

# Nikhil Krishnaswamy

<https://www.nikhilkrishnaswamy.com>

<https://www.signallab.ai>

## Areas of Specialization

Artificial Intelligence; Computational Linguistics/Natural Language Processing; Machine Learning; Human-Computer Interaction; Simulation; Computer Graphics; Spatial Cognition and Reasoning.

## Appointments Held

- 2020-present *Assistant Professor of Computer Science*, Colorado State University, Fort Collins, CO, USA
- 2017-2020 *Postdoctoral Associate*, Brandeis University, Waltham, MA, USA

## Education

- 2017 PhD in Computer Science, Brandeis University, Waltham, MA, USA  
Advisor: *Prof. James Pustejovsky*. Committee: *Prof. Kenneth D. Forbus, Prof. Timothy J. Hickey, Dr. Marc Verbagen*.
- 2013 MA in Computational Linguistics, Brandeis University, Waltham, MA, USA
- 2010 BS in Computer Games Development, DePaul University, Chicago, IL, USA

## Doctoral Thesis

- 2017 Krishnaswamy, N. (2017). *Monte-Carlo Simulation Generation Through Operationalization of Spatial Primitives*. PhD thesis, Brandeis University.  
• Created VoxSim semantic event simulator and VoxML visual modeling language (now under development as an ISO standard).

## 1 Research

### Research Funding

- 2024-2025 [R6] Defense Advanced Research Projects Agency Information Innovation Office: Transparency, Reflection, and Accountability in Conversational Exchanges (Friction and Accountability in Conversational Transactions AI Exploration). Award #HR00112490377. Awarded \$978,331. PI, multi-institution award, CSU lead.
- 2023-2026 [R5] National Science Foundation Division of Information & Intelligent Systems: Research on Emerging Technologies for Teaching and Learning: An AI Tutoring System for Pollinator Conservation Community Science Training. Award #IIS 2303019. Awarded

\$849,890. Co-PI.

- 2023  
[R4] Army Research Office Short Term Innovative Research: Embodied Computational Metacognition (Knowledge Systems Program). Award #W911NF-23-1-0031. Awarded \$60,000. PI.
- 2020-  
2025  
[R3] National Science Foundation Division of Research on Learning: AI Institute: Institute for Student-AI Teaming (Term as co-PI: 2022-2026). Award #DRL 2019805. Awarded \$632,644. CSU PI, multi-institution award, CSU non-lead.
- 2020-  
2022  
[R2] National Science Foundation Division of Information & Intelligent Systems: NSF2026: EAGER: A Playground and Proposal for Growing an AGI. Award #CNS 1033932. Awarded \$12,000. Consultant.
- 2018-  
2022  
[R1] Defense Advanced Research Projects Agency Information Innovation Office: Representations of Vectors and Abstract Meanings for Information Synthesis (Active Interpretation of Disparate Alternatives Program) (Term as co-PI: 2022). Award #FA8750-18-2-0016. Awarded \$436,178. CSU PI, multi-institution award, CSU non-lead.

### Honors & Awards

Where applicable, the publication or presentation receiving the award is cross-referenced following the award listing.

- 2022  
[A4] Best paper, International Conference on Human-Computer Interaction (HCII). *Multimodal Semantics for Affordances and Actions*. **[C22]**
- [A3] Best interactive event, International Conference on Artificial Intelligence in Education (AIED). *iSAT speech-based AI display for small group collaboration in classrooms*. **[P2]**
- 2020  
[A2] Best demo, International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE). *Situational Awareness in Human Computer Interaction: Diana's World*. **[C16]**
- 2019  
[A1] Outstanding reviewer, Conference on Empirical Methods in Natural Language Processing and International Joint Conference on Natural Language Processing (EMNLP-IJCNLP).

### Invited Talks

- 2023  
[T7] Krishnaswamy, N. (2023). What We're (Not) Talking About When We Talk About AI. Colorado State University University Science Club.
- [T6] Krishnaswamy, N. (2023). Reasoning About Anomalous Object Interaction Using Plan Failure as a Metacognitive Trigger. ARO Workshop on Metacognitive Prediction of AI Behavior.
- [T5] Krishnaswamy, N. (2023). Embodiment, Metacognition, and Causality: What Will It Take to Go Beyond LLMs? Army Research Lab Natural Language Processing Round Table.
- [T4] Krishnaswamy, N. (2023). Exploiting Information Equivalence and Interchangeability between ML Representation Spaces. Rensselaer Polytechnic Institute Cognitive Sci-

ence Seminar.

- 2021  
[T3] Krishnaswamy, N. (2021). Situated Grounding and Natural Language for Embodied AI. University of Colorado Boulder Machine Learning Seminar.
- 2018  
[T2] Krishnaswamy, N. (2018). Grounded Linguistic Interaction in Multimodal Environments. Colorado State University Computer Vision Seminar.
- 2015  
[T1] Krishnaswamy, N. (2015). Inside the Language Technology Revolution. San Juan College Technology Leadership Conference.

