

Education

- 2017/08- Present **Ph.D., Computer Science**, *University of California, Berkeley, USA*.
Advisor: Prof. Dawn Song
- 2013/09- **B.Eng., Computer Science and Technology**, *Shanghai Jiao Tong University, China*.
- 2017/06 ACM Honored Class (an elite training program of computer science in China)
GPA Ranking: **1/30**

Honors and Awards

- 2021 **Rising Stars in Machine Learning**, awarded to 3 women machine learning researchers.
- 2021 **Rising Stars in EECS**.
- 2021 **Outstanding Reviewer Award**, top 8% reviewers in NeurIPS 2021.
- 2020 **Facebook Fellowship**, awarded to 36 students worldwide, one of the two winners in Machine Learning.
- 2020 **Rising Stars in EECS**.
- 2020 **Outstanding Reviewer Award**, top 10% reviewers in NeurIPS 2020.
- 2017 **Departmental Fellowship of EECS**, UC Berkeley.
- 2017 **The Prize of Excellent Bachelor Thesis**, top 1% in Shanghai Jiao Tong University.
- 2017 **Outstanding Graduate of Shanghai Jiao Tong University**.
- 2012 **Gold Medal**, *Asia-Pacific Informatics Olympiad in China District*.
- 2012 **Silver Medal**, *Chinese Team Selection Contest*.

Research Experience

- 2021/05-08 **Research Intern (remote)**, *DeepMind, London, UK*.
Mentor: Yujia Li
Deep learning for program synthesis
- 2020/05-08 **Research Intern (remote)**, *Google Brain, Mountain View, CA, USA*.
Mentors: Denny Zhou, Rishabh Singh, Petros Maniatis, Charles Sutton
Deep learning for program synthesis
 - SpreadsheetCoder: Formula Prediction from Semi-structured Context, paper accepted by ICML 2021.
 - Our work was released to support **formula suggestions in Google Sheets** for all users.
- 2019/05-08 **Research Intern**, *Google Brain, Kirkland, WA, USA*.
Mentor: Denny Zhou
Neural-Symbolic Techniques for Natural Language Understanding
 - Neural Symbolic Reader, paper accepted by ICLR 2020 with a spotlight presentation.
 - Neural-Symbolic Stack Machines, paper accepted by NeurIPS 2020.
- 2018/05-08 **Research Intern**, *Facebook AI Research (FAIR), Menlo Park, CA, USA*.
Mentor: Yuandong Tian
Deep Reinforcement Learning for Optimization
 - Learning to Perform Local Rewriting for Combinatorial Optimization, paper accepted by NeurIPS 2019.
- 2015/10 **Visiting Student**, *National Institute of Informatics, Tokyo, Japan*.

Advisor: Prof. Helmut Prendinger

- Project: Deep learning for drone's object detection.
- My results encouraged the lab to continue this research direction, which finally led to the DRONET (Drone as Life Infrastructure) commercial project.

