Boyuan Chen

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EDUCATION

Massachusetts Institute of Technology (MIT), PhD student in EECS	*2021 - Present*
UC Berkeley, BA Computer Science (EECS Honor Class), Applied Math, Class of 2021, GPA 3.96	*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), AI System(A+), Hardware for Deep Learning(A), Robotics(A+), Real Analysis(A+), Complex Analysis(A+), Algorithms(A), Data Structure(A), Programming(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, Google's semi-secret research facility)
AI resident, machine learning for robotics (with return offer at Google's L4 level but declined)　　　*May 2022 – Aug 2022*
- 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　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　*Sep 2021 – present*
- Machine learning & robotics advised by Prof. Vincent Sitzmann and Prof. Russ Tedrake
- Research focus: world model, diffusion planning, model-based RL, foundation models for decision making, Robotics.

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 - 2023*
- 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, Generative Models (Diffusion, Flow, GAN, VAE), Variational Inference, Time Series Prediction, Planning Imitation Learning, World Model, Large Language Model, Multimodal Model, Data Synthesis.

PUBLICATION

Diffusion Forcing: Next-token Prediction Meets Full-Sequence Diffusion	**under review at NeurIPS**
B. Chen, D. Monso, Y. Du, M. Simchowitz, R. Tedrake, V. Sitzmann.	(Top 1% by score)
Spatial VLM: Endowing Vision-Language Models with Spatial Reasoning Capabilities	**CVPR 2024**
B. Chen, Z. Xu, S. Kirmani, B. Ichter, D. Driess, P. Florence, D. Sadigh, L. Guibas, F. Xia	
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**
B. Chen, F. Xia, B. Ichter, K. Rao, K. Gopalakrishnan, M. Ryoo, A. Stone, D. Kappler	

Unsupervised 3d Keypoint Learning for control   ICML 2021

B. Chen, D. Pathak, P. Abbeel.

Unifying 3D Representation and Control of Diverse Robots with a Single Camera   under review at Nature

S. Lester Li, A. Zhang, B. Chen, H. Matusik, C. Liu, D. Rus, V. Sitzmann

DittoGym: Learning to Control Soft Shape-Shifting Robots   ICLR 2024

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

Reasoning or Reciting? Exploring the Capabilities and Limitations of LLM Through Counterfactual Tasks   NAACL 2024

Z. Wu, L. Qiu, A. Ross, E. Akyürek, B. Chen, B. Wang, N. Kim, J. Andreas, Y. Kim

Extraneousness-Aware Imitation Learning   ICRA 2023

R. Zheng, K. Hu, B. Chen, H. Xu.

Zero-shot Policy Learning with Spatial Temporal Reward Decomposition on Contingency-aware Observation   ICRA 2020

B. Chen*, H. Xu*, Y. Gao, T. Darrell.

Discovering Diverse Multi-Agent Strategic Behavior via Reward Randomization   ICLR 2021

Z. Tang, C. Yu, B. Chen, H. Xu, X Wang, F. Fang, S. Du, Y. Wang, Y. Wu

ACADEMIC SERVICE

Reviewer of NeurIPS, ICLR, CVPR, ICRA, IROS, RAL, AAAI	*2021-*
Teaching Assistant, MIT 6.4210/6.4212 Robotic Manipulation	*Sep 2022 – Dec 2022*

PERSONAL PROJECTS

Autonomous multi-floor food delivery robot (Control, Planning, Sensing, Vision, ROS)	*Sep 2019 - Dec 2019*
ICRA Robomaster AI Challenge Autonomous Combat Robot (Vision, Planning, ROS, Control, AI)	*Jan 2019 - May 2019*
Personal drivable RC robot (CAD, Manufacture, Electronics, Control, Embedded System)	*May 2019 - Aug 2019*
Autonomous Multi-Terrain Rover (CAD, Manufacture, Electronics, Computer Vision, Planning)	*Oct 2017 - Aug 2018*
Autonomous Tracking Drone (Computer Vision, Embedded System)	*Sep 2016 - Aug 2017*

HONOR

Seneff-Zue CS Fellowship	*Feb 2021*
Winner, Facebook Pytorch Summer Hackathon	*Aug 2019*
Finalist, ICRA 2019 Robomaster AI Challenge	*May 2019*
Winner, Record Keeper, UC Berkeley CS 61C Neural Network Inference Optimization Contest	*Aug 2018*
Winner, CS170 Efficient Algorithms Contest	*Oct 2018*
2nd place, Google Puzzlehunt, second fastest prize eligible team out of 800+ teams of Google employees	*1*
Honor degree in EECS, High honor in general scholarship, Dean's List, UC Berkeley	*2017-2021*