### Prior Research Experience

- 2017-  
2020 *Postdoctoral Associate*, Brandeis University, Waltham, MA, USA
- DARPA-funded research and development in natural language understanding, artificial intelligence, and human-computer interaction.
  - Project manager for lab work on DARPA Communicating With Computers (CwC) program, including grant and monthly report writing, running evaluations, packaging software and deliverables, and managing student research assistants and collaborators across multiple sites.
- 2013-  
2017 *Graduate Research Fellow*, Brandeis University, Waltham, MA, USA

### Peer-Reviewed Publications

In the below list, \* indicates authors who are/were students of mine, † indicates authors who are/were mentees of mine outside of a formal advising relationship, ‡ indicates where I am the primary author on a publication, and § indicates where I am the senior author on a publication. = indicates equally-contributing authors. Acceptance rates for conferences and workshops and impact factors for journals are given where available. These numbers may reflect the rate for the specific instance listed or an average over previous years. Acceptance rates for *strongly refereed* conferences (those with an acceptance rate <40%), have been bolded. Any awards won by the publication are cross-referenced following the citation (see Section “Honors & Awards.”)

### **Journal Articles**

- 2024  
[J6] \*Khebour, I., Brutti, R., Dey, I., †Sikes, K., Lai, K., \*Bradford, M., \*Cates, B., \*Hansen, P., †Jung, C., †Wisniewski, B., †Terpstra, C., Hirshfield, L. M., Puntambekar, S., Blanchard, N., Pustejovsky, J., and §Krishnaswamy, N. (2024). When Text and Speech Are Not Enough: A Multimodal Dataset of Collaboration in a Situated Task. *Journal of Open Humanities Data*. DOI: <https://doi.org/10.5334/johd.168>
- 2023  
[J5] †Henlein, A., \*Gopinath, A., Krishnaswamy, N., Mehler, A., and Pustejovsky, J. (2023). Grounding Human-Object Interaction to Affordance Behavior in Multimodal Datasets. *Frontiers in Artificial Intelligence: Section Language and Computation*, 6. **Impact factor: 4.0** DOI: <https://doi.org/10.3389/frai.2023.1084740>
- [J4] =Oved, I., =Krishnaswamy, N., =Pustejovsky, J., and =Hartshorne, J. K. (2023). Neither neural networks nor the language-of-thought alone make a complete game (In response

to: The best game in town: The reemergence of the language-of-thought hypothesis across the cognitive sciences). *Behavioral and Brain Sciences*, 46. **[Impact factor: 21.4]** DOI: <https://doi.org/10.1017/S0140525X23001954>

2022  
[J3] †Krishnaswamy, N. and Pustejovsky, J. (2022). Affordance Embeddings for Situated Language Understanding. *Frontiers in Artificial Intelligence: Section Language and Computation*, 5. **[Impact factor: 4.0]** DOI: <https://doi.org/10.3389/frai.2022.774752>

2021  
[J2] Pustejovsky, J. and Krishnaswamy, N. (2021). Embodied Human Computer Interaction. *KI - Künstliche Intelligenz: Special Issue on NLP and Semantics*, 35(3):307-327. **[Impact factor: 1.8]** DOI: <https://doi.org/10.1007/s13218-021-00727-5>

[J1] Pustejovsky, J. and Krishnaswamy, N. (2021). Situated Meaning in Multimodal Dialogue: Human-Robot and Human-Computer Interactions. *Traitement Automatique des Langues: Special Issue on Dialog and Dialog Systems*, 61(3):17-41.

### Book Chapters

2018  
[B2] †Krishnaswamy, N. and Pustejovsky, J. (2018). Deictic Adaptation in a Virtual Environment. In *Spatial Cognition XI: International Conference on Spatial Cognition*. Springer. [Acceptance rate: 50%]

2016  
[B1] †Krishnaswamy, N. and Pustejovsky, J. (2016). Multimodal Semantic Simulations of Linguistically Underspecified Motion Events. In *Spatial Cognition X: International Conference on Spatial Cognition*. Springer. [Acceptance rate: 55%]

### Magazine Articles

2024  
[M1] D’Mello, S. K., =Biddy, Q., =Breideband, T., =Bush, J., =Chang, M., =Cortez, A., =Flanigan, J., =Foltz, P. W., =Gorman, J. C., =Hirshfield, L. M., =Ko, M., =Krishnaswamy, N., =Lieber, R., =Martin, J. H., =Palmer, M., =Penuel, W. R., =Philip, T., =Puntambekar, S., =Pustejovsky, J., =Reitman, J. G., =Sumner, T., =Tissenbaum, M., =Walker, M., and =Whitehill, J. (2024). From learning optimization to learner flourishing: Reimagining AI in Education at the Institute for Student-AI Teaming (iSAT). In *AI Magazine*. Wiley. DOI: <https://doi.org/10.1002/aaai.12158>

### Refereed Conference Proceedings

2024  
[C47] \*Nath, A., \*Manafi, S., \*Chelle, A., and §Krishnaswamy, N. (2024). Okay, Let’s Do This! Modeling Event Coreference with Generated Rationales and Knowledge Distillation. In *North American Chapter of the Association for Computational Linguistics (NAACL)*. ACL. **[Acceptance rate: 23%]** (Accepted for publication).

[C46] Oved, I., Krishnaswamy, N., Pustejovsky, J., and Hartshorne, J. K. (2024). Computational Thought Experiments for a More Rigorous Philosophy and Science of the Mind. In *Annual Meeting of the Cognitive Science Society (CogSci)*. Cognitive Science Society. **[Acceptance rate: 19%]** (Accepted for publication).

