



# JUSTIN CHIH-YAO CHEN

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## EDUCATION

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### The University of North Carolina at Chapel Hill

*Ph.D. student in Computer Science.*

**Chapel Hill, NC**

*Aug. 2023 – Present*

### National Taiwan University

*Master of Data Science. GPA: 4.10 / 4.30*

**Taipei, Taiwan**

*Sep. 2020 – Jun. 2022*

### National Cheng Kung University

*Bachelor of Statistics, Double Major in Computer Science. GPA: 3.93 / 4.30*

**Tainan, Taiwan**

*Sep. 2016 – Jun. 2020*

## HONOR & AWARDS

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### College Student Research Creativity Award (Out of 2,689 Research)

*Ministry of Science and Technology, Taiwan*

**2020**

### Honorable Mention Award, Big Data and Business Analysis Competition

*Department of Finance, National Sun Yat-sen University*

**2018**

### Cathay United Bank Undergraduate Scholarship

*Cathay Life Insurance Company*

**2017**

### Academic Excellence Award (Top 10%)

*Department of Statistics, National Cheng Kung University*

**Fall 2016**

## PUBLICATIONS (\*CO-FIRST AUTHOR)

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[1] Nicholas Collin Suwono, **Chih Yao Chen**, Tun Min Hung, Ting-Hao Kenneth Huang, I-Bin Liao, Yung-Hui Li, Lun-Wei Ku, Shao-Hua Sun. “Location-Aware Visual Question Generation with Lightweight Models” The 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP’23). Dec 6-10, 2023.

[2] **Chih-Yao Chen**, Tun-Min Hung, Lun-Wei Ku. “Label-Aware Hyperbolic Embeddings for Fine-grained Emotion Classification” The 61st Annual Meeting of the Association for Computational Linguistics (ACL’23). July 9-14, 2023.

[3] **Chih-Yao Chen**, Dennis Wu, Lun-Wei Ku. “HonestBait: Forward References for Attractive but Faithful Headline Generation.” The 61st Annual Meeting of the Association for Computational Linguistics (ACL’23). July 9-14, 2023.

[4] Yi-Zhan Xu\*, **Chih-Yao Chen**\* and Cheng-Te Li. “SUVR: Search-based Unsupervised Visual Representation Learning.” IEEE International Conference on Acoustics, Speech and Signal Processing 2023 (ICASSP’23).

[5] **Chih-Yao Chen** and Cheng-Te Li. “ZS-BERT: Towards Zero-Shot Relation Extraction with Attribute Representation Learning.” The Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL’21), Jun.6-11, 2021.

[6] Yu-Che Tsai, **Chih-Yao Chen**, Shao-Lun Ma, Pei-Chi Wang, You-Jia Chen, Yu-Chieh Chang, and Cheng-Te Li. “FineNet: A Joint Convolutional and Recurrent Neural Network Model to Forecast and Recommend Anomalous Financial Items.” ACM International Conference on Recommender Systems (RecSys’19). Sep.16-20, 2019.

## PREPRINTS (\*CO-FIRST AUTHOR)

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[1] **Chih-Yao Chen**\*, Swarnadeep Saha\* and Mohit Bansal. “MAGDI: Structured Distillation of Multi-Agent Interaction Graphs Improves Reasoning in Smaller Language Models”

[2] **Chih-Yao Chen**, Swarnadeep Saha and Mohit Bansal. “ReConcile: Round-Table Conference Improves Reasoning via Consensus among Diverse LLMs.”

[3] Wen-Ming Chung, **Chih-Yao Chen**\* and Cheng-Te Li. “Towards Robustness Enhanced Rumor Detection with Graph Contrastive Learning.”

## RESEARCH EXPERIENCE

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### Department of Computer Science

Research Assistant, Multimodal Understanding, Reasoning, and Generation for Language Lab

Chapel Hill, NC

Aug. 2023 – Present

#### ► Improved LLM Reasoning through Multi-Agent Collaboration

- Improved LLM reasoning on a wide range of tasks by up to 7.7% compared to the leading baseline
- Enhanced GPT4's performance by an absolute 10% of accuracy
- The tweet of this paper has received more than 440,000 views

#### ► Distillation from Teacher Discussions

- Showed that the discussion among teachers helps improve the student more
  - Fine-grained conversation modeling significantly boosted the student performance by 9.8% using only 1,000 samples
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### Institute of Information Science, Academia Sinica

