

# 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).

**Personal Email:** isaac DOT changhau AT gmail DOT com

## Education

### Nanyang Technological University (NTU)

50 Nanyang Avenue, SG 639798

PH.D. CANDIDATE IN COMPUTER SCIENCE

Jul 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)

50 Nanyang Avenue, SG 639798

M.SC. IN COMMUNICATIONS ENGINEERING

Aug 2015 - Jul 2016

School of Electrical and Electronic Engineering (EEE)

### Dalian University of Technology (DUT)

Dalian City, P. R. China, 116024

B.ENG. IN COMMUNICATIONS ENGINEERING

Sep 2011 - Jul 2015

School of Information and Communication Engineering (SICE)

## Experience

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

1 Fusionopolis Way, SG 138632

RESEARCH ENGINEER

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

1 Fusionopolis Way, SG 138632

RESEARCH ENGINEER

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

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### 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

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

## Honors & Awards

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