[C45] \*Nath, A., †Jamil, H., †Ahmed, S. R., Baker, G., \*Ghosh, R., Martin, J. H., Blanchard, N.,

- and §Krishnaswamy, N. (2024). Multimodal Cross-Document Event Coreference Resolution Using Linear Semantic Transfer and Mixed-Modality Ensembles. In *Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING)*. ACL. [Acceptance rate: 44%] (Accepted for publication).
- [C44] \*Khebour, I., Lai, K., \*Bradford, M., Zhu, Y., Brutti, R., Tam, C., Tu, J., \*Ibarra, B., Blanchard, N., Krishnaswamy, N., and Pustejovsky, J. (2024). Common Ground Tracking in Multimodal Dialogue. In *Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING)*. ACL. [Acceptance rate: 44%] (Accepted for publication).
- [C43] \*Manafi, S. and §Krishnaswamy, N. (2024). Cross-Lingual Transfer Robustness to Lower-Resource Languages on Adversarial Datasets. In *Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING)*. ACL. [Acceptance rate: 44%] (Accepted for publication).
- [C42] \*Venkatesha, V., \*Nath, A., \*Khebour, I., \*Chelle, A., \*Bradford, M., Tu, J., Pustejovsky, J., Blanchard, N., and §Krishnaswamy, N. (2024). Propositional Extraction from Natural Speech in Small Group Collaborative Tasks. In *International Conference on Educational Data Mining (EDM)*. International EDM Society. (Accepted for publication).
- [C41] \*VanderHoeven, H., \*Bradford, M., †Jung, C., \*Khebour, I., Lai, K., Pustejovsky, J., Krishnaswamy, N., and Blanchard, N. (2024). Multimodal Design for Interactive Collaborative Problem-Solving Support. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]** (Accepted for publication).
- [C40] Zhu, Y., \*VanderHoeven, H., Lai, K., \*Bradford, M., Tam, C., \*Khebour, I., Brutti, R., Krishnaswamy, N., and Pustejovsky, J. (2024). Modeling Theory of Mind in Multimodal HCI. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]** (Accepted for publication).
- [C39] \*VanderHoeven, H., Blanchard, N., and §Krishnaswamy, N. (2024). Point Target Detection for Multimodal Communication. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]** (Accepted for publication).
- [C38] †Seefried, E., \*Bradford, M., Aich, S., Siebert, C., Krishnaswamy, N., and Blanchard, N. (2024). Learning Foreign Language Vocabulary Through Task-Based Virtual Reality Immersion. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]** (Accepted for publication).
- [C37] \*Ghaffari, S. and §Krishnaswamy, N. (2024). Exploring Failure Cases in Multimodal Reasoning About Physical Dynamics. In *AAAI Spring Symposium: Empowering Machine Learning and Large Language Models with Domain and Commonsense Knowledge (MAKE)*. AAAI.
- [C36] \*Mannan, S., Vimal, V. P., DiZio, P., and §Krishnaswamy, N. (2024). Embodying Human-Like Modes of Balance Control Through Human-in-the-Loop Dyadic Learning. In *AAAI Spring Symposium: Symposium on Human-Like Learning (HLL)*. AAAI.
- 2023  
[C34] \*Nath, A., \*Mannan, S., and §Krishnaswamy, N. (2023). AxomiyaBERTa: A Phonologically-aware Transformer Model for Assamese. In *Findings of the Association for Computational Linguistics (Findings of ACL)*. ACL. **[Acceptance rate: 18%]**

- [C33] †Ahmed, S. R., \*Nath, A., Martin, J. H., and §Krishnaswamy, N. (2023).  $2^n$  is better than  $n^2$ : Decomposing Event Coreference Resolution into Two Tractable Problems. In *Findings of the Association for Computational Linguistics (Findings of ACL)*. ACL. **[Acceptance rate: 18%]**
- [C32] \*=Bradford, M., \*=Khebour, I., Blanchard, N., and §Krishnaswamy, N. (2023). Automatic Detection of Collaborative States in Small Groups Using Multimodal Features. In *International Conference on Artificial Intelligence in Education (AIED)*. International AIED Society. **[Acceptance rate: 21%]**
- [C31] \*VanderHoeven, H., Blanchard, N., and §Krishnaswamy, N. (2023). Robust Motion Recognition using Gesture Phase Annotation. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]**
- [C30] †Kandoi, C., †Jung, C., \*=Mannan, S., \*VanderHoeven, H., †Meisman, Q., Krishnaswamy, N., and Blanchard, N. (2023). Intentional Microgesture Recognition for Extended Human-Computer Interaction. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]**
- [C29] \*Ghaffari, S. and §Krishnaswamy, N. (2023). Grounding and Distinguishing Conceptual Vocabulary Through Similarity Learning in Embodied Simulations. In *International Conference on Computational Semantics (IWCS)*. ACL. [Acceptance rate: 60%]
- [C28] =Nirenburg, S., =Krishnaswamy, N., and =McShane, M. (2023). Hybrid Machine Learning/Knowledge Base Systems Learning through Natural Language Dialog with Deep Learning Models. In *AAAI Spring Symposium: Challenges Requiring the Combination of Machine Learning and Knowledge Engineering (MAKE)*. AAAI.
- 2022  
[C27] \*=Nath, A., †Mahdipour Saravani, S., \*Khebour, I., \*Mannan, S., †Li, Z., and §Krishnaswamy, N. (2022). A Generalized Method for Automated Multilingual Loanword Detection. In *International Conference on Computational Linguistics (COLING)*. ACL. **[Acceptance rate: 33%]**
- [C26] \*Mannan, S. and §Krishnaswamy, N. (2022). Where am I and where should I go? Grounding positional and directional labels in a disoriented human balancing task. In *Conference on (Dis)embodiment*. ACL.
- [C25] †Krishnaswamy, N., †Pickard, W., \*Cates, B., Blanchard, N., and Pustejovsky, J. (2022). The VoxWorld Platform for Multimodal Embodied Agents. In *International Conference on Language Resources and Evaluation (LREC)*. ACL. [Acceptance rate: 61%]
- [C24] \*Ghaffari, S. and §Krishnaswamy, N. (2022). Detecting and Accommodating Novel Types and Concepts in an Embodied Simulation Environment. In *Annual Conference on Advances in Cognitive Systems (ACS)*. Cognitive Systems Foundation.
- [C23] \*Bradford, M., \*Hansen, P., Beveridge, R., Krishnaswamy, N., and Blanchard, N. (2022). A deep dive into microphones for recording collaborative group work. In *International Conference on Educational Data Mining (EDM)*. International EDM Society.
- [C22] Pustejovsky, J. and Krishnaswamy, N. (2022). Multimodal Semantics for Affordances and Actions. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%] [A4]**
- 2021  
[C21] Pustejovsky, J. and Krishnaswamy, N. (2021). The Role of Embodiment and Simula-

