Siddharth Karamcheti

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Education

2019 – Now
GPA 4.01
Ph.D. in Computer Science at Stanford University, Stanford, CA.
- Co-advised by Percy Liang and Dorsa Sadigh
- Supported by the *Open Philanthropy AI Fellowship* (5+ years of support)
- Focus areas: *human-robot interaction, natural language processing, robotics*

2015 – 2018
GPA 3.95
Sc.B in Computer Science. A.B. in Literary Arts at Brown University, Providence, RI.
- Graduated *magna cum laude with honors in computer science*
- Thesis: Grounding natural language to goals for abstraction, generalization, and interpretability
- Co-advised by Eugene Charniak and Stefanie Tellex

2014 – 2015
GPA 3.92
Electrical Engineering & Computer Science, UC Berkeley, Berkeley, CA.
- Awarded the *Regents and Chancellor's Scholarship* (top 2% of incoming class)
- Transferred to Brown after first year to pursue interdisciplinary education in CS + Literature

Research Experience

2019 – Now
Stanford University, *Stanford, CA.*
Ph.D. Student co-advised by Percy Liang and Dorsa Sadigh
Conducting research in shared autonomy and language for robotic manipulation, self-supervised learning, with additional interests in multi-modality, language grounding, and interaction.

2021 – 2022
Hugging Face, *Remote – Palo Alto, CA.*
Research Intern in Multimodality and Scaling
Affiliated with the core Science team, as well as the open-source engineering team.
Conducted research in large-scale multimodal (text, vision, video, audio) modeling, with a goal of learning powerful contextual representations.

2018 – 2019
Facebook AI Research, *New York, NY.*
AI Resident; Advised by Rob Fergus, Douwe Kiela, Jason Weston, and Arthur Szlam
Conducted research at the intersection of deep reinforcement learning and natural language processing; additional work in text-based games.

2017 – 2018
Bloomberg LP – CTO Research Group, *New York, NY.*
Research Intern (Summer '17, '18, Part-Time '17-'18); Advised by Gideon Mann and David Rosenberg
Conducted research in automated bug detection ("fuzzing") using machine learning, active learning.

2016 – 2018
Human to Robots (H2R) Lab – Brown University, *Providence, RI.*
Undergraduate Research Assistant; Advised by Stefanie Tellex.
Conducted research in human-robot interaction: instruction following for mobile manipulation.

2016 – 2018
Brown Lab for Linguistic Information Processing (BLLIP), *Providence, RI.*
Undergraduate Research Assistant; Advised by Eugene Charniak.
Research in computational social science, semantic parsing, and question-answering.

Honors and Awards

2022 Best Paper Finalist for "What Makes Representation Learning from Videos Hard for Control?" at the 2nd Workshop on Scaling Robot Learning at RSS 2022.

2022 Highlighted Reviewer at ICLR 2022.

2021 Outstanding Reviewer Award at EMNLP.

2021 Outstanding Paper award at ACL-IJCNLP for "Mind Your Outliers! Investigating the Negative Impact of Outliers on Active Learning for Visual Question Answering." Awarded to the top 5 (0.2%) out of 3000+ submissions.

2021 Outstanding Reviewer Award at ACL-IJCNLP.

2019 Open Philanthropy Project AI Fellowship, offering full funding for 5+ years of the PhD, and access to broader network of fellows and affiliated research scientists.

2018 Selected for the inaugural Facebook AI Residency, 1/11 out of 2000+ applications.

2018 University Distinguished Thesis Nominee, Brown Computer Science. Sole CS-department nominee for University-wide undergraduate thesis prize.

2018 Honorable Mention – Computing Research Association (CRA) Outstanding Undergraduate Researcher Prize. One of 45 student recognized in nationwide competition.

2018 Senior Prize, Brown University Computer Science Department. Recognized for outstanding record in research, teaching, and service.

2017 Best Paper Award at RoboNLP Workshop @ ACL 2017 for "A Tale of Two DRAGGNs: Interpreting Action and Goal-Oriented Instructions."

2014 Regents and Chancellor's Scholarship – UC Berkeley. One of 200 incoming undergraduates recognized with the scholarship, as determined by the Academic Senate.