Conference Publications

- 2022 [1] Hui Shi, Sicun Gao, Yuandong Tian, **Xinyun Chen**, Jishen Zhao, "Learning Bounded Context-Free Grammar via LSTM and the Transformer: Difference and Explanations", *AAAI Conference on Artificial Intelligence*, 2022 (**AAAI '22**).
- 2021 [2] **Xinyun Chen**, Dawn Song, Yuandong Tian, "Latent Execution for Neural Program Synthesis", *Advances in Neural Information Processing Systems*, 2021 (**NeurIPS '21**).
- 2021 [3] **Xinyun Chen**, Petros Maniatis, Rishabh Singh, Charles Sutton, Hanjun Dai, Max Lin, Denny Zhou, "SpreadsheetCoder: Formula Prediction from Semi-structured Context", *International Conference on Machine Learning*, 2021 (**ICML'21**).
- Our work was released to support **formula suggestions in Google Sheets** for all users.
Other related links: [Google AI Blog] | [The Verge]
- 2021 [4] Hongyu Ren, Hanjun Dai, Bo Dai, **Xinyun Chen**, Michihiro Yasunaga, Haitian Sun, Dale Schuurmans, Jure Leskovec, Denny Zhou, "LEGO: Latent Execution-Guided Reasoning for Multi-Hop Question Answering on Knowledge Graphs", *International Conference on Machine Learning*, 2021 (**ICML'21**).
- 2021 [5] Cheng Fu, Hanxian Huang, **Xinyun Chen**, Yuandong Tian, Jishen Zhao, "Learn-to-Share: A Hardware-friendly Transfer Learning Framework Exploiting Computation and Parameter Sharing", *International Conference on Machine Learning*, 2021 (**ICML'21, Long Talk**).
- 2021 [6] **Xinyun Chen**, Linyuan Gong, Alvin Cheung, Dawn Song, "PlotCoder: Hierarchical Decoding for Synthesizing Visualization Code in Programmatic Context", *Annual Meeting of the Association for Computational Linguistics*, 2021 (**ACL'21**).
- 2021 [7] Yujian Gan, **Xinyun Chen**, Qiuping Huang, Matthew Purver, John R. Woodward, Jinxia Xie, Pengsheng Huang, "Towards Robustness of Text-to-SQL Models against Synonym Substitution", *Annual Meeting of the Association for Computational Linguistics*, 2021 (**ACL'21**).
- 2021 [8] **Xinyun Chen***, Wenxiao Wang*, Chris Bender, Yiming Ding, Ruoxi Jia, Bo Li, Dawn Song, "REFIT: a Unified Watermark Removal Framework for Deep Learning Systems with Limited Data", *ACM Asia Conference on Computer and Communications Security*, 2021 (**AsiaCCS'21**). (* Equal contribution)
- 2021 [9] Yujian Gan, **Xinyun Chen**, Matthew Purver, "Exploring Underexplored Limitations of Cross-Domain Text-to-SQL Generalization", *Conference on Empirical Methods in Natural Language Processing*, 2021 (**EMNLP'21**).
- 2021 [10] Yujian Gan, **Xinyun Chen**, Jinxia Xie, Matthew Purver, John R. Woodward, John Drake, Qiaofu Zhang, "Natural SQL: Making SQL Easier to Infer from Natural Language Specifications", *Findings of Conference on Empirical Methods in Natural Language Processing*, 2021 (**EMNLP Findings'21**).
- 2021 [11] Zhuolin Yang*, Zhaoxi Chen, Tiffany (Tianhui) Cai, **Xinyun Chen**, Bo Li, Yuandong Tian*, "Understanding Robustness in Teacher-Student Setting: A New Perspective", *Artificial Intelligence and Statistics*, 2021 (**AISTATS '21**). (* Equal contribution)
- 2020 [12] **Xinyun Chen**, Chen Liang, Adams Wei Yu, Dawn Song, Denny Zhou, "Compositional Generalization via Neural-Symbolic Stack Machines", *Advances in Neural Information Processing Systems*, 2020 (**NeurIPS '20**).
- 2020 [13] Kavi Gupta, Peter Ebert Christensen*, **Xinyun Chen***, Dawn Song, "Synthesize, Execute and Debug: Learning to Repair for Neural Program Synthesis", *Advances in Neural Information Processing Systems*, 2020 (**NeurIPS '20**). (* Equal contribution)
- 2020 [14] Aishan Liu, Tairan Huang, Xianglong Liu, Yitao Xu, Yuqing Ma, **Xinyun Chen**, Stephen Maybank, Dacheng Tao, "Spatiotemporal Attacks for Embodied Agents", *European Conference on Computer Vision*, 2020 (**ECCV '20**).

- 2020 [15] **Xinyun Chen**, Chen Liang, Adams Wei Yu, Denny Zhou, Dawn Song, Quoc Le, “Neural Symbolic Reader: Scalable Integration of Distributed and Symbolic Representations for Reading Comprehension”, *International Conference on Learning Representations*, 2020 (**ICLR '20, Spotlight**).
- 2020 [16] Hui Shi, Yang Zhang, **Xinyun Chen**, Yuandong Tian, Jishen Zhao, “Deep Symbolic Superoptimization Without Human Knowledge”, *International Conference on Learning Representations*, 2020 (**ICLR '20**).
- 2019 [17] **Xinyun Chen**, Yuandong Tian, “Learning to Perform Local Rewriting for Combinatorial Optimization”, *Advances in Neural Information Processing Systems*, 2019 (**NeurIPS '19**).
- 2019 [18] Cheng Fu, Huili Chen, Haolan Liu, **Xinyun Chen**, Yuandong Tian, Farinaz Koushanfar, Jishen Zhao, “Coda: An End-to-End Neural Program Decompiler”, *Advances in Neural Information Processing Systems*, 2019 (**NeurIPS '19**).
- 2019 [19] **Xinyun Chen**, Chang Liu, Dawn Song, “Execution-Guided Neural Program Synthesis”, *International Conference on Learning Representations*, 2019 (**ICLR '19**).
- 2018 [20] **Xinyun Chen**, Chang Liu, Dawn Song, “Tree-to-tree Neural Networks for Program Translation”, *Advances in Neural Information Processing Systems*, 2018 (**NeurIPS '18**).
- 2018 [21] Xiaojun Xu, **Xinyun Chen**, Chang Liu, Anna Rohrbach, Trevor Darell, Dawn Song, “Fooling Vision and Language Models Despite Localization and Attention Mechanism”, *IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2018 (**CVPR '18**).
- 2018 [22] **Xinyun Chen**, Chang Liu, Dawn Song, “Towards Synthesizing Complex Programs from Input-Output Examples”, *International Conference on Learning Representations*, 2018 (**ICLR '18**).
- 2017 [23] Yanpei Liu, **Xinyun Chen**, Chang Liu, Dawn Song, “Delving into Transferable Adversarial Examples and Black-box Attacks”, *International Conference on Learning Representations*, 2017 (**ICLR '17**).
- 2016 [24] **Xinyun Chen**, Chang Liu, Richard Shin, Dawn Song, Mingcheng Chen, “Latent Attention For If-Then Program Synthesis”, *Advances in Neural Information Processing Systems*, 2016 (**NeurIPS '16**).

