# **Boyuan Chen**

Cambridge, MA \* Home Page: boyuan.space \* boyuanc@mit.edu

#### **EDUCATION**

Massachusetts Institute of Technology (MIT), PhD student in EECS

UC Berkeley, BA Computer Science (EECS Honor Class), Applied Math, Class of 2021, GPA 3.96

2021 - Present 2017-2021

**Selected Coursework**: Deep Unsupervised Learning(A+), Deep Reinforcement Learning(A+), Advanced Robotics(A+), Natural Language Processing(A), Machine Learning(A), Computer Vision(A), Al System(A+), Hardware for Deep Learning(A), Robotics(A+), Real Analysis(A+), Complex Analysis(A+), Algorithms(A), Data Structure(A), Computer Program(A+), Computer Architecture(A), Stochastic Process & Probability(A)

## **EXPERIENCE**

# Google DeepMind

Research Intern May 2023 - Aug 2023

- Lead the training of a multi-modal Large Language Model (MLLM) with large scale synthetic data.
- Implemented the entire data synthesis pipeline, Instruction tuning and Visual grounding.

# Google X (or X, the Moonshot Factory)

Al resident, machine learning for robotics (with return offer at Google's L4 level but declined)

May 2022 - Aug 2022

Sep 2021 - present

- Develop machine learning algorithms for sequential decision making in robotics
- Visual grounding for Large Language Model

## MIT Computer Science and Artificial Intelligence Laboratory (CSAIL)

Researcher

• Machine learning & robotics advised by Prof. Russ Tedrake and Prof. Vincent Sitzmann

## **Berkeley Artificial Intelligence Research Lab**

Researcher Jan 2019 - Aug 2021

- Computer vision research Prof. Trevor Darrell; Reinforcement learning research with Prof. Pieter Abbeel
- Student researcher on unsupervised learning, 3d vision, visual reinforcement learning and generalizable manipulation.

# Robomooc.com, Chongqing Muke Robotics Inc.

Startup Founder Nov 2017 - Mar 2020

- Company providing robotics education solution to K12 education
- Lead the software and hardware development of robot kits that we sell to student participants in robotics competitions

#### Robomaster at Berkeley (Robotics Team & Club)

Founder, Captain Oct 2018 – 2021

- Lead 20-member robotics team building autonomous shooting robots for ICRA RoboMaster AI Challenge
- Designed and implemented novel methods for data collection, object detection and inference acceleration

#### **Open Source Project Contributor**

• Contributor of DL Framework Pytorch, Torchvision; Physics Engine Bullet3; Robotics framework Drake

2018 - 2021

#### **MIT Chess club**

Executive at MIT Chess Club

2021 - present

• Team member of MIT in collegiate chess league

#### **SKILLSET**

Language & Tools: Python, C++/C, Java, PyTorch, Tensorflow, Jax, Pax, Flume, OpenCV, MongoDB, TensorRT, ZeroMQ, Qt5 Machine Learning: Deep Reinforcement Learning, Large Language Model, Data synthesis, Generative Models (Diffusion, Flow, GAN, VAE, EBM), Video Prediction, Gaussian Splatting, Variational Inference, Time Series Prediction, Imitation Learning.

# **PUBLICATION**

# Spatial VLM: Endowing Vision-Language Models with Spatial Reasoning Capabilities

B. Chen, Z. Xu, S. Kirmani, B. Ichter, D. Driess, P. Florence, D. Sadigh, L. Guibas, F. Xia

Arxiv 2024

## **DittoGym: Learning to Control Soft Shape-Shifting Robots**

**ICLR 2024** 

S. Huang, B. Chen, H. Xu, V. Sitzmann

#### Self-Supervised Reinforcement Learning that Transfers using Random Features

NeurIPS 2023

B. Chen, C. Zhu, P. Agrawal, K. Zhang, A. Gupta

**Open-vocabulary Queryable Scene Representations for Real World Planning** 

**ICRA 2023** 

Reasoning or Reciting? Exploring the Capabilities and Limitations of LLM Through Counterfactual Tasks  Z. Wu, L. Qiu, A. Ross, E. Akyürek, B. Chen, B. Wang, N. Kim, J. Andreas, Y. Kim  Extraneousness-Aware Imitation Learning  R. Zheng, K. Hu, B. Chen, H. Xu. In submission to Neurips 2023  Jusupervised 3d Keypoint Learning for control  R. Chen, D. Pathak, P. Abbeel. Accepted to ICML 2021.  Rero-shot Policy Learning with Spatial Temporal Reward Decomposition on Contingency-aware Observation  R. Chen*, H. Xu*, Y. Gao, T. Darrell. Accepted to ICRA 2021  Discovering Diverse Multi-Agent Strategic Behavior via Reward Randomization  R. Chen*, H. Xu, X. Wang, F. Fang, S. Du, Y. Wang, Y. Wu  ACADEMIC SERVICE  Reviewer of CVPR, NeurIPS, ICLR, ICRA, IROS, RAL, AAAI  Reaching Assistant, MIT 6.4210/6.4212 Robotic Manipulation  PERSONAL PROJECTS  Autonomous multi-floor food delivery robot (Control, Planning, Sensing, Vision, ROS)  RAR Robomaster Al Challenge Autonomous Combat Robot (Vision, Planning, ROS, Control, AI)  PERSONAL PROJECTS  Autonomous Multi-Terrain Rover (CAD, Manufacture, Electronics, Control, Embedded System)  Moy 2019 - Aug 2013  Autonomous Multi-Terrain Rover (CAD, Manufacture, Electronics, Computer Vision, Planning)  Autonomous Multi-Terrain Rover (CAD, Manufacture, Electronics, Computer Vision, Planning)  Autonomous Tracking Drone (Computer Vision, Embedded System)  Moy 2019 - Aug 2013  Autonomous Tracking Drone (Computer Vision, Embedded System)  Feb 2022  HONOR  Feb 2022  HONOR  Feb 2022  Processory  Processory  Processory  Reviewer of CVPR, Reviewer AI Challenge  Minner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Contest  Aug 2018  Minner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Contest  Minner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Contest  Minner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Contest  Minner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Co		
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	Winner, CS170 Efficient Algorithms Contest	Oct 2018
Honor degree in EECS. High honor in general scholarship. Dean's List. UC Berkeley 2017-2023	2 <sup>nd</sup> place, Google Puzzlehunt, second fastest prize eligible team out of 800+ teams of Google employees	Jul 2022
	Honor degree in EECS, High honor in general scholarship, Dean's List, UC Berkeley	2017-2021