

# 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.

**Skills:** NLP, Reinforcement Learning, Multimodal Learning, Machine Learning, Neural Networks, Statistics

**Technologies:** Pytorch, Pytorch Lightning, JAX, Docker, NixOS, Unix/Bash, Git, Google Cloud, AWS

**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: Enhancing Reasoning Capabilities of Large Language Models*. Published in ACL Natural Language Reasoning and Structured Explanations workshop 2023