Abhiram Varma Nandimandalam

Data Scientist | AI | Bioinformatics
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Education

University of Arizona — Tucson, AZ
Master of Science in Data Science | Graduate Certificate in NLP | GPA: 4.0/4.0 — *Aug 2024 – May 2026*

Madanapalle Institute of Technology and Sciences — Andhra Pradesh, India
Bachelor of Technology in Artificial Intelligence and Data Science — *Aug 2020 – May 2024*

Technical Skills

Programming & Data: Python, SQL, R, Pandas, NumPy, ETL Pipelines, Microsoft SQL Server, Student Information Systems (SIS)
Statistics & Modeling: Mixed-Effects Models, Multiple Regression, Semi-partial R^2, Incremental Validity, Bootstrap Methods, Power & Sensitivity Analysis, Hypothesis Testing
AI & NLP: LLMs, RAG, Vector Embeddings, Prompt Engineering, Anthropic Claude, TF-IDF, Semantic Retrieval
Visualization & Apps: Tableau, Power BI, R Shiny, Streamlit, Plotly, Git
Statistical Software: `simr`, `lme4`, R, Python

Professional & Research Experience

Scientific Analyst – Data, AI & Bioinformatics — Jun 2026 – Present
LSCH, Department of Psychology, University of Arizona — *Tucson, AZ*

- **Supervisor:** Dr. David A. Sbarra, Professor of Psychology and Principal Investigator (Laboratory for Social Connectedness & Health)
- Develop research software and computational workflows integrating **statistical modeling, AI, NLP, and interactive analytics** for behavioral science, psychology, and health research
- Lead technical development of an **Associational Variable Analysis (AVA) R Shiny application**, translating a methodological framework for nonexperimental, cross-sectional data into an interactive research tool
- Implement statistical functionality for **zero-order and covariate-adjusted associations, multiple regression, semi-partial R^2, incremental validity, and bootstrap-based indirect-association analyses**
- Develop a **12-pattern classification framework across four associational conditions**, with automated interpretation, configurable thresholds, input validation, and interactive visualizations
- Design and deploy a **mixed-effects power and sensitivity analysis application** using R, `simr`, and `lme4` for hierarchical, clustered, and twin datasets
- Develop statistical workflows for flexible variable selection, covariate specification, factor handling, standardization, and simulation-based evaluation of mixed-effects models
- Develop an **LLM-powered synthetic survey research pipeline (PersonaeAI)** using Python, Anthropic Claude, Pandas, and the ANES 2024 Pilot dataset for **1,500** respondent profiles
- Conduct human-vs-synthetic survey experiments, reporting a **33% reduction in mean total variation distance** with politically enriched AI personas vs. baseline
- Design interactive research dashboards using **Streamlit and Plotly** to examine response distributions, statistical agreement, and discrepancies
- Independently develop an **LLM-assisted systematic literature review platform** with automated PDF ingestion, configurable prompting, structured extraction, validation, and CSV generation
- Expand literature processing from a 20-paper pilot to **309 research papers**, reducing repetitive manual research-data extraction
- Collaborate with academic researchers and quantitative methodologists to refine implementations, validate results, and improve reproducibility and interpretability

Founder — Jun 2026 – Present
Stealth Startup — *United States*

- Founded an independent startup focused on developing technology-driven solutions

Graduate Assistant – Data Science — Aug 2025 – May 2026
Housing & Residential Life (OASI), University of Arizona — *Tucson, AZ*

- **Supervisor:** Linda Scheu, Director of Organizational Assessment & Strategic Initiatives
- Developed and maintained **10+ interactive Tableau dashboards** for institutional assessment, student engagement, housing operations, and strategic planning, with automated daily data refreshes
- Designed automated reporting workflows that reduced manual reporting effort by approximately **60%**
- Conducted quantitative analyses of student engagement, residential experiences, service utilization, and student-support activities using **Python, SQL, and BI tools**
- Developed **NLP workflows using Python and TF-IDF** to analyze unstructured student-care records and summarize themes related to stress, mental health, and physical well-being
- Extracted, cleaned, transformed, and integrated datasets from **Microsoft SQL Server, SIS, and institutional platforms**
- Developed automated **ETL pipelines** with data cleaning, quality assurance, validation, and scheduled reporting
- Collaborated with stakeholders across **Housing & Residential Life, Campus Health, and the Dean of Students** to translate requirements into dashboards and reports
- Supported institutional decision-making, assessment, resource allocation, and student-support planning through descriptive analysis and visualization
- Applied data governance and responsible data-handling practices for sensitive institutional and student-support information