- tion in Evaluating HCI: Theory and Framework. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]**
- [C20] ‡Krishnaswamy, N. and Pustejovsky, J. (2021). The Role of Embodiment and Simulation in Evaluating HCI: Experiments and Evaluation. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]**
- 2020  
[C19] ‡Krishnaswamy, N. and Pustejovsky, J. (2020). Neurosymbolic AI for Situated Language Understanding. In *Annual Conference on Advances in Cognitive Systems (ACS)*. Cognitive Systems Foundation. [Acceptance rate: 41%]
- [C18] ‡Krishnaswamy, N. and Pustejovsky, J. (2020). A Formal Analysis of Multimodal Referring Expressions Under Common Ground. In *International Conference on Language Resources and Evaluation (LREC)*. ACL. [Acceptance rate: 60%]
- [C17] ‡Krishnaswamy, N., Narayana, P., Bangar, R., Rim, K., Patil, D., McNeely-White, D. G., Ruiz, J., Draper, B., Beveridge, R., and Pustejovsky, J. (2020). Diana’s World: A Situated Multimodal Interactive Agent. In *AAAI Conference on Artificial Intelligence (AAAI): Demos Program*. AAAI.
- [C16] ‡Krishnaswamy, N., Beveridge, R., Pustejovsky, J., Patil, D., McNeely-White, D. G., Wang, H., and Ortega, F. R. (2020). Situational Awareness in Human Computer Interaction: Diana’s World. In *International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE): Demos*. ACM/Eurographics. **[A2]**
- [C15] Pustejovsky, J. and Krishnaswamy, N. (2020). Embodied Human-Computer Interactions through Situated Grounding. In *International Conference on Intelligent Virtual Agents (IVA)*. ACM. **[Acceptance rate: 26%]**
- [C14] †Hutchens, M., Krishnaswamy, N., Cochran, B., and Pustejovsky, J. (2020). Jarvis: A Multimodal Visualization Tool for Bioinformatic Data. In *International Conference on Human-Computer Interaction (HCII)*. Springer. **[Avg. acceptance rate: 29%]**
- [C13] †Krajovic, K., Krishnaswamy, N., Dimick, N. J., Salas, R. P., and Pustejovsky, J. (2020). Situated Multimodal Control of a Mobile Robot: Navigation through a Virtual Environment. In *Special Session on Situated Dialogue with Virtual Agents and Robots (RoboDIAL): Late-Breaking Papers*. Non-archival.
- 2019  
[C12] ‡Krishnaswamy, N., Friedman, S., and Pustejovsky, J. (2019). Combining Deep Learning and Qualitative Spatial Reasoning to Learn Complex Structures from Sparse Examples with Noise. In *AAAI Conference on Artificial Intelligence (AAAI)*. AAAI. **[Acceptance rate: 16%]**
- [C11] ‡Krishnaswamy, N. and Pustejovsky, J. (2019). Generating a Novel Dataset of Multimodal Referring Expressions. In *International Conference on Computational Semantics (IWCS)*. ACL. [Acceptance rate: 43%]
- [C10] McNeely-White, D., Ortega, F., Beveridge, R., Draper, B., Bangar, R., Patil, D., Pustejovsky, J., Krishnaswamy, N., Rim, K., Ruiz, J., and Wang, I. (2019). User-Aware Shared Perception for Embodied Agents. In *International Conference on Humanized Computing and Communication (HCC)*. IEEE.
- 2018  
[C9] Narayana, P., Krishnaswamy, N., Wang, I., Bangar, R., Patil, D., Mulay, G., Rim, K.,

