Ye Chenchen

Homepage: yecchen.github.io

E: chenchenye.ccye@gmail.com | M: +65 85353195

EDUCATION

National University of Singapore, Singapore   *AUG 2018 – JUN 2022*

Bachelor of Computing, Computer Science

• **CAP:** 4.71/5.00, **1st Class Honors (Highest Distinction)**

• **Specializations**: Artificial Intelligence [certificate]; Multimedia Information Retrieval [certificate]

• **Bachelor Dissertation**: *"Revisiting Response Generation for Task-oriented Multimodal Dialogue"* (**A+**)

  Supervisor: Dr. Chua Tat Seng, KITHCT Chair, NUS; Director, NUS-Tsinghua Extreme Search Center (NExT)

  Mentor: Dr. Liao Lizi, Assistant Professor at Singapore Management University

AWARDS & HONOURS

- Outstanding Undergraduate Researcher Prize. NUS.   *2022*
  - **$1000**, **Best** undergraduate researcher (individual) in the **university-wide selection** [certificate].
- Deans' List Awards. NUS, School of Computing.   *AY 2019 – 2020, AY 2021 – 2022*
  - **Top 5%** of the cohort [certificate].
- Science & Technology Undergraduate Scholarship. NUS.   *2018 – 2022*
- Senior Middle 2 Scholarship. Ministry of Education, Singapore.   *2018 – 2022*
  - **Outstanding** Asian student, covers full tuition fees and living allowance.

PUBLICATIONS

1. **Reflecting on Experiences for Response Generation**. [**PDF**] [**Poster**] [**Slides**] [**Video**]

   Chenchen Ye, Lizi Liao, Suyu Liu, Tat-Seng Chua

   In Proceedings of the 30th ACM International Conference on Multimedia (MM '22), October 2022. (**Full** paper)

2. **Structured and Natural Responses Co-generation for Conversational Search.** [**PDF**] [**Code**] [**Slides**] [**Video**]

   Chenchen Ye, Lizi Liao, Fuli Feng, Wei Ji, Tat-Seng Chua

   In Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR '22), July 2022. (**Full** paper accepted for **oral presentation**)

RESEARCH INTERESTS

My primary research interests are **Information Retrieval (IR)** and **Knowledge Reasoning** over **multi-modal data (text, image, graph data, etc)**. Specifically, I aim at developing models that can reason over **heterogeneous knowledge**, coordinate the structured and unstructured, and generate appropriate interpretations.

Past/Current research sub-directions:

• **Conversational Search and Response Generation**

  (Information search with interactive textual/ multimodal agent)

• **Knowledge Reasoning over Knowledge Graph**

  (Reasoning with world knowledge, and considering temporal dynamics and multi-modalities)

RESEARCH EXPERIENCE

Research Assistant *AUG 2022 - Present*

NExT Research Center, National University of Singapore

- **Project: Event Forecasting in Temporal Knowledge Graph with Multimodal Data**
- Construct new dataset for Event Temporal Knowledge Graph, which offers multimodal knowledge including crawled event documents and images along with structured event triplets (subject, relation, object) for further research.
- Explore a novel direction for event forecasting in TKG by accounting for enriched semantics from event text.

Undergraduate Student Researcher *MAY 2021 – JUN 2022*

NExT Research Center, National University of Singapore

- **Project: Multimodal Conversational Search and Response Generation**
- Incorporated supervised multitask learning and reinforcement finetuning in building a novel conversational search system that co-generates both structured search states for system optimization and natural language responses for users.
- Proposed and implemented a neural case-based reasoning model for task-oriented multimodal dialogues; enhanced its performance with contrastive learning for multi-modality retrieval and copying mechanism for response generation.

PROJECTS

Towards Empathetic Music Generation System [Proposal] [PDF] *JAN 2021 – APR 2021*

Student Researcher (Conceptualization, Implementation, Investigation, Writing) (Kaldi & Pytorch, Media)

Supervisor: Dr. Wang Ye, Associate Professor, NUS

- Proposed an automatic Midi music generation system that is controllable to express a given emotion based on conditional variational autoencoder.
- Explored different musical-emotion classification models for evaluation, including SVM and MLP, LSTM, and GPT-2.

Deep Q-Learning Agent for Crossing Road *OCT 2020 – NOV 2020*

Algorithm Programmer (Python, Reinforcement Learning)

- Implemented an AI agent using Deep Q-Learning (DQN) to process large-scale non-deterministic planning problems, where an object needs to cross a busy multi-lane road with moving cars at different speeds.
- Improved the final accuracy by applying curriculum training and reward shaping to the convolutional DQN model.