Data Analyst May 2025 – Aug 2025

Campus Health Services, University of Arizona *Tucson, AZ*

- **Supervisor:** Rachel Abraham, MPH, Evaluation Manager
- Supported evaluation of student health programs through analytical datasets, dashboards, and reports covering utilization, mental health, and AOD indicators
- Designed interactive **Tableau and Power BI dashboards** for assessment results, program participation, service utilization, and student health trends
- Contributed to survey reporting improvements supporting evaluation initiatives associated with a reported **25% increase in survey response rates**
- Conducted **cohort comparisons, EDA, and trend assessments using Python and SQL** to evaluate health programs and student-service outcomes
- Integrated data from assessment platforms, survey systems, and health information sources with cleaning, transformation, consistency checks, and validation
- Prepared analytical summaries and visual reports for program evaluators and institutional stakeholders
- Supported responsible handling of sensitive student health information per institutional privacy and data-management procedures

Graduate Research Assistant Aug 2024 – Aug 2025

MITHRA Lab, College of Information Science, University of Arizona *Tucson, AZ*

- **Supervisor:** Dr. Rozhin Yasaei, Assistant Professor and Director, MITHRA Lab (Machine Intelligence for Secure and Autonomous Systems)
- Contributed to **LLM-HyPZ**, applying LLMs and information retrieval to hardware cybersecurity vulnerability discovery
- Supported development and evaluation of a research pipeline analyzing **114,836 CVE records** (2021–2024) for hardware-related vulnerabilities
- Assisted with large-scale data preprocessing, dataset organization, experimental coordination, and AI workflow design
- Applied **LLMs, RAG, vector embeddings, semantic retrieval, and prompt engineering** in research experimentation
- Participated in evaluation of LLM-assisted vulnerability classification and semantic analysis with interdisciplinary researchers
- Supported research contributing evidence to the **MITRE 2025 Most Important Hardware Weaknesses** initiative
- Collaborated with researchers, including contributors affiliated with Intel, on project development and documentation
- Co-authored **"LLM-HyPZ: Hardware Vulnerability Discovery Using an LLM-Assisted Hybrid Platform for Zero-Shot Knowledge Extraction and Refinement,"** IEEE ICDMW 2025
- Contributed to research presented at the **ICDM 2025 LLM4Sec Workshop**

Data Analyst Jan 2023 – Jul 2024

MeeBuddy – Rural India's Digital Buddy *Remote*

- Analyzed user engagement, service adoption, and platform utilization across rural user segments using **Python, SQL, and EDA**
- Extracted, cleaned, and organized operational and user activity data to support engagement and service-usage analysis
- Developed interactive **Tableau dashboards** tracking KPIs including user activity, engagement trends, and digital service adoption
- Examined behavioral patterns and utilization trends to identify opportunities for platform improvement and digital-service expansion
- Communicated findings through visual reports and stakeholder summaries supporting product planning and operational decisions
- Contributed data-driven insights on improving access to digital services in rural and underserved communities

Publications

Lin, Y.-Z., Ghimire, S., Nandimandalam, A., et al. **LLM-HyPZ: Hardware Vulnerability Discovery Using an LLM-Assisted Hybrid Platform for Zero-Shot Knowledge Extraction and Refinement**. IEEE International Conference on Data Mining Workshops (ICDMW 2025). arXiv:2509.00647

Honors & Awards

Distinguished Graduate Scholar, University of Arizona College of Information Science – Spring 2026

Co-Lab Award for Graduate Capstone: Applied Research & Industry Impact, UofA iShowcase – Spring 2026

Certifications

Microsoft Certified: Power BI Data Analyst Associate – Microsoft

Google Data Analytics Certificate – Coursera