- Beveridge, R., Ruiz, J., Pustejovsky, J., and Draper, B. (2018). Cooperating with Avatars Through Gesture, Language and Action. In *Intelligent Systems Conference (IntelliSys)*. IEEE. **[Acceptance rate: 34%]**
- [C8] †Krishnaswamy, N. and Pustejovsky, J. (2018). An Evaluation Framework for Multimodal Interaction. In *International Conference on Language Resources and Evaluation (LREC)*. ACL. [Acceptance rate: 65%]
- [C7] Do, T., Krishnaswamy, N., Rim, K., and Pustejovsky, J. (2018). Multimodal Interactive Learning of Primitive Actions. In *AAAI Fall Symposium: Artificial Intelligence for Human-Robot Interaction*. AAAI.
- [C6] Do, T., Krishnaswamy, N., and Pustejovsky, J. (2018). Teaching Virtual Agents to Perform Complex Spatial-Temporal Activities. In *AAAI Spring Symposium: Integrating Representation, Reasoning, Learning, and Execution for Goal Directed Autonomy*. AAAI.
- 2017  
[C5] †Krishnaswamy, N., Narayana, P., Wang, I., Rim, K., Bangar, R., Patil, D., Mulay, G., Ruiz, J., Beveridge, R., Draper, B., and Pustejovsky, J. (2017). Communicating and Acting: Understanding Gesture in Simulation Semantics. In *International Conference on Computational Semantics (IWCS)*. ACL. [Acceptance rate: 53%]
- [C4] Pustejovsky, J., Krishnaswamy, N., and Do, T. (2017). Object Embodiment in a Multimodal Simulation. In *AAAI Spring Symposium: Interactive Multisensory Object Perception for Embodied Agents*. AAAI.
- 2016  
[C3] †Krishnaswamy, N. and Pustejovsky, J. (2016). VoxSim: A Visual Platform for Modeling Motion Language. In *International Conference on Computational Linguistics (COLING): Technical Papers*. ACL. **[Acceptance rate: 32%]**
- [C2] Pustejovsky, J. and Krishnaswamy, N. (2016). Visualizing Events: Simulating Meaning in Language. In *Annual Meeting of the Cognitive Science Society (CogSci)*. Cognitive Science Society.
- [C1] Pustejovsky, J. and Krishnaswamy, N. (2016). VoxML: A Visualization Modeling Language. In *International Conference on Language Resources and Evaluation (LREC)*. ACL. [Acceptance rate: 60%]

### Refereed Workshop Proceedings

- 2023  
[W22] †Ahmed, S. R., \*Nath, A., Regan, M., Pollins, A., Krishnaswamy, N., and Martin, J. H. (2023). How Good is the Model in Model-in-the-loop Event Coreference Resolution Annotation? In *Linguistic Annotation Workshop (LAW)*. ACL.
- [W21] Lee, K., Krishnaswamy, N., and Pustejovsky, J. (2023). An Abstract Specification of VoxML as an Annotation Language. In *International Workshop on Semantic Annotation (ISA)*. ACL.
- [W20] †Terpstra, C., \*Khebour, I., \*Bradford, M., †Wisniewski, B., Krishnaswamy, N., and Blanchard, N. (2023). How Good is Automatic Segmentation as a Multimodal Discourse Annotation Aid? In *International Workshop on Semantic Annotation (ISA)*. ACL.
- [W19] \*Alalyani, N. and §Krishnaswamy, N. (2023). A Methodology for Evaluating Multimodal Referring Expression Generation for Embodied Virtual Agents. In *Workshop on Generation and Evaluation of Non-Verbal Behaviour for Embodied Agents (GENEA)*. ACM.



- [W18] Dey, I., Puntambekar, S., Li, R., Gengler, D., Dickler, R., Hirshfield, L. M., Clevenger, C., Rose, S., \*Bradford, M., and Krishnaswamy, N. (2023). The NICE framework: Analyzing Students’ Nonverbal Interactions During Collaborative Learning. In *Interactive Workshop: Collaboration Analytics*. Society for Learning Analytics Research.
- 2022  
[W17] \*Nath, A., †Ghosh, R., and §Krishnaswamy, N. (2022). Phonetic, Semantic, and Articulatory Features in Assamese-Bengali Cognate Detection. In *Workshop on NLP for Similar Languages, Varieties, and Dialects (VarDial)*. ACL. [Acceptance rate: 54%]
- [W16] \*Tomar, A. and §Krishnaswamy, N. (2022). Exploring Correspondences Between Gibsonian and Telic Affordances for Object Grasping. In *Workshop on Annotation, Recognition and Evaluation of Actions (AREA)*. ACL.
- [W15] \*Bradford, M., †Hansen, P., Lai, K., Brutti, R., Dickler, R., Hirshfield, L. M., Pustejovsky, J., Blanchard, N., and §Krishnaswamy, N. (2022). Challenges and Opportunities in Annotating a Multimodal Collaborative Problem Solving Task. In *Interdisciplinary Approaches to Getting AI Experts and Education Stakeholders Talking Workshop (Bridging AIEd)*. International AIEd Society.
- [W14] †Castillon, I., †Venkatesha, V., \*VanderHoeven, H., \*Bradford, M., Krishnaswamy, N., and Blanchard, N. (2022). Multimodal Features for Group Dynamic-Aware Agents. In *Interdisciplinary Approaches to Getting AI Experts and Education Stakeholders Talking Workshop (Bridging AIEd)*. International AIEd Society.
- 2021  
[W13] †Krishnaswamy, N. and \*Alalyani, N. (2021). Embodied Multimodal Agents to Bridge the Understanding Gap. In *Workshop on Bridging Human-Computer Interaction and Natural Language Processing (HCI+NLP)*. ACL.
- 2020  
[W12] Pustejovsky, J., Krishnaswamy, N., Beveridge, R., Ortega, F. R., Patil, D., Wang, H., and McNeely-White, D. G. (2020). Interpreting and Generating Gestures with Embodied Human-Computer Interactions. In *Workshop on Generation and Evaluation of Non-Verbal Behaviour for Embodied Agents (GENEA)*. ACM.
- 2019  
[W11] †Krishnaswamy, N. and Pustejovsky, J. (2019). Situated Grounding Facilitates Multimodal Concept Learning for AI. In *Visually Grounded Interaction and Language Workshop (ViGIL)*. Neural Information Processing Systems Foundation.
- [W10] †Krishnaswamy, N. and Pustejovsky, J. (2019). Multimodal Continuation-style Architectures for Human-Robot Interaction. In *Workshop on Cognitive Vision: Integrated Vision and AI for Embodied Perception and Interaction*. Cognitive Systems Foundation.
- [W9] Pustejovsky, J. and Krishnaswamy, N. (2019). Situational Grounding within Multimodal Simulations. In *AAAI Workshop on Games and Simulations in AI (GameSim)*. AAAI.
- 2018  
[W8] †Krishnaswamy, N., Do, T., and Pustejovsky, J. (2018). Learning Actions from Events Using Agent Motions. In *Workshop on Annotation, Recognition and Evaluation of Actions (AREA)*. ACL.
- [W7] Pustejovsky, J. and Krishnaswamy, N. (2018). The Role of Event Simulation in Spatial Cognition. In *Workshop on Models and Representations in Spatial Cognition (MRSC)*. Springer.
- [W6] Pustejovsky, J. and Krishnaswamy, N. (2018). Every Object Tells a Story. In *Workshop on Events and Stories in the News (EventStory)*. ACL.

