Tushaar Gangavarapu

456 Gates Hall
Cornell University
Ithaca, NY

TG352@cornell.edu
https://tushaargvs.github.io

Education

2022−2024 MS in Computer Science, Cornell University
2023−24: *Linear recurrent models for language modeling*
Committee: Alexander "Sasha" Rush (chair) and David Bindel
2022−24: *Forecasting derailment in online conversations.*
Advisors: Cristian Danescu-Niculescu-Mizil (2022−24) and Lillian Lee (2022−23)

2015−2019 BTech in Information Technology, NIT Karnataka
Thesis: *Psychological and behavioral traits in social-media language*
Committee: Ram Mohana Reddy Guddeti (chair), Sowmya Kamath S, Nagamma Patil, Biju R Mohan

Experience

Spring 2025 Co-instructor (with Karthik Sridharan), Cornell University
CS 3780/5780: Intro to Machine Learning

Summer 2024 Research Intern, Cornell Tech. Advisor: Sasha Rush
Worked on understanding the role of recurrence in hybrid models using sparse autoencoders

Summer 2023 Research Intern, Cornell Tech. Advisor: Sasha Rush
Worked on authorship identification in cross-domain settings

06/2019−08/2022 Applied Scientist (2021−2022), Research Engineer (2019−2021), Amazon
Worked on automated algorithms to enhance user engagement in ebooks
(Research published at AMLC 2022)

Summer 2018 Software Intern, Kindle Create, Amazon

Awards and honors

2022−23, 2023−24 Cornell Bowers CIS Best TA Award
CS 4740 (NLP), CS 4300 (Language and Information)

2018−2019 Huawei National Scholarship for Academic Excellence

2013−2015 National Higher Secondary Education Scholarship
(National rank: 10)

2012 South-Indian Mathematics Olympiad (national rank: 32)

Publications

Google Scholar: https://scholar.google.com/citations?user=C7v_cA8AAAAJ.

Current research interests. NLP → LLMs → alternate-attention architectures → compute-efficient models (e.g., linear RNNs), interpretability (for model design)

[1] Junxiong Wang, Tushaar Gangavarapu, Jing Nathan Yan, and Alexander M. Rush. MambaByte: Token-free Selective State Space Model, August 2024. URL http://arxiv.org/abs/2401.13660. arXiv:2401.13660

[2] Johannes Knittel, Tushaar Gangavarapu, Hendrik Strobelt, and Hanspeter Pfister. GPT-2 Through the Lens of Vector Symbolic Architectures. October 2024. URL https://neurips.cc/virtual/2024/workshop/84704

[3] Yann Hicke, Abhishek Masand, Wentao Guo, and Tushaar Gangavarapu. Assessing the efficacy of large language models in generating accurate teacher responses. In Ekaterina Kochmar, Jill Burstein, Andrea Horbach, Ronja Laarmann-Quante, Nitin Madnani, Anaïs Tack, Victoria Yaneva, Zheng Yuan, and Torsten Zesch, editors, *Proceedings of the 18th Workshop on Innovative Use of NLP for Building Educational Applications (BEA 2023)*, pages 745–755, Toronto, Canada, July 2023. Association for Computational Linguistics. doi: 10.18653/v1/2023.bea-1.60. URL https://aclanthology.org/2023.bea-1.60

[4] Tushaar Gangavarapu and Sriraghavendra Ramaswamy. Alexa, stop reading the references: Enhancing the reading experience in Kindle eBooks. In *Proceedings of the Amazon Machine Learning Conference*, Seattle, WA, 2022a. Amazon

[5] Tushaar Gangavarapu and Sriraghavendra Ramaswamy. A figure is worth a thousand words, but where are the words?: Enhancing image experience in Kindle eBooks. In *Proceedings of the Amazon Machine Learning Conference*, Seattle, WA, 2022b. Amazon

[6] Tushaar Gangavarapu, Gokul S Krishnan, Sowmya Kamath S, and Jayakumar Jeganathan. FarSight: Long-Term Disease Prediction Using Unstructured Clinical Nursing Notes. *IEEE Transactions on Emerging Topics in Computing*, 9(3):1151–1169, July 2021. ISSN 2168-6750. doi: 10.1109/TETC.2020.2975251. URL https://ieeexplore.ieee.org/document/9007352. Conference Name: IEEE Transactions on Emerging Topics in Computing

[7] Veena Mayya, Sowmya Kamath S., Gokul S. Krishnan, and Tushaar Gangavarapu. Multi-channel, convolutional attention based neural model for automated diagnostic coding of unstructured patient discharge summaries. *Future Generation Computer Systems*, 118:374–391, May 2021. ISSN 0167-739X. doi: 10.1016/j.future.2021.01.013. URL https://www.sciencedirect.com/science/article/pii/S0167739X21000236

