

Sushrita Rakshit

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Ann Arbor, MI - 48104, Unites States

EDUCATION

• University of Michigan

Bachelor's of Science and Engineering (BSE) in Computer Science, Minor in Statistics

◦ GPA: 3.58/4.00

August 2021 - May 2025




Ann Arbor, Michigan

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, W=WORKSHOP, P=PATENT, S=IN SUBMISSION, T=THESIS

- [W.1] [Sushrita Rakshit](#)¹, James Hale², Kushal Chawla³, Jeanne Brett⁴, Jonathan Gratch⁵ (2024). **Towards Emotionally-Aware Agents for Dispute Resolution**. Manuscript submitted to *EMNLP SiCon*.
- [J.1] Hua Shen¹, Tiffany Kneare², Reshmi Ghosh², Kenan Alkiek³, Kundan Krishna³, Yachuan Liu³, Ziqiao Ma³, Savvas Petridis³, Yi-Hao Peng³, Li Qiwei³, [Sushrita Rakshit](#)³, Chenglei Si³, Yutong Xie³, Jeffrey P. Bigham⁴, Frank Bentley⁴, Joyce Chai⁴, Zachary Lipton⁴, Qiaozhu Mei⁴, Rada Mihalcea⁴, Michael Terry⁴, Diyi Yang⁴, Meredith Ringel Morris⁵, Paul Resnick⁵, David Jurgens⁵. (2024). **Towards Bidirectional Human-AI Alignment: A Systematic Review for Clarifications, Framework, and Future Directions**. *arXiv preprint*, arXiv:2406.09264. Manuscript submitted to *ACM CSUR*.
- [S.1] Jonathan Ivey¹, Shivani Kumar¹, Jiayu Liu¹, Hua Shen¹, [Sushrita Rakshit](#)¹, Rohan Raju¹, Haotian Zhang¹, Aparna Ananthasubramaniam¹, Junghwan Kim¹, Bowen Yi¹, Dustin Wright¹, Abraham Israeli¹, Anders Moller¹, Lechen Zhang¹ (2024). **More Human than Humans: Using LLMs to Simulate Human Dialogue**. Manuscript submitted to *idk where*. Note: the authorship order is first author randomized.
- [S.1] Yinuo Xu¹, [Sushrita Rakshit](#)¹, Aparna Ananthasubramaniam¹, Omkar Yadav¹, Mingqian Zheng¹, Michael Jiang¹, Lechen Zhang¹, Bowen Yi¹, Kenan Alkiek¹, Abraham Israeli¹, Bangzhao Shu¹, Hua Shen¹, Jiaxin Pei¹, Haotian Zhang¹, Miriam Schirmer¹, David Jurgens¹ (2024). **Please Reply: Causally Modeling the Linguistic and Social Factors that Predict Email Response**. Manuscript submitted to *EMNLP*. Note: the authorship order is first author randomized.

EXPERIENCE

- **Independent Research - Human-LLM Speech Acts**  September 2024 - Present
Bringing Large-scale Analytical Breakthroughs Laboratory - Advised by Hua Shen and David Jurgens Ann Arbor, MI
◦ Filler
- **University of Southern California - Institute for Creative Technologies**  May 2024 - August 2024
Dispute Resolution Agents - Affective Computing Lab Advised by Jonathan Gratch Playa Vista, CA
◦ Created hierarchical representation of dyadic data by encoding utterances via BERT and RoBERTa and concatenating encoded values into conversation matrix.
◦ Morphed multi-turn dyadic data into "sliding window" - would introduce new utterance and pad remaining conversation with 0s. Formatted data was used for masked language modeling.
◦ Trained custom Pytorch model with 2 fully connected layers and 2 separate outputs using BERT CLS token. Model trained to predict each disputer's values. Achieved 0.42 F1-score on sellers and 0.74 on buyers.
◦ Studied emotion dynamics between disputers to understand impasse and agreement cases. Causal analysis of emotional factors resulting in subjective outcomes (instrumental satisfaction, relationship satisfaction) and objective outcomes (impasse or walkaway). High coefficient of determination for modeling methods.
◦ Proposed novel annotation schema for emotion modeling in dispute cases. Outperformed existing methods (T5-Twitter for inference).
- **Independent Research - Explainable AI**  January 2024 - August 2024
Bringing Large-scale Analytical Breakthroughs Laboratory - Advised by Hua Shen and David Jurgens Ann Arbor, MI
◦ Defining computational criteria for reflected human values such as honesty, consistency, scope, and repetition within Large Language Models. Data aggregation and annotations of validation and test set coordinated by Amazon Mechanical Turk usage. Clearly defined annotation guidelines for Amazon Turk users, resulting in high Cohen's kappa.
◦ Training encoder-only (GPT2), decoder-only (RoBERTa), and encoder-decoder (T5-small) architecture models on datasets such as HotpotQA, llm_hallucinations, etc. and benchmarking initial model performance on human values. Model baseline comparison was zero-shot generation.

