Rishabh Baral

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Education

Arizona State University — Tempe, AZ
Master of Science in Computer Science — May 2026

University of Maryland — College Park, MD
Bachelor of Science in Computer Science — May 2024

Research Publications

PHANTOM RECALL: When Familiar Puzzles Fool Smart Models — Jan 2026
S. Mukhopadhyay, R. Baral*, N. Mahajan, et al. | ACL Rolling Review (ARR)*

- Benchmarked LLM reasoning via puzzle variations to expose memorization vs. true reasoning.
- Developed automated error classification achieving 96% human agreement.

CMT Bench: Cricket Multi-Table Generation Benchmark for Robustness in LLMs — Jan 2026
R. Upadhyay, R. Baral, N. Ahuja*, V. Gupta | ACL Rolling Review (ARR)*

- Developed a multi-table generation benchmark to probe robustness and data-tabulation logic in LLMs.

Technical Skills

Languages: Java, JS, Python, C, C#, OCaml, Rust, Kotlin, SQL, HTML, PHP, Ruby, R, MATLAB
AI & Data: PyTorch, Scikit-learn, NumPy, SciPy, StatPy, Pandas, BeautifulSoup, MongoDB
Tools: AWS, Git, VSCode, Android Studio, QGIS, ArcGIS, MobaXTerm, ImageMagick, GDAL

Experience

Arizona State University — Tempe, AZ
Graduate Project / Teaching Assistant — Aug 2024 – Present

- **SportsT2T:** Led an evaluation of GPT-4o and Gemini 2.0 Flash capabilities in transforming unstructured sports commentary into structured tabular data. Developed sophisticated prompts to accurately tabulate player statistics, focusing on the models' ability to handle complex, domain-specific terminology and multi-table formatting.
- **Information Assurance:** Performed a comprehensive security analysis for the healthcare industry by applying AI/ML techniques to identify systemic vulnerabilities. Evaluated information assurance protocols and predictive modeling to ensure data integrity and patient privacy within clinical and multimedia database environments.
- **Systems:** Architected and implemented a fully functional Distributed Hash Table (DHT) in Python to manage and retrieve NOAA weather records efficiently. Optimized data distribution, lookup latency, and fault tolerance to handle high-concurrency access to large-scale environmental datasets.
- **Instruction:** Serve as a Computer Science Lab Teaching Assistant, leading instructional sessions on JavaScript for undergraduate students. Responsible for grading technical assignments, troubleshooting full-stack code, and delivering comprehensive review guides to reinforce object-oriented design and programming principles.

Selected Projects

- **GIS & Image Processing:** Leveraged QGIS to process and analyze multi-spectral Landsat-8 and Sentinel-2 satellite data, utilizing color composites to identify geographical features. Developed data plots and high-resolution animations of Hurricane Idalia's motion using NOAA GOES-16E imagery and ImageMagick. Conducted advanced spatial analysis through ArcGIS to evaluate the proximity impacts and environmental damage of California wildfires.
- **AI/ML Architecture:** Engineered a custom neural network from scratch, implementing a robust backpropagation algorithm to tune network parameters on synthetic datasets. Developed a comprehensive transfer learning benchmark to evaluate model performance across diverse domains, including computer vision (CV), natural language processing (NLP), and multi-modal integration.
- **MicroCaml:** Architected and engineered "MicroCaml," a functional sublanguage of OCaml. Developed a full pipeline including a custom Lexer for tokenization, a Parser for abstract syntax tree generation, and an Interpreter to execute higher-order functions. Additionally simulated a regular expression engine and a tree-based database system using OCaml.
- **Full-Stack Dev:** Built a responsive, multi-screen weather application in Kotlin featuring real-time API integration, multi-language support, and Google AdMob monetization. Developed a high-concurrency order processing supermarket application using a JavaScript/Node.js backend, a modern HTML/CSS frontend, and a MongoDB database for scalable JSON data storage.