

Nikhil Pavan Kanaka

 npkanaka.github.io

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 github.com/npkanaka

RESEARCH INTERESTS

I am broadly interested in foundation-scale large language, speech, and multimodal models. My goal is to advance these models to further the development of general AI and enhance the effectiveness and reliability of language agents. I aim to create robust AI systems that can seamlessly integrate into various applications, significantly improving automation and accessibility.

EDUCATION

Ohio State University

MS by thesis in Computer Science (NLP)

Jan 2023 - Dec 2024

- Advisors: *Dr. Sachin Kumar, Dr. Rajiv Ramnath*
- Related Coursework: *Speech and Language Processing, High Performance Deep Learning, Advanced Computer Architecture, Fairness and Security in AI, Advanced Algorithms, Research methods*

GRIET

Bachelor of Technology in Computer Science and Engineering, CGPA: 9.39/10

Oct 2020

- Related Coursework: *Artificial Intelligence, Neural Networks, Design and Analysis of Algorithms*

ACADEMIC PROJECTS

Implicit Reasoning in LLMs, Mentor: Dr. Sachin Kumar, OSU

Ongoing Thesis: LLM reasoning by investigating parametric memory for complex tasks. [\[info\]](#)

911AIPredict, Mentor: Dr. Rajiv Ramnath, OSU

Support system for 911 services. Fine-tuned LLMs and a RAG framework integrating vector databases and knowledge graphs, elevating medical assessment accuracy, optimizing unit deployment. [\[info\]](#)

Voicequity, Mentor: Dr. Srinivasan Parthasarathy, OSU

Advanced ASR fairness by creating a novel metamorphic testing framework to expose and address bias, driving robust and inclusive voice recognition solutions for global demographics. [\[report\]](#)

Long-Answer Question, Mentor: Dr. Chris Brew, OSU

Developed a pipeline using LongFormer attention and generation models to create long-answer questions from academic texts, achieving high semantic accuracy through evaluation. [\[report\]](#)

HiDL, Mentor: Dr. DK Panda, OSU

- Engineering JAVA Bindings for MVAPICH and advancing GPU-accelerated workflows within NVIDIA's Spark-Rapids, GDS, and DALI to set new benchmarks in HPC+AI. [\[info\]](#)
- Investigating GPU Offloading in NVIDIA Rapids. [\[report\]](#)

LogiChain, OSU

Augments LLMs with symbolic solvers to enhance deductive reasoning by translating natural language into symbolic logic. Performance gain was up to 30% over LLM-based approaches. [\[code\]](#)

Benchmarking of File Systems, Mentor: Dr. Ting Zhu, OSU

Performance Benchmarking of File Systems for handling massive data workloads. [\[report\]](#)

ProdReview, Amazon Research

E-commerce review analysis platform with sentiment intelligence and a novel graph-based summarization for actionable, product-specific insights. [\[info\]](#)

INDUSTRIAL EXPERIENCE

Enterprise Data Analytics

Data Science Intern

Jan 2024 – Dec 2024

Led a data migration project, improving efficiency by 84.4%, reducing processing time from 6 hours to 56 minutes through AWS Airflow (MWAA) parallel loading and ConnectorX optimization, while enhancing backend systems and data pipelines to scale processing by 4.5 times.

Wexner Medical Center

Research Intern

May 2023 – Aug 2023

Spearheaded data validation initiatives, reducing validation time by 96%, while deploying NLP solutions to analyze 250K+ feedback entries, improving program effectiveness and patient care satisfaction, and streamlining schema migration processes, cutting system downtime by 87%.

Ninjacart

Senior Software Engineer

Jun 2022 – Dec 2022

Led backend development for a B2B platform, leveraging Java Spring Boot, NodeJS, MongoDB, Kafka, and Apicurio Registry to optimize API consistency, and microservice interoperability, resulting in a 28% surge in transaction volume and boost in transaction efficiency.

Head Digital Works

Software Development Engineer

Feb 2020 - Jun 2022

Spearheaded the design, development, and deployment of high-performance backend systems supporting 80M+ users, with a focus on scalability, and high availability, utilizing AWS, RabbitMQ, and CI/CD pipelines, driving business growth and user engagement through predictive analytics.

SERVICE

- Founding member of the Advanced Academic Center at GRIET, for academic research. [\[link\]](#)
- Technical Head for Spirals, the Language and Literature club of GRIET. [\[link\]](#)
- Tech mentor at Sahaya Society, fostering skill development for the less privileged. [\[link\]](#)

TALKS

Domain-Specific Fine-Tuning 2023

Advancing Analytics in Medical Research at Wexner Medical Center

Unlocking Meaning 2022

NLP's Role in Shaping the Future of Intelligent Systems

Quantum Perspectives on Intelligence 2020

How quantum reshapes our understanding of intelligence, new possibilities for AI

Bridging Minds and Machines 2020

Psychological Impact of AI Evolution

REFERENCES

Dr. Sachin Kumar,
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Email: kumar.1145@osu.edu

Dr. Rajiv Ramnath,
Professor, The Ohio State University.
Email: ramnath.6@osu.edu

Dr. Chris Brew,
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