

Xuanzhou Chen

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EDUCATION

- **New York University** Brooklyn, NY
M.S. in Computer Engineering (Expected) 09/2021-05/2023
- **University of Wisconsin Madison** Madison, WI
B.Sc. in Mathematics and UCrt. in Computer Sciences 08/2018-12/2020
- **China Agricultural University** Beijing, China
B.Sc. in Mathematics and Applied Mathematics 08/2016-06/2018

PROGRAMMING SKILLS

- **Languages:** Python, TensorFlow, PyTorch, Shell, Java, MATLAB, C++

RESEARCH & TEACHING EXPERIENCE

- **Fast Attack on Text Classifier and Machine Translator** New York University
Summer Research Assistant, Advisor: Siddharth Garg 06/2022–Present
 - **Main Work:** 1. Modified Projected Gradient Descent Attack referencing on original paper *Block-Sparse Adversarial Attack to Fool Transformer-Based Text Classifiers*. 2. Designed a new clustering algorithm in semantic searching using modified K-means based on cosine similarity to accelerate the PGDattack. 3. Performed modified PGDattack on GPT2 as a text classifier. 4. Results: attack time decreased by at least 90% compared to baseline. 5. Attempted to transfer modified PGDattack on GPT models in Neural Machine Translation.
- **NYU K12 Summer ML Teaching** New York University
Instructor 06/2022–08/2022
 - **Main Work:** 1. Gave theoretical and programming lectures on ML&DL, topics including linear regression, overfitting and regularization, linear classification, convolutional neural networks, etc. 2. Guided high school students to work on ML/DL group projects and their final presentations.(Github Link)
- **Paper Reading: Channel Polarization** New York University
Information Theory Course Research Project, Advisor: Elza Erkip 04/2022-05/2022
 - **Main Work:** 1. Wrote an IEEE format short report on the paper *Channel Polarization: A Method for Constructing Capacity-Achieving Codes for Symmetric Binary-Input Memoryless Channels*. 2. Explained main theorems including polarization, encoding, decoding, construction, performance analysis. 3. Proved the upper bound of the probability of block error under successive cancellation decoding.
- **Channel-Combined Transformer on NMT** New York University
DL Course Research Project, Advisor: Siddharth Garg 03/2022-05/2022
 - **Main Work:** 1. Combining channels with standard transformer architecture to build channel-combined transformer. 2. Used additive white gaussian noise(AWGN) to perturb the input textual data. 3. Fine-tuned erasure/crossover probability p and run corresponding experiments to compare machine translation performance between the channel-combined transformer and original transformer.
 - **Preliminary Results:** 1. Computational time dropped by 8% with only 0.4% loss of validation accuracy. 2. The channel-combined transformer outperforms original transformer in terms of semantic meaning preservation. (Github Link)
- **Social Media Bots** University of Wisconsin-Madison
Co-author 03/2020-12/2020
 - **Main Work:** 1. Researched on the activities and strategies of Twitter bots during Covid-19, and revealed their influence on users' opinions. 2. Scrapped Twitter keyword data via Python Scrapinghub and performed bot detection through Machine Learning based Botometer. 3. Adopted unsupervised Structural Topic Modeling (STM) and Vector Auto Regression(VAR) time series analysis to reflect the change in the agenda of news coverage and public conversation.
 - **Publication:** The work has been presented at ICA 2020.(Link)

• **Microscope Image Processing Project**

Zhejiang University

Full-time Research Assistant, Advisor: Yingke Xu

06-08/2018 & 03-07/2021

- **Main Work:** 1. Collected the tumor cell microscopic image data from the Zhejiang University affiliated hospitals. 2. Preprocessed the image data by data augmentations using keras and cropping it into small patches to generate more training samples. 3. Adopted pre-trained U-Net model and used Dice similarity coefficient as loss function for training on tumor cell segmentation task. MIOU in 3-fold cross-validation experiment achieved at $\sim 81.4\%$.

INTERNSHIPS & OTHER PROJECTS

• **Resnet-18 improvement on CIFAR10**

New York University

DL Course Project

01/2022-03/2022

- **Main Work:** 1. Built the ResNet model from scratch using Pytorch. 2. Explored the best performance of ResNet model on CIFAR 10 dataset using around 4.9M total training parameters by modifying model structures, choosing regularization schemes, defining batch size and epoch settings, as well as adopting data augmentations to maximize the test accuracy. 3. The best test accuracy of the model on CIFAR10 testset at 92%. (Github Link)

• **Java Game: Bubble Arena**

New York University

Java Individual Course Project

11/2021-12/2021

- **Main Work:** 1. Programmed an offline multi-player game in Java from scratch and adopted MVC design pattern as main game structure. 2. Used Property files separately to make the game extension. 3. Utilized Singleton Pattern, Factory Pattern, Template Pattern and other patterns in designing and programming. (Video Link)

• **WebCRA**

Amazon Remote

Research Intern

09/2020-11/2020

- **Main Work:** 1. Developed, tested, and deployed a full-stack web application with HTML, JS, JQuery and Flask, the application fetches and analyzes on-line customer reviews. 2. Adopted data cleaning, denoising, tokenization and normalization, calculated token frequency distributions, found out the statistically significant different tokens, and used word cloud for data visualization.

• **Operation Analysis**

Lufax Holding, Ltd.

Operation Analyst Intern

06/2019-08/2019

- **Main Work:** 1. Assisted to inspect the payment channels and daily accounts of each product line. 2. Carried out data analysis including data collection and visualization for financial reporting using Excel, R, and Tableau.

PUBLICATION & AWARDS & HONORS

- **Publication:** Duan, Z., Lukito, J., Li, J., Chen, X., Shah, D., Yang, S.(2020). *Bot as Strategic Communicator in the Digital Public Space: Evidence for Algorithmic Agenda-Setting during the COVID-19 Pandemic*. 2020 Annual Conference of International Communication Association (ICA)
- **Honors:** *S grade* in The Mathematical Contest in Modeling (MCM), 2018
- **Awards:** Dean's list at UW-Madison