Peer-Reviewed Academic Publications

CoRL 2022 **Eliciting Compatible Demonstrations for Multi-Human Imitation Learning**.
Kanishk Gandhi, **Siddharth Karamcheti**, Madeline Liao, Dorsa Sadigh
Conference on Robot Learning (CoRL) 2022

SRL 2022 **What Makes Representation Learning from Videos Hard for Control?**.
Tony Z. Zhao, **Siddharth Karamcheti**, Thomas Kollar, Chelsea Finn, Percy Liang
2nd Workshop on Scaling Robot Learning (SRL) @ RSS, 2022
Best Paper Finalist

NL-Sup 2022 **Shared Autonomy for Robotic Manipulation with Language Corrections**.
Siddharth Karamcheti, Raj Palleti, Yuchen Cui, Percy Liang, Dorsa Sadigh
Workshop on Learning with Natural Language Supervision (NL-Sup) @ ACL, 2022

NeurIPS 2021 **ELLA: Exploration through Learned Language Abstraction**.
Suvir Mirchandani, **Siddharth Karamcheti**, Dorsa Sadigh
Advances in Neural Information Processing Systems (NeurIPS), 2021

CoRL 2021 **LILA: Language-Informed Latent Actions**.
Siddharth Karamcheti*, Megha Srivastava*, Percy Liang, Dorsa Sadigh
Conference on Robot Learning (CoRL), 2021

ACL 2021 **Mind Your Outliers! Investigating the Negative Impact of Outliers on Active Learning for Visual Question Answering**.
Siddharth Karamcheti, Ranjay Krishna, Li Fei-Fei, Christopher D. Manning
Annual Meeting of the Association of Computational Linguistics (ACL-IJCNLP), 2021
Outstanding Paper Award (top 5 / 3000+ submissions) | Main Stage Presentation

ICML 2021 **Targeted Data Acquisition for Evolving Negotiation Agents**.
Minae Kwon, **Siddharth Karamcheti**, Mariano-Florentino Cuéllar, Dorsa Sadigh
International Conference on Machine Learning (ICML), 2021

L4DC 2021 **Learning Visually Guided Latent Actions for Assistive Teleoperation**.
Siddharth Karamcheti, Albert J. Zhai, Dylan P. Losey, Dorsa Sadigh
Learning for Dynamics and Control (L4DC), 2021

IntEx-SemPar 2020 **Learning Adaptive Language Interfaces through Decomposition**.
Siddharth Karamcheti, Dorsa Sadigh, Percy Liang
Workshop for Interactive and Executable Semantic Parsing (IntEx-SemPar) @ EMNLP, 2020

AAAI 2020 **Generating Interactive Worlds with Text**.
Angela Fan*, Jack Urbanek*, Pratik Ringshia, Emily Dinan, Emma Qian, **Siddharth Karamcheti**, Shrimai Prabhumoye, Douwe Kiela, Tim Rocktäshel, Arthur Szlam, Jason Weston
Association for the Advancement of Artificial Intelligence (AAAI), 2020

EMNLP 2019 **Finding Generalizable Evidence by Learning to Convince Q&A Models**.
Ethan Perez, **Siddharth Karamcheti**, Rob Fergus, Jason Weston, Douwe Kiela, Kyunghyun Cho
Empirical Methods in Natural Language Processing (EMNLP), 2019

Learning to Speak and Act in a Fantasy Text Adventure Game.
Jack Urbanek, Angela Fan, **Siddharth Karamcheti**, Saachi Jain, Samuel Humeau, Emily Dinan, Tim Rocktäshel, Douwe Kiela, Arthur Szlam, Jason Weston
Empirical Methods in Natural Language Processing (EMNLP), 2019

ML4SE 2019 **Improving Grey-Box Fuzzing by Modeling Program Control Flow**.
Siddharth Karamcheti, Gideon Mann, David Rosenberg
Workshop on Machine Learning for Software Engineering (ML4SE), 2019

