

CHI HAN

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RESEARCH INTERESTS

I am interested in understanding and engineering humans' way of modeling the physical world and logical reasoning in computational terms. How do we represent the visual scenes we see? How do we acquire common sense knowledge? Most important of all, what assumptions are encoded before learning these capabilities, and how much of them can be a learned thing?

EDUCATION

Tsinghua University, Beijing, P.R.China

2016 -

Present

Currently an undergraduate in Yao Class (Computer Science Experimental Class),
Institute of Interdisciplinary Information Science

GPA: 3.73/4.0

PUBLICATIONS

Chi Han*, Jiayuan Mao*, Chuang Gan, Joshua B. Tenenbaum, and Jiajun Wu.
Visual Concept-Metaconcept Learning. In Advances in Neural Information
Processing Systems (*NeurIPS*), 2019

RESEARCH EXPERIENCES

Project: Learning concepts and metaconcepts from images and associated question-answer pairs. **Spring - Fall 2019**

Paper: Visual Concept - Metaconcept Learning, accepted by NeurIPS 2019

Role: co-first author of the paper. Work was done when I was a research intern in Computational Cognitive Science Group, mentored by Prof. Joshua Tenenbaum.

Objective: Humans reason with concepts and metaconcepts: we recognize *red* and *green* from visual input; we also understand that they *describe the same property of objects* (i.e., the color). We propose the visual concept-metaconcept learner (VCML) model for joint learning of concepts and metaconcepts from images and associated question-answer pairs. We demonstrated that with grounding cues provided by visual representations, the model is able to predict relations between

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Computer Science Ph.D. Applicant

unseen pairs of concepts. Meanwhile, knowledge about metaconcepts empowers the model to learn visual concepts from limited, noisy, and even biased data.

Project: Learning Interpretable Object-Based Model in an Unsupervised Way.

Summer - Fall 2018

Role: research intern in Machine Intelligence Group at Tsinghua, Mentored by Prof. Chongjie Zhang

Objective: current results show that, the neural network model we're developing can learn to classify objects, even in object-dense environments like Sokoban. It produces readable object-maps for different kinds of them, and predicts the future layouts conditional on actions, in an end-to-end manner. The model is thus able to generalize to different layouts, and deal with stochastic objects by learning the future distribution of different objects.

HONORS AND AWARDS

Scholarship for Freshman, Tsinghua University

2016

Awarded to top 10% freshmen in Tsinghua University.

Tsinghua Xuetao Talents Program Scholarship

2016, 2017, 2018, 2019

Awarded to students in the Tsinghua Xuetao Talents Program.

COURSE PROJECTS

Should Winners Be Biased Towards: Cascades in multi-player non-cooperative games **2018**

Course: Network Science, mentored by Chenye Wu

This project aims to model a common type of multi-player competitive games. We proved that, with adequate conditions, the initial advantage will cascade and let one player dominate the game with probability tending to 1. We also defined an index called Average Struggle until Relief(ASR), and conducted experiments in which ASR is highly relevant to the unbalancedness of game settings.

Smoothly Controlled Autonomous Driving Agent **2018**

Course: Autonomous Driving, (Grade A+), mentored by Longbo Huang

In this project we developed an algorithm driving a car in a simulated environment. The highlight of the algorithm is that it achieved a smooth control when following cars and avoiding collision, by dynamically setting continuous velocity targets for lower-level control module.

LANGUAGE

Chinese: Native

English: TOEFL 108, GRE 330+4