Kate Sanders

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Education

Johns Hopkins University — **Final year** Ph.D. student
Ph.D. in Computer Science | Advisor: Benjamin Van Durme — *Baltimore, MD*

Johns Hopkins University — 2021 – 2023
M.S.E. in Computer Science (GPA: 3.9/4.0) | Advisor: Benjamin Van Durme — *Baltimore, MD*

UC Berkeley — 2017 – 2020
B.A. in Computer Science (GPA: 3.9/4.0) | Advisor: Ken Goldberg — *Berkeley, CA*

Research Statement

I am looking for a research role in industry that centers reasoning systems and NLP. I am particularly interested in multimodality (image and video), AI for science, evaluation, factuality, and retrieval.

Current Projects

Autonomous Scientific Feasibility Assessment

- Building tool-calling and multi-agent debate pipelines to analyze feasibility of claims in materials science.

Detecting Disinformation with LLMs

- Training lightweight LLMs to detect deceptive language in complex natural language documents.

Research Experience

Amazon Web Services — May 2025 – Oct. 2025
Applied Scientist Intern — *NYC, New York*

- Researched automatic generation of domain-specific RL rewards for reasoning (paper under review).
- Used algorithms like SFT & GRPO to train models for technical tasks (math, coding, etc.).
- Mentored by Nathaniel Weir.

Human Language Technology Center of Excellence — June 2024 – Aug. 2024
Program Co-Lead — *Baltimore, MD*

- Co-organized and ran the 40+ participant, 10-week SCALE 2024 Summer Research Workshop.
- First author of the research paper serving as the workshop basis [17].
- Led six-researcher team working on fine-tuning and evaluating multimodal fusion models.
- Workshop produced multiple research papers ([8], [9], [6], [5], [14]) and an ACL 2025 shared task.

Center for Language and Speech Processing, Johns Hopkins University — Aug. 2021 – Present
Ph.D. Researcher — *Baltimore, MD*

- Researching transparent reasoning ([1], [2], [12], [13], [10]), multimodal understanding and retrieval ([3], [15], [17], [18]), and model evaluation ([7], [11], [16]).

AUTOLab, UC Berkeley Artificial Intelligence Research — Sept. 2018 – May 2021
Undergraduate Researcher — *Berkeley, CA*

- Led robot error recovery research and improved system efficiency by 107% [23].
- Trained LSTMs for time series modeling [20] and co-designed a shelf-searching algorithm [19].
- Collaborated to design and deploy web app for computing robot grasp quality [24].

The Miller Lab, UC Berkeley Molecular & Cell Biology — Jan. 2018 – May 2018
Research Assistant — *Berkeley, CA*

- Developed statistical modeling software in MATLAB for neuronal analysis research ([21], [22]).

Teaching

Artificial Agents (Lecturer) — Fall 2024
Johns Hopkins University | *CS 601.470* | *Instructor: Prof. Benjamin Van Durme* — *Baltimore, MD*
- Co-wrote syllabus and gave lectures on current AI agent research.
- Advised 14 student teams on their final research projects.

Introduction to Machine Learning (Head TA) — Fall 2020
UC Berkeley | *CS 189/289A* | *Instructor: Prof. Anant Sahai* — *Berkeley, CA*
- Led staff of 20+ machine learning TAs and tutors.
- Received the UC Berkeley Outstanding Graduate Student Instructor Award.
- Designed and implemented novel course structures for online teaching.

Adaptive Instruction Methods in Computer Science — Spring 2020
UC Berkeley | *CS 370* | *Instructor: Christopher Hunn* — *Berkeley, CA*
- Trained 60+ UC Berkeley EECS TAs and tutors.
- Ran peer tutoring for UC Berkeley's lower-division EECS classes.
- Implemented and maintained tutor-student matching software using Ruby on Rails.
- Co-developed syllabus, assignments, and exams.