AuRO 2019 **Grounding Natural Language Instructions to Semantic Goal Representations for Abstraction and Generalization**.
Dilip Arumugam*, **Siddharth Karamcheti***, Nakul Gopalan, Edward C. Williams, Mina Rhee, Lawson L.S. Wong, Stefanie Tellex
Journal – Autonomous Robots (AuRO), 2019

AISEC 2018 **Adaptive Grey-Box Fuzz Testing with Thompson Sampling**.
Siddharth Karamcheti, Gideon Mann, David Rosenberg
ACM Workshop on Artificial Intelligence and Security (AISEC), 2018
Oral Presentation

RoboNLP 2017 **A Tale of Two DRAGGNs: Interpreting Action and Goal-Oriented Instructions**.
Siddharth Karamcheti, Edward C. Williams, Dilip Arumugam, Mina Rhee, Nakul Gopalan, Lawson L.S. Wong, Stefanie Tellex
Workshop in Language Grounding for Robotics (RoboNLP) @ ACL, 2017
Best Paper Award | Oral Presentation

RSS 2017 **Accurately and Efficiently Interpreting Instructions of Varying Granularities**.
Dilip Arumugam*, **Siddharth Karamcheti***, Nakul Gopalan, Lawson L.S. Wong, Stefanie Tellex
Robotics: Science and Systems (RSS), 2017

Manuscripts, Blog Posts & Non-Archival Publications

Annotated S4 **The Annotated S4 – Structured State Space Models for Sequence Modeling**.
Sasha Rush and **Siddharth Karamcheti** – *ICLR Blog Track, 2022*
A literate implementation and associated blog post for the Structured State Spaces for Sequence Modeling (S4) architecture, with analysis of long-range generalization capabilities.
Blog || Library || ICLR Blog Reviews

Mistral **Mistral: A Journey towards Reproducible Language Model Training**.
Siddharth Karamcheti* and Laurel Orr*
Codebase & associated writeup detailing our journey in scaling large-scale language model pre-training as part of the development team for the Center for Research on Foundation Models.
Blog || Code & Checkpoints

Foundation Models **On the Opportunities & Risks of Foundation Models**.
Center for Research on Foundation Models, led by Percy Liang. Authored the following sections:
- *Robotics*: **Siddharth Karamcheti** (lead author), Annie Chen, Suvir Mirchandani, Suraj Nair, Krishnan Srinivasan, Kyle Hsu, Jeannette Bohg, Dorsa Sadigh, Chelsea Finn
- *Interaction*: Joon Sung Park, Chris Donahue, Mina Lee, **Siddharth Karamcheti**, Dorsa Sadigh, Michael Bernstein

Undergraduate Thesis **Grounding Language to Goals for Abstraction, Generalization and Interpretability**.
Siddharth Karamcheti – Submitted for fulfillment of Sc. B. Honors in Computer Science
Nominated for University-level honors (sole CS Department nominee)

Engineering Experience

2016 **Wealthfront Inc.**, *Redwood City, CA*.
Software Engineering Intern
Backend software intern primarily working on data workflows, risk services.

2015 **WriteLab Inc.**, *Berkeley, CA*.
Natural Language Processing Intern
NLP engineering intern, built systems for topic and entity tracking across large-scale documents (essays & academic papers), as well as topic dependencies.

2013 **Autogrid Systems**, *Redwood City, CA*.
Software Engineering Intern
Helped build out in-house development and testing infrastructure, transitioned to machine learning, feeding data to generalized machine learning models to predict energy demand spikes.

Teaching Experience

Autumn 2022 **Head Course Assistant for Stanford CS 221: Introduction to Artificial Intelligence**.
Co-taught by Percy Liang and Dorsa Sadigh; Managing a staff of 14 TAs to design assignments, hold weekly sections, write exams, supervise final projects for an enrollment of 400+ students.

2017-2018 **Head Teaching Assistant for Brown CS 1380: Distributed Systems**.
Taught by Theophilius Benson; Managed a staff of 5 TAs to design assignments, grade, and hold additional tutorial sections and office hours. Built new projects on block-chains & cryptocurrencies.

