Aniketh Janardhan Reddy

✉ aniketh@eecs.berkeley.edu
⌂ anikethjr.github.io
in linkedin.com/in/aniketh-reddy

Education

University of California, Berkeley, *Berkeley, CA*, Expected 2025
Doctor of Philosophy (PhD) in Computer Science, GPA: 4.0/4.0.

Carnegie Mellon University - School of Computer Science, *Pittsburgh, PA*, Dec 2019
Master of Science in Machine Learning, QPA: 4.11/4.33.

Birla Institute of Technology and Science (BITS), Pilani, *Hyderabad, India*, Jul 2018
Bachelor of Engineering (Honours) Computer Science, CGPA: 9.93/10.

Research Experience

Graduate Student, UC Berkeley, *Berkeley, CA*. Jan 2021–Present
- I am advised by Prof. Nilah Ioannidis and the focus of my PhD is on understanding and engineering gene expression using machine learning (ML) methods. The three main directions of my research are:
  - Building better biological models such as those that predict gene expression and protein fitness.
  - Designing regulatory sequences that induce differential gene expression in certain target cells using model-based optimization techniques.
  - Identifying the biological factors that control alternative splicing using predictive modelling.

Research Assistant, Carnegie Mellon University, *Pittsburgh, PA*. Aug 2018–Dec 2019
- Worked with Prof. Leila Wehbe on understanding the representation of language syntax in the human brain using functional magnetic resonance imaging (fMRI) and ML.
- Effort-based metrics widely used to study syntax processing do not explicitly encode syntactic structure. We proposed subgraph embedding-based features that encode syntactic structure and showed that they are predictive of brain activity, even after controlling for effort. Our results indicated that syntax processing is distributed across the language network and that there is some evidence of hierarchical structure building and prediction of future syntactic information in the brain. Using BERT embeddings, we also showed that the regions that process syntax are a subset of those that process semantics.

Intern, Smart Data Analytics Research, Universität Bonn, *Bonn, Germany*. May 2017–Aug 2018
- Worked on several projects in the broad area of automated fact verification under the tutelage of Prof. Dr. Jens Lehmann.
- Developed a fact verification system called DeFactoNLP which could not only assess the veracity of a claim but also retrieve supporting evidences from Wikipedia. The system made use of named entity recognition (NER), TF-IDF vector comparisons and a Decomposable Attention-based natural language inference model.
- Built a system which could ascertain the credibility of a website using handcrafted features derived from the text and visuals present on the website. Also, co-developed and benchmarked DeFacto, a triple verification framework.

Research Intern, Cognition Lab, Indian Institute of Science (IISc), *Bangalore, India*. Jan 2018–May 2018
- Used fMRI and ML to identify brain regions involved in covert attention modulation under the guidance of Prof. Sridharan Devarajan.
- This was accomplished by analyzing which regions' activations were most predictive of times at which a participant was required to pay covert attention. Many deep learning-based seq2seq models were tested in this context. Our analysis showed that certain regions of the frontal lobe, the basal ganglia and the posterior parietal cortex all act in unison to modulate covert attention and that the effects of attention modulation can be seen in visual cortical areas.

Industrial Experience

Machine Learning Intern, Patch Biosciences, *New York, NY*. May 2023–Aug 2023
- Explored strategies to improve an ML-based pipeline for designing biological sequences.

Software Engineer, Microsoft, *Bellevue, WA*. Jan 2020–Jan 2021
- Worked on improving the quality of related searches shown on the Bing image search vertical. This was done by both improving ranking algorithms and the quality of candidate suggestions, mostly through the deployment of state-of-the-art ML models at scale. These changes significantly boosted user engagement and revenue.

Software Engineer Intern, Microsoft, *Sunnyvale, CA*. May 2019–Aug 2019
- Devised a new demand-based autoscaler for Application Gateways as a member of the Azure Networking group. This led to a $\sim 66\%$ reduction in the number of dropped requests compared to the previous system.