- Creation of fine-tuning pipeline using RLHF and training reward model. Separately applied Direct Policy Optimization (DPO) with Supervised-Finetuning. Evaluation of both model performance after fine-tuning on testing dataset with incorporation of metrics such as exact match, BERTScore, precision, recall, and human rankings of final model responses.

• Research - Large Language Models (David Jurgens) [🌐]

August 2023 - Present

Bringing Large-scale Analytical Breakthroughs Laboratory - Advised by David Jurgens

Ann Arbor, MI

- Web Scraping popular platforms like Yelp and Yellow Pages in python, utilizing Google Maps API and BeautifulSoup to generate over 55,000,000,000+ routes around Ann Arbor that were smart-sampled for model training data.
- Training transformer and causal models (GPT2, OPT, T5, etc) to respond to landmark-driven routing via Accelerate library scripts to test if model architecture has effect on spatial retention. Benchmarking performance via smart-sampled valuation set of routes.
- Modeled information loss and other training metrics via wandDB software and analyzed model performance in real-time across 9+ layers in each model.
- Created and tested custom evaluation metrics and results made via Jaccard Indexing to gauge model performance in "turning" at correct locations. Parsing of model outputs to filter for performance benchmark (rouge score, recall, precision, perplexity)
 - * "Turning" at correct locations
 - * Identifying relevant cardinality (i.e. knows to go north instead of south)
 - * Overall difference in distance between where model ends up and ground truth coordinate

• Advanced Propulsions Concepts Laboratory [🌐]

May 2023 - August 2023

Research Intern - Natural Language Processing (Summer 2023)

Ann Arbor, MI

- Developed an advanced Aerospace chatbot in python by leveraging historical Piazza data and cutting-edge NLP models (LlaMa, Alpaca, and Vicuna) with Langchain and ChromaDB libraries. Achieved 30% faster information retrieval time.
- Experimented with changing backend of RAG retriever to domain-specific aerospace papers. Changed vectorDB dependencies such as embedding size and measured retrieval time trade-off. Optimized model was 15% more accurate (ie fetched better summaries according to hand evaluation by APCL masters students) than initial model, but trade-off was 30 seconds slower at retrieval.

• Computational Vascular Biomechanics Laboratory [🌐]

Nov 2022 - July 2023

R&D Intern - Computer Vision and Data Augmentation

Ann Arbor, MI

- Spearheaded left coronary artery generator using NumPy and Pandas, expanding AngioNet's dataset. Generated data resulted in 30% increase of model accuracy and robustness after resolving high-impact bugs.
- Designed Python scripts with NumPy and Matplotlib to compare 300+ Real vs. Synthetic Left Coronary Trees. Deduced optimal branch rotation angles, generating physiologically accurate synthetic data for research and training.
- Trained YOLOv5 and discovered stenosis weights for de-identified angiograms. This generated new data that was used to fine-tune the deep learning model. Achieved 15% reduction in false positives during stenosis detection using cropping techniques.

SKILLS

- **Programming Languages:** Python, C, C++, HTML, CSS, JavaScript, TypeScript, MATLAB, R, SQL
- **Technologies:** Trello, Jira, Slack, Figma
- **Data Science & Machine Learning:** NumPy, Pandas, PyTorch, TensorFlow, Scikit-learn, Seaborn
- **Cloud Technologies:** AWS
- **DevOps & Version Control:** Git
- **Mathematical & Statistical Tools:** SPSS, R, Matplotlib

HONORS AND AWARDS

• Regent Merit Scholar

August 2021

University of Michigan



- Regent scholarships are awarded to the top 1100 or so in state freshmen (approximately 1/3)
- \$750 per semester first-year only (\$1500 total); non-renewable

LEADERSHIP EXPERIENCE

• Navigation and Autonomous Task Planning Team

Month Year - Month Year

UM::Autonomy (Autonomous Boat Team)



- Understand and plan for the "tasks" associated with year's competition; program iROS to avoid task obstacles such as buoys, cylinders, and inflated balls.
- Co-lead demo and testing rounds in the Canham Natatorium. Mimic competition setup and adjust autonomous program as needed after coordinating with computer vision programming team.

PROFESSIONAL MEMBERSHIPS

- **Orchid**, Membership ID: 0009-0008-3485-9637 2024 - *Present*
- **OpenReview**, Membership ID: sushrita@umich.edu 2023 - *Present*