2016-2017, 2017-2018 **Head Teaching Assistant for Brown CS 2950K/1470: Deep Learning**.
Taught by Eugene Charniak; 2016-2017 was first offering of the class, led a group of 2 other TAs in designing and implementing all projects in Tensorflow 0.4, pulling from topics across NLP, Vision, and Reinforcement Learning. 2017-2018 class grew in size, led a team of 12+ TAs.

2016-2017 **Head Teaching Assistant for Brown CS 1460: Computational Linguistics**.
Taught by Eugene Charniak; rewrote assignments in language modeling, machine translation, parsing, topic modeling, and deep learning for representation learning, managing a team of 7 TAs.

Professional Activities

Leadership

2020 – 2022 Lead (w/ Laurel Orr) the development, or "propulsion" team for the Center of Research on Foundation Models (CRFM), advised by Percy Liang

Workshop & Symposia Organization

2022 Co-organizer for the **"Workshop on Foundation Models for Decision Making (FMDM)"** at *NeurIPS*, with Sherry Yang (UC Berkeley), Yilun Du (MIT), Jack Parker-Holder (DeepMind), Igor Mordatch (Google), Shane Gu (University of Tokyo, Google), and Ofir Nachum (Google).

2022 Lead organizer for the **"Workshop on Learning from Diverse, Offline Data (L-DOD)"** at *Robotics: Science and Systems*, with Suraj Nair (Stanford), Dhruv Shah (UC Berkeley), Victoria Dean (CMU), and Professors Percy Liang (Stanford), Chelsea Finn (Stanford), and Dorsa Sadigh (Stanford).

2021 Co-organizer for the **"Bay Area Robotics Symposium (BARS)"** with Professors Dorsa Sadigh (Stanford), Mark Mueller (UC Berkeley), and fellow student Erdem Biyik (Stanford).

Journal & Conference Reviewer

NLP
- ACL Rolling Review (ARR): October 2021- (Monthly)
- Association for Computational Linguistics (ACL): 2020-
- Empirical Methods in Natural Language Processing (EMNLP): 2020-
- North American Association for Computation Linguistics (NAACL): 2020-

Robotics
- Robotics & Automation – Letters (RA-L): 2020-
- Conference on Robot Learning (CoRL): 2021-
- International Conference on Robotics & Automation (ICRA): 2020-
- International Conference on Intelligent Robots & Systems (IROS): 2021-
- ACM/IEEE Conference on Human-Robot Interaction (HRI): 2022-

ML
- Conference on Neural Information Processing Systems (NeurIPS): 2021-
- International Conference on Learning Representations (ICLR): 2021-
- International Conference on Machine Learning (ICML): 2021-

Workshop Reviewer

Robotics & RL
- Workshop on Foundation Models for Decision Making (FMDM) @ NeurIPS: 2022
- Workshop on Learning from Diverse, Offline Data (L-DOD) @ RSS: 2022
- Workshop on Deep Reinforcement Learning @ NeurIPS: 2021-
- Robot Learning: Self-Supervised & Lifelong Learning @ NeurIPS: 2021-
- Social Intelligence in Humans and Robotics @ ICRA: 2021-

NLP
- Learning with Natural Language Supervision (NL-Sup) @ ACL: 2022
- Interactive Learning for Natural Language Processing (InterNLP) @ ACL: 2021-
- Visually Grounded Interaction and Language (ViGiL) @ NAACL: 2021-
- Novel Ideas in Learning to Learn from Interaction (NILLI) @ EMNLP: 2021
- Insights from Negative Results in NLP (Insights) @ EMNLP: 2021
- Spatial Language and Grounding for Robotics (Splu-RoboNLP) @ ACL: 2021

ML
- Interactive Machine Learning Workshop (IML) @ AAAI: 2022
- Controllable Generation (CtrlGen) @ NeurIPS: 2021

University Service

2020 – 2022 Editor for the Stanford Artificial Intelligence Blog; responsible editing student-authored posts and managing the blog website.

2019 – 2021 Organized Grounding & Interaction Reading/Research group bringing together students and faculty from NLP, CV, RL, Robotics, and beyond to discuss and present recent work.

2020 – 2021 Reviewed Ph.D. applications for Stanford's Computer Science department as part of the Applications Committee.