- 2017  
[W5] ‡Krishnaswamy, N. and Pustejovsky, J. (2017). Do You See What I See? Effects of POV on Spatial Relation Specifications. In *International Workshop on Qualitative Reasoning (QR)*. AAAI/International Joint Conferences on Artificial Intelligence.
- [W4] Pustejovsky, J., Krishnaswamy, N., Draper, B., Narayana, P., and Bangar, R. (2017). Creating Common Ground Through Multimodal Simulations. In *Workshop on Foundations of Situated and Multimodal Communication (FSMC)*. ACL.
- 2016  
[W3] Pustejovsky, J., Krishnaswamy, N., Do, T., and Kehat, G. (2016). The Development of Multimodal Lexical Resources. In *Workshop on Grammar and the Lexicon (GramLex)*. ACL.
- [W2] Do, T., Krishnaswamy, N., and Pustejovsky, J. (2016). ECAT: Event Capture Annotation Tool. In *International Workshop on Semantic Annotation (ISA)*. ACL.
- 2014  
[W1] Pustejovsky, J. and Krishnaswamy, N. (2014). Generating Simulations of Motion Events from Verbal Descriptions. In *Lexical and Computational Semantics (\*SEM)*. ACL.

### Refereed Conference Presentations

Refereed conference submissions accepted for presentation with no accompanying proceedings, or with a published abstract only.

- 2024  
[P7] Li, T., Jing, M., Makhani, Z., Oved, I., Krishnaswamy, N., Pustejovsky, J., and Hartshorne, J. K. (2024). Computational Thought Experiments for a More Rigorous Philosophy and Science of the Mind. In *Poster presented at Annual Meeting of the Cognitive Science Society (CogSci)*. Cognitive Science Society.
- 2023  
[P6] DiZio, P., Krishnaswamy, N., \*Mannan, S., and \*Hansen, P. (2023). Manual balancing of a visual inverted pendulum by quantized versus proportional joystick commands. In *Poster presented at Neuroscience*. Society for Neuroscience.
- [P5] =Krishnaswamy, N., =Oved, I., =Hartshorne, J. K., and =Pustejovsky, J. (2023). Meaning to Mean: A Precondition for Sentience and Understanding in Large Language Models. In *The Science of Consciousness (TSC)*. Center for Consciousness Studies.
- [P4] Oved, I., Montemayor, C., Krishnaswamy, N., Pustejovsky, J., and Hartshorne, J. K. (2023). The View from Outside the Matrix: Doing Philosophy of Mind and Cognitive Science with Virtual Worlds. In *The Science of Consciousness (TSC)*. Center for Consciousness Studies.
- [P3] Weatherley, J., Dickler, R., Foltz, P. W., Srinivas, A., Pugh, S., Krishnaswamy, N., Whitehill, J., Bodzianowski, M., Perkoff, M., Southwell, R., Bush, J., Chang, M., Hirshfield, L. M., Showers, D., Ganesh, A., Li, Z., †Danilyuk, E., He, X., \*Khebour, I., Dey, I., and D’Mello, S. K. (2023). The iSAT Collaboration Analytics Pipeline. In *International Learning Analytics and Knowledge Conference (LAK)*. Society for Learning Analytics Research.
- 2022  
[P2] Dickler, R., Foltz, P. W., Krishnaswamy, N., Whitehill, J., Weatherly, J., Bodzianowski, M., Perkoff, M., Southwell, R., Pugh, S., Bush, J., Chang, M., Hirshfield, L. M., Showers, D., Ganesh, A., Li, Z., †Danilyuk, E., He, X., \*Khebour, I., Dey, I., Puntambekar, S., and D’Mello, S. K. (2022). iSAT speech-based AI display for small group collaboration in classrooms. In *Interactive event at International Conference on Artificial Intelligence*

*in Education (AIED)*. International AIED Society. **[A3]**

[P1] ‡Krishnaswamy, N. and \*Ghaffari, S. (2022). Exploiting Embodied Simulation to Detect Novel Object Classes Through Interaction. In *Poster presented at Annual Meeting of the Cognitive Science Society (CogSci)*. Cognitive Science Society.