Structure and Interpretation of Computer Programs — Spring 2019
UC Berkeley | *CS 61A* | *Instructor: Prof. Dan Garcia* — *Berkeley, CA*
- Taught discussion and lab sections, hosted office hours, and proctored exams.

Presentations

Grounding Partially-Defined Events in Multimodal Data — Nov. 2024
Workshop on the Future of Event Detection, EMNLP 2024 — *Talk*

Takeaways from the SCALE 2024 Workshop on Video-based Event Retrieval — Sept. 2024
Center for Language and Speech Processing Seminar — *Talk*

A Survey of Video Datasets for Grounded Event Understanding — June 2024
3rd Visual Datasets Understanding Workshop, CVPR 2024 — *Talk*

Multimodal Entailment Trees for Neuro-Symbolic Video Reasoning — May 2024
11th Mid-Atlantic Student Colloquium on Speech, Language and Learning — *Poster*

Visual Event Semantics — Oct. 2023
Center for Language and Speech Processing Seminar — *Talk*

Service

ACL Workshop Organizer (MAGMaR 2025 & 2026) — 2025 – Present
- Co-organizer for the 2025 & 2026 ACL workshops on multimodal RAG.

CLSP Admissions Committee — 2023 – Present
- Member of the hiring committee for reviewing Johns Hopkins CS Ph.D. applications.

Peer Reviewing
- ICLR 2026, EMNLP 2025, COLM 2025, ACL 2025*, CVPR 2025*, EMNLP 2024, NAACL 2024, NeurIPS 2023, Instruction Workshop @ NeurIPS 2023, NeurIPS 2022, IROS 2021, CASE 2020*[1]

[1] *Secondary reviewer

Preprints

Google Scholar ID: VJFrfM0AAAAJ

[1] **Sanders, K.**, Van Durme, B. Bonsai: Interpretable Tree-Adaptive Grounded Reasoning. 2025 arXiv preprint.

[2] Gupta, K., **Sanders, K.**, Solar-Lezama, A. Randomly Sampled Language Reasoning Problems Elucidate Limitations of In-Context Learning. 2025 arXiv preprint.

[3] Martin, A., Kriz, R., Walden, W., **Sanders, K.**, Recknor H., Yang, E., Ferraro, F., Van Durme, B. WikiVideo: Article Generation from Multiple Videos. 2025 arXiv preprint.

[4] Deo, A., **Sanders, K.**, Van Durme, B. SocialNLI: A Dialogue-Centric Social Inference Dataset. 2025 arXiv preprint.

Publications

[5] Kriz, R.*, **Sanders, K.***, Etter, D., Murray, M., Carpenter, C., Recknor, H., Blasco, J., Martin, A., Yang, E., Van Durme, B. MultiVENT 2.0: A Massive Multilingual Benchmark for Event-Centric Video Retrieval. **CVPR 2025**.

[6] Reddy, A., Martin, A., Yang, E., Yates, A., **Sanders, K.**, Murray, K., Kriz, R., M de Melo, C., Van Durme, B., Chellappa, R. Video-ColBERT: Contextualized Late Interaction for Text-to-Video Retrieval. **CVPR 2025**.

[7] Ou, J.*, Walden, W.*, **Sanders, K.**, Jiang, Z., Sun, K., Cheng, J., ..., Van Durme, B. CLAIMCHECK: How Grounded are LLM Critiques of Scientific Papers? **EMNLP 2025 Findings**.

[8] DeGenaro, D., Yang, E., Etter, D., Carpenter, C., **Sanders, K.**, ..., Kriz, R. FORTIFY: Generative Model Fine-tuning with ORPO for ReTrieval Expansion of InFormal NoisY Text. **ACL 2025 Workshops**.

[9] Samuel, S., DeGenaro, D., Guallar-Blasco, J., **Sanders, K.**, Eisape, O., ..., Kriz, R. MMMORRF: Multimodal Multilingual MOdularized Reciprocal Rank Fusion. **SIGIR 2025 Demo**.