Workshop Publications

- 2020 [1] Hongyu Ren, Hanjun Dai, Bo Dai, **Xinyun Chen**, Denny Zhou, Jure Leskovec, Dale Schuurmans, “Scaling up Logical Query Embeddings on Knowledge Graphs”, early version in ICML 2021 Workshop on Self-Supervised Learning for Reasoning and Perception (**Oral**).
- 2020 [2] Pratyush Maini, **Xinyun Chen**, Bo Li, Dawn Song, “Perturbation Type Categorization for Multiple l_p Bounded Adversarial Robustness”, early version in ICML 2020 Workshop on Uncertainty and Robustness in Deep Learning.
- 2017 [3] Warren He, James Wei, **Xinyun Chen**, Nicolas Carlini, Dawn Song, “Adversarial Example Defenses: Ensembles of Weak Defenses are not Strong”, in 11th USENIX Workshop on Offensive Technologies, 2017 (**WOOT '17**).
- 2016 [4] Bo Li, Yevgeniy Vorobeychik, **Xinyun Chen**, “A General Retraining Framework for Scalable Adversarial Classification”, in NeurIPS 2016 Workshop on Adversarial Training, 2016.

Preprints

- 2021 [1] Shiyu Tang, Ruihao Gong, Wang Yan, Aishan Liu, Jiakai Wang, **Xinyun Chen**, Fengwei Yu, Xianglong Liu, Dawn Song, Alan Yuille, Philip Torr, Dacheng Tao, “RobustART : Benchmarking Robustness on Architecture Design and Training Techniques”, arXiv preprint arXiv:2109.05211.
- 2020 [2] Micah Goldblum, Dimitris Tsipras, Chulin Xie, **Xinyun Chen**, Avi Schwarzschild, Dawn Song, Aleksander Madry, Bo Li, Tom Goldstein, “Dataset Security for Machine Learning: Data Poisoning, Backdoor Attacks, and Defenses”, arXiv preprint arXiv:2012.10544.
- 2017 [3] **Xinyun Chen**, Chang Liu, Bo Li, Kimberly Lu, Dawn Song, “Targeted Backdoor Attacks on Deep Learning Systems Using Data Poisoning”, arXiv preprint arXiv:1712.05526.

Media coverage: Motherboard, The Register

Talks

- 2021/12 **Learning-based Program Synthesis**, Microsoft New England Machine Learning Seminar.

University of California, Berkeley

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- 2021/12 **Learning-based Program Synthesis**, Microsoft Research Asia.
- 2021/11 **SpreadsheetCoder: Formula Prediction from Semi-structured Context**, GRID, Iceland.
- 2021/11 **Deep Learning for Program Synthesis: Towards Human-like Reasoning**, Rising Stars in Machine Learning Speaker Series, University of Maryland.
- 2021/10 **Neural Program Synthesis for Language Understanding in the Wild**, Neurosym Webinar Series.
- 2021/10 **Deep Learning for Program Synthesis: Towards Human-like Reasoning**, Stanford Software Research Lunch.
- 2021/09 **Deep Learning for Program Synthesis: Towards Human-like Reasoning**, Facebook Fellowship Summit.
- 2021/08 **Deep Learning for Program Synthesis: Towards Human-like Reasoning**, University of Southern California.
- 2021/06 **Adversarial Attacks in Computer Vision: An Overview**, CVPR Tutorial on Adversarial Machine Learning in Computer Vision.
- 2021/04 **Deep Learning for Program Synthesis**, SJSU SCE Spark Tech Conference.
- 2021/03 **Neural-Symbolic Reasoning for Language Understanding**, Keynote speech at WSDM Workshop on Machine Reasoning.
- 2020/12 **Deep Learning for Program Synthesis from Input-Output Examples**, NeurIPS Workshop on Computer-Assisted Programming.
- 2020/06 **Neural Program Synthesis for Navigation and Language Understanding**, CVPR Tutorial on Neuro-Symbolic Visual Reasoning and Program Synthesis.
- 2020/04 **Learning to Perform Local Rewriting for Combinatorial Optimization**, Google, Mountain View.
- 2020/02 **Neural-Symbolic Reader for Reading Comprehension**, Google, Mountain View.
- 2020/01 **Learning to Perform Local Rewriting in Discrete Search Spaces**, Alibaba Group, Sunnyvale.
- 2019/10 **Neural Program Synthesis from Natural Language Specification**, Open Virtual Assistant Lab, Stanford University.
- 2019/02 **Neural Program Synthesis from Input-Output Examples**, UC San Diego.
- 2018/11 **Towards Synthesizing Complex Programs from Input-Output Examples**, Guest lecture in CS294-157: Deep Learning and Program Synthesis, UC Berkeley.
- 2018/10 **Neural Program Synthesis from Input-Output Examples**, Facebook Big Code Summit.
- 2018/05 **Deep Learning for Program Synthesis**, Guest lecture in CS379C: Computational Models of the Neocortex, Stanford University.

