

Hao ZHANG

COMPUTER SCIENCE · RESEARCH ENGINEER · PH.D. CANDIDATE

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Summary

I am a research engineer at Artificial Intelligence Initiative (A*AI), **Agency for Science, Technology and Research (A*STAR)**. I have been involved in several industrial/research projects in different directions, which include visual grounding, natural language processing, commonsense knowledge graph and reinforcement learning for robotics.

Meanwhile, I am also a part-time Ph.D. candidate at Data Management and Analytics Lab (DMAL), School of Computer Science and Engineering (SCSE), **Nanyang Technological University (NTU)**. My supervisor is Prof. **Aixin SUN** (NTU) and co-supervisor is Dr. **Joey Tianyi Zhou** (A*STAR). My primary research interests are *Natural Language Processing (NLP)* and *Machine Learning*. Currently, my research focuses on visual reasoning (e.g. vision-language tasks) and transfer learning for NLP (e.g. knowledge transfer for low-resource language, meta-learning for multiple-choice QA).

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Education

Nanyang Technological University (NTU)

PH.D. CANDIDATE IN COMPUTER SCIENCE

50 Nanyang Avenue, SG 639798

Aug 2019 - Present

Supervisor: Prof. **Aixin SUN** (NTU) · Co-supervisor: Dr. **Joey Tianyi ZHOU** (A*STAR)

Data Management and Analytics Lab (DMAL), School of Computer Science and Engineering (SCSE)

Nanyang Technological University (NTU)

M.SC. IN COMMUNICATIONS ENGINEERING

50 Nanyang Avenue, SG 639798

Aug 2015 - Jul 2016

School of Electrical and Electronic Engineering (EEE)

Dalian University of Technology (DUT)

B.ENG. IN COMMUNICATIONS ENGINEERING

Dalian City, P. R. China, 116024

Sep 2011 - Jul 2015

School of Information and Communication Engineering (SICE)

Experience

Artificial Intelligence Initiative (A*AI), A*STAR

RESEARCH ENGINEER

1 Fusionopolis Way, SG 138632

Jun 2018 - Present

- **Human-Robot Collaborate AI for Advanced Manufacturing Engineering (AME) Project.** The objective is to use planning, reinforcement learning and implicit learning techniques for concept grounding and human-interactive task learning to achieve efficient and easy-to-use Automatic Robotic Programming and Human-Robot Collaboration. I am responsible for the concept grounding and learning, which includes object detection, event localization, concept knowledge graph and vision-language learning.

Social & Cognitive Computing (SCC), A*STAR

RESEARCH ENGINEER

1 Fusionopolis Way, SG 138632

Jul 2016 - May 2018

- **PrimeNet Project: Human-inspired Framework for Commonsense Knowledge Representation and Reasoning.** The objective is to set out a framework for a commonsense knowledge base that allows for efficient processing, in order to meet the demands of commonsense reasoning and, hence, support intelligent machine performance in real-world tasks. At the same time, the PrimeNet still provide access to a vast knowledge resource of concepts involving specific object instances.
- **MARACANA Project: Behavioural Understanding and Narrative Descriptions from Videos.** The objective is to develop technology components that can analyze and narrate real world events captured in video, and provide the human user with a rapid understanding of the happenings in an environment. I am responsible for commonsense reasoning/learning, activity recognition in cognitive linguistic temporal-spatial representation and narrative scene description.

Publications

First-Author Publication

(* indicates equal contribution)

[4] RoboCoDraw: Robotic Avatar Drawing with GAN-based Style Transfer and Time-efficient Path Optimization

Tianying Wang*, Wei Qi Toh*, **Hao Zhang***, Xiuchao Sui, Shaohua Li, Yong Liu, Wei Jing

Thirty-Forth AAAI Conference on Artificial Intelligence (AAAI), 2020.

[3] Dual Adversarial Transfer for Sequence Labeling

Joey Tianyi Zhou*, **Hao Zhang***, Di Jing, Xi Peng

IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2019.

[2] Dual Adversarial Neural Transfer for Low-resource Named Entity Recognition

Joey Tianyi Zhou*, **Hao Zhang***, Di Jing, Hongyuan Zhu, Rick Siow Mong Goh, Kenneth Kwok

The 57th Annual Meeting of the Association for Computational Linguistics (**ACL**), 2019. (**oral**)

[1] RoSeq: Robust Sequence Labeling

Joey Tianyi Zhou*, **Hao Zhang***, Di Jing, Xi Peng, Yang Xiao, Zhiguo Cao

IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**), 2019.

Co-Author Publication

[4] Efficient Robotic Task Generalization Using Deep Model Fusion Reinforcement Learning

Tianying Wang, **Hao Zhang**, Wei Qi Toh, Hongyuan Zhu, Cheston Tan, Yan Wu, Yong Liu, Wei Jing

The 2019 IEEE International Conference on Robotics and Biomimetics (**ROBIO**), 2019.

[3] Learning With Annotation of Various Degrees

Joey Tianyi Zhou, Meng Fang, **Hao Zhang**, Chen Gong, Xi Peng, Zhiguo Cao, Rick Siow Mong Goh

IEEE Transactions on Neural Networks and Learning Systems (**TNNLS**), 2019.

[2] Action Hierarchy Extraction and its Application

Huminski Aliaksandr, **Hao Zhang**

The 11th edition of the Language Resources and Evaluation Conference (**LREC**), 2018.

[1] WordNet Troponymy and Extraction of Manner-Result Relations

Huminski Aliaksandr, **Hao Zhang**

The 9th Global WordNet Conference (**GWC**), 2018.

Theses

Removing Backscatter to Enhance the Visibility of Underwater Object

Supervisor: **Lap Pui CHAU**

Master of Science (M.Sc.), School of Electrical and Electronic Engineering, Nanyang Technological University

Research on an Improved Method for Image Enhancement Based on the Retinex Theory

Supervisor: **Hongyu WANG**

Bachelor of Engineering (B.Eng.), School of Information and Communication Engineering, Dalian University of Technology

Professional Services

2019 **Program Committee Member**, The Association for Computational Linguistics (ACL)

Honors & Awards

2019	Certificated , The Scientific Writing Skills Workshop Courses	Singapore
2018	1st Runner Up , Artificial Intelligence (AI) Hackathon in Agency for Science, Technology and Research	Singapore
2015	Outstanding Graduates , Dalian University of Technology	P. R. China
2013	Second Prize , Higher Education Press Cup College Student Mathematical Modeling Contest (National Level)	P. R. China
2013	First Prize , Higher Education Press Cup College Student Mathematical Modeling Contest (Provincial Level)	P. R. China
2013	Certificated , Undergraduate Innovation and Entrepreneurship Training Program (National Level)	P. R. China
2013	Second Prize , ACM/ICPC The Third Dalian City Programming Contest	P. R. China
2012, 2014	Learning Excellence Award (Second Prize) , Dalian University of Technology	P. R. China
2012, 2013	Technological Innovation Award , Dalian University of Technology	P. R. China