## 2 Teaching

### Teaching Experience

Term	Course	Enrollment	Audience
Spring 2024	CS445: Introduction to Machine Learning	85 (67 in-person, 18 online)	Undergraduate
Fall 2023	CS542: Natural Language Processing	31 (24 in-person, 7 online)	Graduate
Spring 2023	CS445: Introduction to Machine Learning	83 (58 in-person, 25 online)	Undergraduate
Fall 2022	CS542: Natural Language Processing	34 (17 in-person, 17 online)	Graduate
Spring 2022	CS445: Introduction to Machine Learning	86 (75 in-person, 11 online)	Undergraduate
Fall 2021	CS542: Natural Language Processing	30 (22 in-person, 8 online)	Graduate
Spring 2021	CS445: Introduction to Machine Learning	67 (55 in-person, 12 online)*	Undergraduate

\*In Spring 2021, CS445 was taught all online due to the COVID-19 global pandemic. These numbers reflect enrollment in the officially-designated in-person (001) vs. online (801) sections.

### Other Teaching Activities

2022 Instructor, Grounding Meaning Representation for Situated Reasoning. Tutorial, Meeting of the Asia-Pacific Chapter of the Association for Computational Linguistics and International Joint Conference on Natural Language Processing (AAACL-IJCNLP). Taipei, ROC. November, 2022.

Instructor, Multimodal Semantics for Affordances and Actions. European Summer School in Logic, Language, and Information (ESSLLI). Galway, Ireland. August, 2022.

2018-  
2020 Staff tutor, Computational Linguistics Master's program. Brandeis University.  
• Tutored MS students in depth on coursework in multiple courses, including COSI 114: Fundamentals of Computational Linguistics, and COSI 134: Statistical Approaches to Natural Language Processing.

2017 Instructor, Building Multimodal Simulations for Natural Language. Tutorial, Meeting of the European Chapter of the Association for Computational Linguistics (EACL). Valencia, Spain. April, 2017.

### 3 Advising/Supervision

#### Graduated Ph.D. Students

2022  
[D1] Co-advisor. Patil, D. K. (2022). *Something is fishy!—How ambiguous language affects generalization of video action recognition networks*. PhD thesis, Colorado State University.

#### Graduated M.S.. Students

2023  
[M9] Advisor. Tomar, A. (2023). *Exploring Correspondences Between Gibsonian and Telic Affordances for Object Grasping using 3D Geometry*. Master’s thesis, Colorado State University.

2022  
[M8] Advisor. Nath, A. (2022). *Linear Mappings: Semantic Transfer from Transformer Models for Cognate Detection and Coreference Resolution*. Master’s thesis, Colorado State University.

[M7] Advisor. Garcia, J. S. (2022). *Applications of Topological Data Analysis to Natural Language Processing and Computer Vision*. Master’s thesis, Colorado State University.

[M6] Advisor. Patchava, R. S. (2022). *Evaluating Interchangeability of Face Feature Vectors*. Master’s project, Colorado State University.

[M5] Advisor. Pandya, K. A. (2022). *Qualitative Spatial Relation Representation with ML Embedding Spaces*. Master’s project, Colorado State University.

2021  
[M4] Advisor. Mogullapalli, S. (2021). *Mapping Between Face Recognition Feature Vector from Various CNN Models*. Master’s project, Colorado State University.

[M3] Advisor. Gaddam, S. (2021). *Exploring Embedding Spaces in Transformers by Mapping Feature Vectors*. Master’s project, Colorado State University.

[M2] Advisor. Katragadda, M. (2021). *Distributed Training of 3D Object Recognition Using Point Clouds*. Master’s project, Colorado State University.

2018  
[M1] Reader. Storozum, J. (2018). *Opposites Attract—Or Do They?: Investigating Negated Verbs in Distributional Semantic Space*. Master’s thesis, Brandeis University.

#### Current Ph.D. Students

Nada Alalyani

Mariah Bradford (co-advised with N. Blanchard)

Brittany Cates (co-advised with S. Sreedharan)

Anju Gopinath

Sadaf Ghaffari

Ibrahim Khebour (co-advised with N. Blanchard)

Shadi Manafi

Sheikh Mannan

Abhijnan Nath

#### Current M.S. Students

Avyakta Chelle

Hannah VanderHoeven (co-advised with N. Blanchard)

## Current Undergraduate Mentees

Jade Collins  
Aidan Franklin  
August Garibay  
Paige Hansen  
Benjamin Ibarra  
Carlos Mabrey  
Quincy Meisman  
Nels Motley

## 4 Academic Service

- 2024 Senior area chair: Multimodality, Cross-modality (including Sign Languages, Vision and Other Modalities), Multimodal Applications, Grounded Language Acquisition, and HRI, International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING). Turin, Italy.  
Program committee, International Conference on Machine Learning (ICML). Vienna, Austria.  
Program committee, International Conference on Learning Representations (ICLR). Vienna, Austria.  
Program committee, Meeting of the Cognitive Science Society (CogSci). Rotterdam, Netherlands.  
Program committee, Conference on Language Modeling (COLM). Philadelphia, PA, USA.  
Program committee, Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA). Turin, Italy.  
On-call reviewer for ACL Rolling Review (ACL, NAACL, EMNLP).
- 2023 Program committee, Meeting of the Association for Computational Linguistics (ACL). Toronto, ON, Canada.  
Program committee, Conference on Neural Information Processing Systems (NeurIPS). New Orleans, LA, USA.  
Program committee, International Conference on Computational Semantics (IWCS). Nancy, France.  
Program committee, Meeting of the Cognitive Science Society (CogSci). Sydney, NSW, Australia.  
Program committee, AAAI Conference on Artificial Intelligence (AAAI). Washington, DC, USA.  
Program committee, Conference on Learning from Small Data (LSD). Gothenburg, Sweden.  
Program committee, Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA). Nancy, France.