Teaching Experience

Graduate Student Instructor (GSI), UC Berkeley, *Berkeley, CA*. Aug 2022–Dec 2022
- One of the two head GSIs for CS176, a course on algorithms used in computational biology, taught by Prof. Nilah Ioannidis and Prof. Yun Song. My responsibilities included teaching a weekly discussion section with ~ 20 students, preparing homeworks, and grading examinations.

Teaching Assistant, BITS Pilani, *Hyderabad, India*. Aug–Dec 2017, Jan–May 2017, Aug–Dec 2016
- Teaching assistant for courses on ML, discrete structures for computer science, and development studies. I was responsible for preparing and grading assignments.

Honors

Graduate Research Grant, Hearts to Humanity Eternal (H2H8) Association. Aug 2022

Gold Medal, for best academic record (highest CGPA), BITS Pilani, Hyderabad. Aug 2018

Best All-Rounder Award, in recognition of multidimensional achievements, BITS Pilani, Hyderabad. Aug 2018

Merit Scholarship, BITS Pilani, Hyderabad. 2014–18

Working Internships in Science and Engineering Scholar, German Academic Exchange Service. 2017

Publications

- Lucas Ferreira DaSilva, Simon Senan, Zain Munir Patel, **Aniketh Janardhan Reddy**, Sameer Gabbita, Zach Nussbaum, Cesar Miguel Valdez Cordova, Aaron Wenteler, Noah Weber, Tin M Tunjic, Talha Ahmad Khan, Zelun Li, Cameron Ray Smith, Matei Bejan, Lithin Karmel Louis, Paola Cornejo, Will Connell, Emily S Wong, Wouter Meuleman, and Luca Pinello. 2024. DNA-Diffusion: Leveraging Generative Models for Controlling Chromatin Accessibility and Gene Expression via Synthetic Regulatory Elements. *In preparation.* [Preprint]

- **Aniketh Janardhan Reddy***, Xinyang Geng*, Michael H. Herschl*, Sathvik Kolli, Aviral Kumar, Patrick D. Hsu, Sergey Levine, and Nilah Ioannidis. 2023. Designing cell type-specific promoter sequences using conservative model-based optimization. MLCB 2023, *In preparation.*

- **Aniketh Janardhan Reddy***, Michael H. Herschl*, Sathvik Kolli, Amy X. Lu, Xinyang Geng, Aviral Kumar, Patrick D. Hsu, Sergey Levine, and Nilah Ioannidis. 2023. Pretraining strategies for effective promoter-driven gene expression prediction. *In preparation* [Preprint]

- **Aniketh Janardhan Reddy** and Leila Wehbe. 2021. Can fMRI reveal the representation of syntactic structure in the brain? Advances in Neural Information Processing Systems 34 (NeurIPS 2021). [Paper][Code]

- **Aniketh Janardhan Reddy** and Sridharan Devarajan. 2018. Analyzing Human Attentional Mechanisms using Functional Magnetic Resonance Imaging Data and Machine Learning. *Undergraduate thesis.* [Paper]

- **Aniketh Janardhan Reddy**, Gil Rocha, and Diego Esteves. 2018. DeFactoNLP: Fact Verification using Entity Recognition, TFIDF Vector Comparison and Decomposable Attention. FEVER 2018 at EMNLP 2018. [Paper][Code]

- Diego Esteves, **Aniketh Janardhan Reddy***, Piyush Chawla*, and Jens Lehmann. 2018. Belittling the Source: Trustworthiness Indicators to Obfuscate Fake News on the Web. FEVER 2018 at EMNLP 2018. [Paper][Code]

- **Aniketh Janardhan Reddy**, Monica Adusumilli, Sai Kiranmai Gorla, Lalita Bhanu Murthy Neti, and Aruna Malapati. 2018. Named Entity Recognition for Telugu using LSTM-CRF. WILDRE4 at LREC 2018. [Paper][Code]

- Diego Esteves, Anisa Rula, **Aniketh Janardhan Reddy**, and Jens Lehmann. 2018. Toward Veracity Assessment in RDF Knowledge Bases: An Exploratory Analysis. J. Data and Information Quality 9, 3, Article 16 (February 2018). [Paper]

*Equal contributions