Services

- Co-Organizer**, Workshop on Security and Safety in Machine Learning Systems (ICLR 2021).
- Co-Organizer**, Tutorial on Adversarial Machine Learning in Computer Vision (CVPR 2021).
- Co-Organizer**, Workshop on Adversarial Machine Learning in Real-world Computer Vision Systems and Online Challenges (CVPR 2021).
- Co-Organizer**, Workshop on Structured and Unstructured Knowledge Integration (NAACL 2022).
- Co-Organizer**, Workshop on Socially Responsible Machine Learning (ICML 2021).
- Co-Organizer**, Workshop on Adversarial Robustness in the Real World (ICCV 2021).
- Co-Organizer**, Workshop on Practical Deep Learning in the Wild (AAAI 2022).
- Co-Organizer**, Workshop on Adversarial Learning for Multimedia (ACM MM 2021).
- Co-Organizer**, Workshop on Adversarial Machine Learning in Computer Vision (CVPR 2020).
- Senior Program Committee**, IJCAI 2021.
- Expert Reviewer**, ICML 2021.
- Program Committee / Reviewer**, NeurIPS, ICLR, AAAI, ACL, EMNLP, NAACL, CVPR, ICCV, ECCV, TPAMI, IJCV, Artificial Intelligence, TIP, TIFS, TDSC.

- 2020-Present **Mentor**, Undergraduate AI Research Mentoring Program, UC Berkeley.
Mentor undergraduates from underrepresented groups who are considering a career in research.
- 2020/09 **Facilitator**, *London Machine Learning Meetup*.
- 2020 **Student Reviewer**, *UC Berkeley EECS Ph.D. Admissions*.
Review Ph.D. applications in Security and AI-Security.

Teaching Experience

- Fall 2021 **Advisor**, Teaming and Project Management (ENGIN 270C), UC Berkeley.
Propose the project topics for M.Eng students, design the project milestones and deliverables, mentor the students to fulfill the course requirements.
- Fall 2021 **Graduate Student Instructor**, Deep Reinforcement Learning (CS 285), UC Berkeley.
- Spring 2021 **Graduate Student Instructor**, Introduction to Artificial Intelligence (CS 188), UC Berkeley.
- Fall 2014 **Teaching Assistant**, Computer Programming (CS 122), Shanghai Jiao Tong University.

Mentoring

- Kavi Gupta**, Master student at UC Berkeley, now a Ph.D. student at MIT.
- Pratyush Maini**, Visiting undergraduate from IIT Delhi, now a Ph.D. student at Carnegie Mellon University.
- Wenxiao Wang**, Visiting undergraduate from Tsinghua University, now a Ph.D. student at University of Maryland.
- Peter Ebert Christensen**, Visiting master student from Technical University of Denmark.
- Da Shen**, Visiting master student from University of Maryland.
- Marsalis Gibson**, Ph.D. student at UC Berkeley.
- Anish Doshi**, M.Eng student at UC Berkeley.
- Wesley Cheng**, M.Eng student at UC Berkeley.
- Harry Singh**, M.Eng student at UC Berkeley.
- Chia-En Chiang**, M.Eng student at UC Berkeley.
- Chris Bender**, Undergraduate at UC Berkeley.
- Yiming Ding**, Undergraduate at UC Berkeley.
- Kimberly Lu**, Undergraduate at UC Berkeley.
- Arnav Gudibande**, Undergraduate at UC Berkeley.
- Jason Xiong**, Undergraduate at UC Berkeley.
- Nabeel Hingun**, Undergraduate at UC Berkeley.
- Maxwell Lin**, Undergraduate at UC Berkeley.
- Akshit Dewan**, Undergraduate at UC Berkeley.

Misc

- Music**: Grade 9 Certificate of Piano, Grade 10 Certificate of Music Theory