Deepfake Video Detection Using Neural Networks [PDF] [Code] *FEB 2020 – MAY 2020*

Student Researcher (Conceptualization, Implementation, Investigation, Writing) (Keras, Computer Vision)

Supervisor: Dr. Bryan Kian Hsiang Low, Associate Professor, NUS; Director of AI Research, AI Singapore

- Applied Xception Net with depthwise separable convolution layers to classify video streams into those with human-manipulation and those without.
- Compared model with other implementations, including CNN-based Meso-4, MesoInception-4 model, and LSTM.

K-Puzzle & Sudoku Completion *FEB 2020 - MAY 2020*

Algorithm Programmer (Python)

- Implemented A* Graph Search Algorithm with different admissible and consistent heuristics for k-dimensional puzzles.
- Applied Constraint Satisfaction Problem (CSP) with backtracking to solve Sudoku puzzles, and investigated the efficiency of different heuristics, such as various variable & value selecting and domain reducing heuristics.

WORK EXPERIENCE

R&D Intern in NLP Team *JUN 2020 – AUG 2020*

YITU Technology, Singapore

• Investigated algorithms for Knowledge-based Question Answering (KBQA), especially for multi-constraints questions.

• Constructed a QA dataset that accurately captures the company's business with richer language.

• Implemented a BERT-based Relation Extraction model that increases the accuracy and recall of the QA system.

TEACHING EXPERIENCE

Teaching Assistant *JAN 2020 - MAY 2020*

School of Computing, National University of Singapore

• CS2030 Programming Methodology II, *Lecturer: Dr. Henry Chia Wai Kit*

• CS2040 Data Structure and Algorithm, *Lecturer: Dr. Chong Ket Fah*

LEADERSHIP EXPERIENCE

Inter-generational Learning Program (NUS & Family Central) *FEB 2021 - APR 2021*

Team Leader, Event Organizer

• Responsible for liaison and coordination between parties to conduct the program smoothly, aiming at encouraging seniors to maintain an active life and learn new skills through paired learning with student volunteers.

• Led a core team of 4 members, trained 20 volunteers, and oversaw the timeline, contents, and sessions.

NUS Student Environmental Protection Organization *AUG 2017 – AUG 2018*

President, Event Organizer

• Led a group of 11 core committee members organizing an environmental protection awareness campaign which attracted 120 students from the National University of Singapore and the Nanyang Technological University to participate.

• Responsible for the campaign publicity and security issues, and adjusted volunteers' tasks according to emergencies.

Student Service-Learning Program (NUS & Sunshine Welfare Action Mission) *FEB 2018 - MAY 2018*

Event Organizer, CFO of the volunteer group

• Conceived and organized monthly volunteer sessions with SWAMI Home and successfully brought warm connections to the Dementia patients and the elderly through well-prepared content.

• Monitored finance to ensure the team works within the budget and prepared facilities and devices in advance.

SKILLS, CERTIFICATIONS & OTHERS

• **Programming Languages:** Python, Java, C++, C, SQL (MySQL, PostgreSQL), R, Matlab

• **Software & Other IT Skills:** PyTorch, TensorFlow, Tableau, Kaldi, Git, Linux

• **Languages:** English (Proficient, TOEFL iBT Score: 108/120), Chinese (Native), Korean (Basic)

• **Co-curricular Activities:** Core member of the Activity Department in NUS Chinese Society, Member of the Data Science Workshop Team in NUS Statistics Society

REFERENCES

- **Chua Tat-Seng** (Bachelors Dissertation Advisor & Research Assistantship Supervisor)
  KITHCT Chair Professor
  School of Computing, National University of Singapore
  Director, NUS-Tsinghua Extreme Search Center (NExT)
  dcscts@nus.edu.sg

- **Liao Lizi** (Bachelors Dissertation Advisor)
  Assistant Professor
  School of Computing and Information Systems, Singapore Management University
  lzliao@smu.edu.sg

- **Wang Ye** (Multimedia Course Lecturer and Supervisor)
  Associate Professor
  School of Computing, National University of Singapore
  Director, NUS Sound and Music Computing (SMC)
  wangye@comp.nus.edu.sg

- **Chong Ket Fah** (Teaching Assistantship Supervisor)
  Lecturer
  School of Computing, National University of Singapore
  chongket@comp.nus.edu.sg