[10] Xu, K., Kordi, Y., Nayak, T., Asija, A., Wang, Y., **Sanders, K.**, Byerly, A., Zhang, J., Van Durme, B., Khashabi, D. Tur[k]ingBench: A Challenge Benchmark for Web Agents. **NAACL 2025**.

[11] Jiang, Z., Zhang, J., Weir, N., Ebner, S., Wanner, M., **Sanders, K.**, Khashabi, D., Liu, A., Van Durme, B. (2024). Core: Robust Factual Precision Scoring with Informative Sub-Claim Identification. **ACL 2025 Findings**.

[12] **Sanders, K.**, Weir, N., Van Durme, B. TV-TREES: Multimodal Entailment Trees for Neuro-Symbolic Video Reasoning. **EMNLP 2024**.

[13] Weir, N., **Sanders, K.**, Weller, O., Sharma, S., Jiang, D., Jiang, Z., ..., Van Durme, B. Enhancing Systematic Decompositional Natural Language Inference Using Informal Logic. **EMNLP 2024**.

[14] **Sanders, K.***, Kriz, R.*, Etter, D.*, Recknor, H., Martin, A., Carpenter, C., Lin, J., Van Durme, B. Grounding Partially-Defined Events in Multimodal Data. **EMNLP 2024 Findings**.

[15] **Sanders, K.**, Van Durme, B. (2024). A Survey of Video Datasets for Grounded Event Understanding. **CVPR 2024 Workshops**.

[16] Mayfield, J., Yang, E., Lawrie, D., MacAvaney, S., McNamee, P., Oard, D. W., ..., **Sanders, K.**, Mason, M., Hibbler, N. On the Evaluation of Machine-Generated Reports. **SIGIR 2024**.

[17] **Sanders, K.***, Etter, D.*, Kriz, R.*, Van Durme, B. MultiVENT: Multilingual Videos of Events with Aligned Natural Text. **NeurIPS 2023 D&B**.

[18] **Sanders, K.**, Kriz, R., Liu, A., Van Durme, B. Ambiguous Images With Human Judgments for Robust Visual Event Classification. **NeurIPS 2022 D&B**.

[19] Huang, H.*, Dominguez-Kuhne, M.*, Ichnowski, J., Danielczuk, M., Satish, V., **Sanders, K.**, M., Lee, A., Angelova, A., Vanhoucke, V., Goldberg, K. Mechanical Search on Shelves using Lateral Access X-RAY. **IROS 2021**.

[20] Huh, T. M., **Sanders, K.**, Danielczuk, M., Li, M., Chen, Y., Goldberg, K., Stuart, H. S. A Multi-Chamber Smart Suction Cup for Adaptive Gripping and Haptic Exploration. **IROS 2021**.

[21] Walker, A., Raliski, B., Nguyen, D., Zhang, P., **Sanders, K.**, Karbasi, K., Miller, E. Imaging Voltage in Complete Neuronal Networks Within Patterned Microislands Reveals Preferential Wiring of Excitatory Hippocampal Neurons. **Frontiers in Neuroscience 2021**.

[22] Walker, A., Raliski, B., Karbasi, K., Zhang, P., **Sanders, K.**, Miller, E. Optical Spike Detection and Connectivity Analysis With a Far-Red Voltage-Sensitive Fluorophore Reveals Changes to Network Connectivity in Development and Disease. **Frontiers in Neuroscience 2021**.

[23] **Sanders, K.**, Danielczuk, M., Mahler, J., Tanwani, A., Goldberg, K. Non-Markov Policies to Reduce Sequential Failures in Robot Bin Picking. **CASE 2020**.

[24] Song, J., Tanwani, A., Ichnowski, J., Danielczuk, M., **Sanders, K.**, Chui, J., Aparicio Ojea, J., Goldberg, K. Robust Task-Directed Grasp Planning as a Service. **CASE 2020**.