisor: *Dr. Tiantian Chen*, Course: CSCI 184 *Applied Machine Learning*

- Fine-tuned a **MobileNet** model on a portion of the food 101 dataset for efficient image classification.
- Integrated the trained MobileNet model into an iOS mobile app using **Core ML** and **SwiftUI** to enable on-device food recognition.
- Designed and implemented the app's interface and framework, including real-time display of prediction results and model confidence levels to users.

**Differential and Distributional Privacy, Laplace vs SmallDB** *Spring 2023*

https://github.com/xthomaswang/Distributional-Differential-Privacy-and-Laplace-vs-SmallDB

Advisor: *Dr. Sara Krehbiel*, Course: CSCI 165 *Data Privacy and Algorithmic Fairness*

- Explained the **intricate relationship** between differential privacy and distributional privacy.
- Proved that Distributional Privacy is **strictly stronger** than Differential Privacy.
- Achieved the conclusion that the **Laplace Mechanism** performed better with **larger database sizes** (n) and that **SmallDB** excelled with **higher query dimensions** (k). The choice of **ε** (a parameter that determines the **level of noise** in a dataset) is particularly important for **trade-off** of data privacy and accuracy when the proportion of n to k is in balance.

**Analysis of Relationship Between Age Groups and Sleep Quality/Duration *with Life Habits*** *Fall 2023*

Advisor: *Dr. Smita Ghosh,* Course: *CSCI:183 Data Science*

- Analyzed sleep patterns and lifestyle factors using datasets from Kaggle, focusing on how age affects sleep quality and disturbances, including **Data Preprocessing** steps.
- Utilized advanced data analysis techniques with tools such as **Jupyter Notebook**, **Pandas**, **Seaborn**, **Matplotlib**, and **Scikit-learn** to investigate sleep efficiency, revealing insights into the impact of caffeine, alcohol, and exercise across various age groups.
- Visualized and Extracted patterns and relationships from complex data to develop a function aimed at **Predicting** lifestyle impacts on sleep quality, leveraging **Statistical Analysis** and **Machine Learning** techniques for predictive insights into sleep health improvement strategies.

## LEADERSHIP EXPERIENCE

**Production Club – Director** **Woodstock, CT**

https://www.youtube.com/watch?v=lbT5cw2aFb8

*Woodstock Academy* *May 2019*

- Partnered with a local industrial company to produce a **Documentary-Style** video for the "What's so Cool about Manufacturing?" EAMA's 5th Annual Student Video Competition (2019), showcasing their work and achievements—winning **Most Creative** and **Best Narration Prizes**.

## SKILLS & Others

**Programming Languages:** Python, C++, JavaScript, Java, Scala, Go, R, MySQL, HTML/CSS,
**Programming Tools/Libraries:** Keras, Pytorch, TensorFlow, OpenCV, Transformers, CUDA, etc.
**Others:** Linux, Computational Models, ML/DL algorithms, Optimization, Fast Learner, Problem Solving.
**Interests:** Singing, Music Production, Guitar, Delicious Food, Video Games, Hiking, Road-Trip.