Research Assistant, Natural Language Processing and Sentiment Analysis Lab

Taipei, Taiwan

Jul. 2020 – Dec. 2022

#### ► Attractive Headline Generation

- Created intriguing but trustworthy headlines by reinforcement learning, making verified news more interesting
- Improved 29.5% attractiveness compared to the baseline and 11.25% compared to human-written headlines
- Increased 22.3% faithfulness compared to the baseline and are comparable to verified news headlines

#### ► Fine-grained Emotion Classification

- Incorporated hyperbolic space to improve fine-grained emotion classification
  - Enhanced fine-grained emotion classification by 2.0% F1 score across two benchmark datasets
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### Institute of Data Science, National Cheng Kung University

Research Assistant, Networked Artificial Intelligence Lab

Tainan, Taiwan

Jun. 2018 – Jun. 2020

#### ► ZS-BERT: Zero-shot Relation Extraction

- Innovatively formulated relation extraction task under a zero-shot setting
- Significantly improved F1 score for up to 22.7% compared to the previous state-of-the-art

#### ► FineNet: Financial Recommender System and Anomaly Detection

- Built a hybrid recommender system using CNN and LSTM to predict the price of funds and rank them daily
- Recommended items with the best chance to long/short based on the price prediction

#### ► Deep Relation Explorer: Automatically Discover Relationship between Grouped Entities

- Assisted users in discovering connections, relationships, and familiarity between entities
  - Let the user input arbitrary names (e.g., celebrities, politics, companies) and visualize the relation between them
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## TEACHING EXPERIENCE

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### MediaTek

Lecturer of Deep Learning Training Program

Hsinchu, Taiwan

Apr. 2021 – Apr. 2022

- Introduced Transformers to the senior engineers at MediaTek, a world's Top 3 IC design company
- Led the hands-on coding, which addresses sentence classification and image captioning

### Taiwan AI Academy

Lecturer of Natural Language Processing Training Program

Taipei, Taiwan

Aug. 2022

- Elaborated a wide variety of state-of-the-art NLP models and compare their strength and weakness
- Taught the fundamental of statistical and neural language models and the code implementation

## WORKING EXPERIENCE

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### Codementor

*Data Scientist Intern*

Taipei, Taiwan

Jul. – Aug., 2019

- Built the recommender system by creating a pipeline from data processing and model training to a RESTful API
- Increased AUC by 34%, and the effectiveness was confirmed by an A/B test

## COMPETITION

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### Hackathon: In-car Smart Tourist System

2022

*Team leader*

- Hosted by Academia Sinica and Foxconn, the world's largest technology manufacturer
- Led the team to successfully built the intriguing and instructive dialog system in two days

### Big Data and Business Analysis Competition

2018

*Model designer, report writer and presenter*

- Modeled multiple price index and financial news content to predict real world funds price
- Largely improved MAE by 3.1%, and had received honorable mention award out of 35 teams

## PROJECTS

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### MultiWriter: Multi-headline Generation System

2021

- Generated multiple headlines which could be used on social media, formal news platforms or subheadings
- Collected headlines for the same event from different platforms using Selenium to fine-tuned train the model

### Stock Trading Bot

2020

- Combine EMA, MACD, Bollinger band and volume to decide long/short direction and position
- Backtest results for 2020 and 2021 outperform the market by 5.4% and 3.1%, respectively

## EXTRACURRICULAR

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### Home for the Disabled

2018

*Volunteer*

Tainan, Taiwan

- Accompanied the wheelchair user and provide prompt assistance when they had difficulty eating or moving
- Filled out a request form to make using public transit more convenient for wheelchair users

## SKILLS

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**Programming:** Python, PyTorch, Tensorflow, Keras, Flask, Linux, GCP, AWS, PostgreSQL, MySQL

**Language:** English (fluent), Mandarin (native)

## REFERENCE

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**Prof. Mohit Bansal** (mbansal@cs.unc.edu)

*Department of Computer Science, UNC Chapel Hill*

**Relationship:** PhD advisor, director of the Multimodal Understanding, Reasoning, and Generation for Language Lab

**Dr. Lun-Wei Ku** (lwku@iis.sinica.edu.tw)

*Institute of Information Science, Academic Sinica*

**Relationship:** master's advisor, director of the Natural Language Processing and Sentiment Analysis Lab

**Prof. Cheng-Te Li** (chengte@ncku.edu.tw)

*Institute of Data Science, National Cheng Kung University*

**Relationship:** undergraduate advisor, director of the Networked Artificial Intelligence Lab

**Prof. Jyh-Shing Roger Jang** (jang@csie.ntu.edu.tw)

*Department of Computer Science and Information Engineering, National Taiwan University*

**Relationship:** internship mentor, director of the Multimedia Information Retrieval Lab