- On-call reviewer for ACL Rolling Review (ACL, NAACL, EMNLP).
- 2022 Area chair: Multimodal NLP, Grounded Language Acquisition, and Human–Robot Interaction, International Conference on Computational Linguistics (COLING). Gyeongju, Korea.
- Ethics board, International Conference on Computational Linguistics (COLING). Gyeongju, Korea.
- Program committee: Dialogue and Interactive Systems and Speech and Multimodality Processing tracks, Meeting of the Asian Chapter of the Association for Computational Linguistics and International Joint Conference on Natural Language Processing (AAACL-IJCNLP). Taipei, ROC.
- Program committee, AAAI Conference on Artificial Intelligence (AAAI). Virtual meeting (Hosted: Vancouver, BC, Canada).
- Program committee, Meeting of the Cognitive Science Society (CogSci). Toronto, ON, Canada.
- Program committee, Conference on (Dis)embodiment. Gothenburg, Sweden.
- Program committee, Workshop on Bridging Human-Computer Interaction and Natural Language Processing (HCI+NLP). Seattle, WA, USA.
- Program committee, Workshop on Annotation, Recognition and Evaluation of Actions (AREA). Galway, Ireland.
- On-call reviewer for ACL Rolling Review (ACL, NAACL, EMNLP).
- Journal reviews: *Frontiers in Neurorobotics*, *Human-Computer Interaction*, *Artificial Intelligence Review*, *International Journal of Human-Computer Interaction*.
- 2021 Organizing committee, Beyond Language: Workshop on Multimodal Semantic Representation (MMSR). Virtual meeting (Hosted: Groningen, The Netherlands).
- Program committee, Goal Reasoning Workshop (GRW). Virtual meeting (Hosted: Dayton, OH, USA).
- Program committee, Conference on Reasoning in Interaction (ReInAct). Gothenburg, Sweden.
- Program committee: Language Grounding to Vision, Robotics and Beyond track, Meeting of the Association for Computational Linguistics and International Joint Conference on Natural Language Processing (ACL-IJCNLP). Virtual meeting (Hosted: Bangkok, Thailand).
- Program committee, International Conference on Computational Semantics (IWCS). Virtual meeting (Hosted: Groningen, The Netherlands).
- Program committee, Meeting of the Cognitive Science Society (CogSci). Vienna, Austria.
- Program committee: Language Grounding to Vision, Robotics and Beyond track, Meeting of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT). Virtual meeting (Hosted: Mexico City, Mexico).
- Program committee: Language Grounding to Vision, Robotics and Beyond track, Meet-

- ing of the European Chapter of the Association for Computational Linguistics (EACL). Virtual meeting (Hosted: Kyiv, Ukraine).
- Program committee, AAAI Conference on Artificial Intelligence (AAAI). Virtual meeting (Hosted: San Francisco, CA, USA).
- Program committee, Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA). Virtual meeting (Hosted: Groeningen, The Netherlands).
- 2020 Program committee, Meeting of the Asia-Pacific Chapter of the Association for Computational Linguistics and International Joint Conference on Natural Language Processing (AACL-ICJNLP). Virtual meeting (Hosted: Suzhou, China).
- Program committee, Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA).
- Program committee, Language Grounding to Vision, Robotics and Beyond area, Conference on Empirical Methods in Natural Language Processing (EMNLP). Virtual meeting (Hosted: Punta Cana, Dominican Republic).
- Program committee, Meeting of the Cognitive Science Society (CogSci). Virtual meeting (Hosted: Toronto, ON, Canada).
- Program committee, Language Grounding to Vision, Robotics and Beyond area, Meeting of the Association for Computational Linguistics (ACL). Virtual meeting (Hosted: Seattle, WA, USA).
- Program committee, AAAI Conference on Artificial Intelligence (AAAI). New York, NY, USA.
- Program committee: Student session, Web Summer School on Logic, Language, and Information (WeSSLI). Virtual meeting (Hosted: Waltham, MA, USA).
- Program committee: Special session on Gestures and Natural Language Semantics: Investigations at the Interface at *Sinn und Bedeutung* (SuB25-Gestures). London, England, UK.
- Journal Reviews: IEEE *Transactions on Cognitive and Developmental Systems*.
- 2019 Program committee: Speech, Vision, Robotics, Multimodal and Grounding area (long and short papers), Conference on Empirical Methods in Natural Language Processing and International Joint Conference on Natural Language Processing (EMNLP-IJCNLP). Hong Kong.
- Program committee: Vision, Robotics, Multimodal, Grounding and Speech area, Meeting of the Association for Computational Linguistics (ACL). Florence, Italy.
- Program committee, Meeting of the Cognitive Science Society (CogSci). Montréal, QC, Canada.
- Program committee: Semantics area (long papers), Meeting of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (NAACL-HLT). Minneapolis, MN, USA.
- 2018 Program committee, Workshop on Dialogue and Perception (DaP). Gothenburg, Sweden.
- Pre-submission mentor, Student Research Workshop, Meeting of the North American Chapter of the Association for Computational Linguistics (NAACL). New Orleans, LA,

USA.

Program committee, Workshop on Annotation, Recognition and Evaluation of Actions (AREA). Miyazaki, Japan.

### Media Coverage

*The Wall Street Journal*, WNYW FOX 5 New York, *5280 Magazine*, *North Forty News*, WHYY's *The Pulse* (National Public Radio), CSU SOURCE Magazine.

### Professional Membership

Association for Computational Linguistics (ACL), Association for the Advancement of Artificial Intelligence (AAAI), Linguistic Society of America (LSA), European Language Resource Association (ELRA).