Siddharth Verma

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About Me

I am an ML Engineer with deep expertise in NLP and Reinforcement Learning. I have trained LLMs of various sizes and deployed them to production serving millions of users. I have also performed ML research in both academic and industrial settings, resulting in multiple papers published in venues such as NeurIPS and ACL.

Technologies: Pytorch, Pytorch Lightning, JAX, Docker, NixOS, Unix/Bash, Git, Google Cloud, AWS
Skills: NLP, Reinforcement Learning, Multimodal Learning, Machine Learning, Neural Networks, Statistics
Languages: Python, Haskell, Rust, Java, C, Go, PureScript, RISC-V, SQL

Experience

Senior Machine Learning Engineer

Square Boston MA Sep 2022–Current

- Finetuned open-source LLMs on merchant-buyer conversations to suggest replies to incoming messages
- Conducted an online A/B test and demonstrated a 5% increase in suggestion acceptance rate
- Designed and implemented a multi-task training system to incorporate classification tasks into an LLM
- Instruction finetuned FLAN-T5 on internal data and evaluated performance against individual classifiers

AI Resident

Meta (Facebook) Seattle WA Aug 2021–Sep 2022

- Wrote code to process 1TB of multimodal data using Rust and Parquet for a 20x speedup against Python
- Automated the training LLMs of up to 13B parameters on large multi-node clusters with up to 64GPUs
- Evaluated whether training on explanations improve reasoning capabilities of LLMs, and found that explanations mostly benefit mathematical reasoning
- Analyzed effect of masking rates and masking strategies in multimodal learning, showing that increasing masking rate nullifies effects of different masking strategies

Machine Learning Intern

Apple Seattle WA Jun 2021–Aug 2021

- Implemented Transformer architecture from primitive operations for an in-house deep learning framework
- Demonstrated correctness by replicating English-German translation results from 'Attention Is All You Need'
- Optimized self-attention for Apple Neural Engine by rewriting computation with supported operations

Undergraduate Researcher at Robotic AI and Learning Lab

Berkeley Artificial Intelligence Research Lab Berkeley CA Jan 2019–May 2021

- Worked with Prof. Sergey Levine and Prof. Chelsea Finn on RL and NLP in domains of robotics and chatbots
- Designed and implemented a multi-agent RL algorithm to learn composable locomotive skills without manual environment resets, subsequently using them to solve a maze. Published at NeurIPS
- Used Offline RL to finetune LLMs to bargain on craigslist items, beating supervised learning in human evals across all metrics. Accepted as oral presentation at NAACL

Education

UC Berkeley 2017–2021

BA Computer Science & Music *GPA 3.965/4.0*

Publications

K. Xu*, **S. Verma***, C. Finn, S. Levine (2020). *Continual Learning of Control Primitives: Skill Discovery via Reset-Games*. Published in NeurIPS 2020

S. Verma, J. Fu, M. Yang, S. Levine (2022). *CHAI: A Chatbot AI for Task-oriented Dialog with Offline Reinforcement Learning*. Published in NAACL 2022

S. Verma, Y. Lu, R. Hou, H. Yu, N. Ballas, M. Khabsa, A. Almahairi (2022). *Uniform Masking Prevails in Vision-Language Pretraining*. Preprint

P. Yu, T. Wang, O. Golovneva, B. AlKhamissi, **S. Verma**, G. Ghosh, M. Diab, A. Celikyilmaz (2022). *ALERT: Adapting Language Models to Reasoning Tasks*. Published in ACL 2023

B. AlKhamissi, **S. Verma**, P. Yu, M. Diab, A. Celikyilmaz (2023). *OPT-R: Enhacing Reasoning Capabilities of Large Language Models*. Published in ACL Natural Language Reasoning and Structured Explanations workshop 2023