Kevin Lu

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Education

Aug 2021 – Aug 2018 **University of California, Berkeley**
Bachelor of Science (BS) in Electrical Engineering and Computer Sciences (EECS)

Experience

Present – Aug 2023 **Startup**
AI Researcher
I am currently training deep learning models on various problems.

Aug 2023 – Aug 2022 **Hudson River Trading AI Labs**
Algorithm Developer
Applied deep learning research for high-frequency trading at scale (about 5-10% of US equities trades).

Mar 2022 – Aug 2021 **Facebook AI Research**
AI Resident
Research on better generalization in sequence modeling for reinforcement learning. I worked on extending Decision Transformer to larger-scale multi-task learning settings.

Aug 2021 – Jun 2019 **Robot Learning Lab @ UC Berkeley**
Undergraduate Researcher (Advisors: Igor Mordatch, Pieter Abbeel)
Research on reinforcement learning and sequence modeling: see Highlighted Publications below. I was interested in models which leveraged large-scale pretraining data. I gave a talk on my research here.

Highlighted Publications

Jun 2021 **Decision Transformer: Reinforcement Learning via Sequence Modeling**
L. Chen* and K. Lu* (equal contribution), ..., P. Abbeel, A. Srinivas†, I. Mordatch†
Summary: simple sequence modeling can do offline RL, matching traditional dynamic programming (temporal difference learning) methods on recent benchmarks.

Presented at Neural Information Processing Systems (NeurIPS) 2021. Covered by: The Batch, The Gradient, SyncedReview, Yannic Kilcher, HuggingFace. Transformers and supervised learning approaches are now used for a wide variety of sequential decision-making tasks [1, 2, 3, 4, 5, 6, 7, 8].

Mar 2021 **Pretrained Transformers as Universal Computation Engines**
K. Lu, A. Grover, P. Abbeel, I. Mordatch
Summary: pretrained language sequence models can exhibit cross-modal transfer to distinct non-language modalities, improving performance on random initialization.

Presented at the AAAI Conference on Artificial Intelligence 2022 as an oral presentation. Covered by: The Batch, VentureBeat, Yannic Kilcher. Language models now serve as a base model/interface for many multimodal models (GPT-4, PALM-E, RT-2).

Teaching (UC Berkeley)

May 2021 – Jan 2019 **EECS 126 Course Staff: Probability and Random Processes**
Head Teaching Assistant for EECS 126 (Sp21, Fa20)
Teaching Assistant for EECS 126 (Sp20, Fa19)
Reader for CS 70 (Sp19)
EECS 126 is Berkeley's upperclassman probability course. I was responsible for organizing course, managing staff, creating content, and communicating with students. Wrote a course study guide.

All Publications

Dec 2021 **Pretraining for Language-Conditioned Imitation with Transformers**
A. Putterman, K. Lu, I. Mordatch, P. Abbeel.
NeurIPS Offline Reinforcement Learning Workshop, 2021.
Summary: unsupervised sequence pretraining improves language-conditioned behavior policies.

Oct 2021 **URLB: Unsupervised Reinforcement Learning Benchmark**
M. Laskin* and D. Yarats*, H. Liu, K. Lee, A. Zhan, K. Lu, C. Cang, L. Pinto, P. Abbeel.
Neural Information Processing Systems (NeurIPS), 2021.
Summary: we benchmark unsupervised RL algorithms on downstream finetuning performance.

Jun 2021 **Decision Transformer: Reinforcement Learning via Sequence Modeling**
L. Chen*, K. Lu*, A. Rajeswaran, K. Lee, A. Grover, M. Laskin, P. Abbeel, A. Srinivas†, I. Mordatch†.
Neural Information Processing Systems (NeurIPS), 2021.
Summary: simple sequence modeling can do offline RL, matching traditional dynamic programming.

Mar 2021 **Pretrained Transformers as Universal Computation Engines**
K. Lu, A. Grover, P. Abbeel, I. Mordatch.
AAAI Conference on Artificial Intelligence (Oral Presentation), 2022.
Summary: pretrained language models can exhibit cross-modal transfer to non-language modalities.

Jan 2021 **Efficient Empowerment Estimation for Unsupervised Stabilization**
R. Zhao, K. Lu, P. Abbeel, S. Tiomkin.
International Conference on Learning Representations (ICLR), 2021.
Summary: new unbiased empowerment estimator improving stability over variational methods.

Dec 2020 **Reset-Free Lifelong Learning with Skill-Space Planning**
K. Lu, A. Grover, P. Abbeel, I. Mordatch.
International Conference on Learning Representations (ICLR), 2021.
Summary: model-based planning over a space of model-free skills improves reset-free performance.

Dec 2019 **Adaptive Online Planning for Continual Lifelong Learning**
K. Lu, I. Mordatch, P. Abbeel.
NeurIPS Deep Reinforcement Learning Workshop, 2019.
Summary: model-based planning outperforms model-free acting in dangerous reset-free settings.

Invited Talks

Jun 2022 CLEAR Ventures: "Advances in Robotic and Reinforcement Learning Research"

Jan 2022 Adept AI: "Towards a Universal Paradigm for Decision Making"

Jan 2022 Google: "Pretrained Transformers as Universal Computation Engines"

Jan 2022 Facebook AI Research: "Towards a Universal Paradigm for Decision Making"

Jul 2021 Intel AI Labs: "Decision Transformer: Reinforcement Learning via Sequence Modeling"

Jul 2021 Eindhoven RL: "Decision Transformer: Reinforcement Learning via Sequence Modeling"

Apr 2021 IBM: "Pretrained Transformers as Universal Computation Engines"

Apr 2021 Facebook AI Research: "Pretrained Transformers as Universal Computation Engines"

Apr 2021 Berkeley Vision Group: "Pretrained Transformers as Universal Computation Engines"

Mar 2021 Cohere AI: "Pretrained Transformers as Universal Computation Engines"

Coursework and Activities

Undergraduate Coursework:

GPA: EECS 4.00/4.00; Overall 3.95/4.00

Graduate-level courses: Unsupervised Learning (CS 294-158), Natural Language Processing (CS 288), Advanced Robotics (CS 287), Theory of Bandits & Reinforcement Learning (EE 290), Population Games (EE 290), Robust and Nonparametric Statistics (Stat 240), Theoretical Statistics (Stat 210A)

Undergraduate-level courses: Machine Learning (CS 189), Artificial Intelligence (CS 188), Convex Optimization (EECS 127), Probability and Random Processes (EECS 126), Efficient Algorithms (CS 170), Discrete Math (CS 70), Machine Structures (CS 61C), Mathematical Economics (Econ C103), Biological Psychology (Psych 110)

Conference Reviewer:

Neural Information Processing Systems (NeurIPS)
International Conference on Learning Representations (ICLR)
International Conference on Machine Learning (ICML)