[8] Tushaar Gangavarapu, Aditya Jayasimha, Gokul S. Krishnan, and Sowmya Kamath S. Predicting ICD-9 code groups with fuzzy similarity based supervised multi-label classification of unstructured clinical nursing notes. *Knowledge-Based Systems*, 190:105321, February 2020b. ISSN 0950-7051. doi: 10.1016/j.knosys.2019.105321. URL https://www.sciencedirect.com/science/article/pii/S0950705119305982

[9] Aditya Jayasimha, Tushaar Gangavarapu, S. Sowmya Kamath, and Gokul S. Krishnan. Deep Neural Learning for Automated Diagnostic Code Group Prediction Using Unstructured Nursing Notes. In *Proceedings of the 7th ACM IKDD CoDS and 25th COMAD*, CoDS COMAD 2020, pages 152–160, New York, NY, USA, January 2020. Association for Computing Machinery. ISBN 978-1-4503-7738-6. doi: 10.1145/3371158.3371176. URL https://dl.acm.org/doi/10.1145/3371158.3371176

[10] Tushaar Gangavarapu, C. D. Jaidhar, and Bhabesh Chanduka. Applicability of machine learning in spam and phishing email filtering: review and approaches. *Artificial Intelligence Review*, 53(7):5019–5081, October 2020a. ISSN 1573-7462. doi: 10.1007/s10462-020-09814-9. URL https://doi.org/10.1007/s10462-020-09814-9

[11] Tushaar Gangavarapu, Gokul S Krishnan, and Sowmya Kamath S. Coherence-based Modeling of Clinical Concepts Inferred from Heterogeneous Clinical Notes for ICU Patient Risk Stratification. In Mohit Bansal and Aline Villavicencio, editors, *Proceedings of the 23rd Conference on Computational Natural Language Learning (CoNLL)*, pages 1012–1022, Hong Kong, China, November 2019. Association for Computational Linguistics. doi: 10.18653/v1/K19-1095. URL https://aclanthology.org/K19-1095

[12] Tushaar Gangavarapu and Nagamma Patil. A novel filter–wrapper hybrid greedy ensemble approach optimized using the genetic algorithm to reduce the dimensionality of high-dimensional biomedical datasets. *Applied Soft Computing*, 81:105538, August 2019. ISSN 1568-4946. doi: 10.1016/j.asoc.2019.105538. URL https://www.sciencedirect.com/science/article/pii/S156849461930314X

Invited talks, lectures, etc.

2024	Seagull LM: Generating humorous captions from scene descriptions Lecture for CS 4740/5740: Natural Language Processing, Cornell University
2024	Tension with a chance of personal attack! Guest lecture for UNILWYL 1405, Cornell University
2024	Gradient-based optimization and automatic differentiation Lecture for CS 4740/5740: Natural Language Processing, Cornell University Lecture notes: https://github.com/TushaarGVS/backprop-lecture-notes-CS-4740
2020	Learning to Predict: Tree-based Classification Guest lecture at the Machine Learning University (MLU), Amazon Notes: https://tushaargvs.github.io/assets/teaching/dt-notes-2020.pdf
2020	Cognitive and Affective Assessments in Game-based Simulations Invited talk at the Dept. of Information Technology, NITK
2020	Greedy Evolutionary Feature Selection for Biomedical Data Invited talk at the Dept. of Information Technology, NITK
2019	On the Convergence of HPC and Machine Intelligence Invited talk at High Performance Computing and Applications (HPCA)
2019	Exploring Latent Human Traits Through Social Media Modeling Guest lecture at the Dept. of Information Technology, NITK
2019	Game-based Learning and Assessment: A Case Study of a Mobile-VR Game. Guest lecture at the Dept. of Information Technology, NITK
2019	Building Predictive Applications Using Social Media Digital Footprints. Invited talk at the Workshop on Predictive Analytics and Applications (PAA)

Teaching

Spring 2025	Co-instructor, CS 3780/5780: Intro to Machine Learning Cornell University
Fall 2024	Head TA, CS 4701: Practicum in AI (mentored 6 project teams) Cornell University

Spring 2023, Spring 2024	Head TA, CS/INFO 4300: Language and Information Cornell University
Fall 2022, Fall 2023	Head TA (Fall 2023), Grad TA (Fall 2022), CS 4740/5740: NLP Cornell University

Service

2024	Reviewer, EMNLP
2022	Reviewer, Amazon Machine Learning Conference (AMLC): Healthcare Informatics and NLP track
2021−2022	Organizer, Kindle algorithms weekly research meetings, Amazon

(Last compiled: 11/10/2024. Template inspired from Chris Manning.)