Raksha Ramesh

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EDUCATION

University of Pennsylvania   Philadelphia, PA
Master of Science in Engineering in Computer and Information Science   *Dec 2025*
Major: Computer and Information Science; *Concentration:* Artificial Intelligence   *GPA*: 3.88/4.0
PES University   Bangalore, India
Bachelor of Technology in Computer Science and Engineering   *May 2022*

WORK EXPERIENCE

Crum & Forster   Philadelphia, PA
Data Science Intern   *June 2025 – Sept 2025*

- Migrated 30+ high-traffic data science microservices from Pony ORM to a custom SQL context manager, resolving schema inconsistencies and validating parity through reusable checklists.
- Built OCR pipeline processing 5,000+ environmental supplemental applications with >95% classification accuracy using AWS Step Functions, LLM-based markdown extraction, and prompt engineering — reducing manual review time by 70%.
- Designed multi-environment deployment plan with smoke testing and zero-downtime rollouts, adding monitoring for error rates, latency, and cost to improve reliability and visibility.

Walmart Global Tech   Bangalore, India
Software Development Engineer II   *July 2022 – May 2023*

- Maintained 20+ mission-critical microservices for Walmart US e-commerce, supporting millions of daily transactions with high availability.
- Cut outages by 15% (~$15M savings) by implementing rate limiting across high-traffic services and presenting the initiative to 90+ engineers and leaders.
- Reduced incident resolution time by 40% by integrating OpenTelemetry distributed tracing into service workflows.
- Resolved 20+ P0/P1 incidents through coordinated follow-the-sun on-call rotations.

Software Development Intern   *Jan 2022 – June 2022*

- Integrated PowerSport Category vehicles into product catalogs, enabling targeted filtering and improving user journeys — increasing conversions by 10%.
- Built and maintained Grafana and Splunk dashboards for 5 microservices, accelerating issue detection and boosting uptime metrics.
- Led testing and deployment of two production services, collaborating with QA, product owners, and engineering to ensure smooth launches with minimal downtime.

Ellipses Innovation   Bangalore, India
Marketing Intern   *May 2021 – Aug 2021*

- Developed data-driven Instagram marketing strategy by analyzing engagement metrics and audience demographics — increasing follower growth by 35% and generating the company's first recurring sales (20+ orders/week).
- Conducted competitor benchmarking and market research to refine content mix, posting frequency, and optimal posting times, improving campaign engagement rates.

PROJECTS AND PUBLICATIONS

AI/ML & NLP PROJECTS

Segment Based Abnormality Detection in EEG Recordings   *Published in IEEE, Aug 2022*

- Achieved 90.78% classification accuracy (surpassing SOTA) for EEG abnormalities using Empirical Wavelet Transform (EWT), Recursive Feature Elimination (RFE), and Linear SVM.
- Evaluated multiple pipelines (EMD, EWT, k-NN, SVM, XGBoost, MLP) and optimized performance through iterative experimentation.

DreamBook   *Oct 2024 – Dec 2024*

- Built AI diary platform digitizing handwritten, audio, and text entries using Google Cloud Vision, Speech-to-Text, and Stable Diffusion (DreamBooth + LoRA) — producing consistent comic-style illustrations.
- Deployed Gradio interface for seamless uploads and real-time AI-generated outputs.

BART-to-Edge   *Oct 2024 – Dec 2024*
- Optimized mBART/M2M100 with LoRA and layer freezing, reducing GPU memory usage by 50% and training time by 30%.
- Enabled sub-1B parameter real-time Chinese–English translation on edge devices while maintaining BLEU score performance.

Lexical Simplification   *Feb 2021 – May 2021*
- Developed contextual word substitution pipeline improving text accessibility for diverse readers — reducing reading complexity scores by 20% and improving comprehension in testing.
- Used NLTK, gensim, and pandas for tokenization, synonym generation, and semantic ranking with part-of-speech tagging and frequency-based filtering.

Deep Learning for Text Summarization   *Feb 2020 – May 2020*
- Implemented both extractive and abstractive summarization pipelines to improve readability and reduce redundancy in generated summaries.
- Benchmarked with ROUGE and BLEU, showing abstractive methods improved semantic coherence while reducing repetition by 25%.

 DATA SCIENCE & ANALYTICS PROJECTS
Optimizing ANN for Learned Cardinalities   *Oct 2023 – Dec 2023*
- Tuned MSCN-based learned cardinality estimator in PyTorch, adjusting encoder–decoder MLP architecture for improved accuracy.
- Selected Adam + MLSE loss for smoother convergence, lowering median Q-error and standardizing experiment workflows.

World Development Indicators Analysis   *Aug 2020 – Dec 2020*
- Modeled macroeconomic growth using regression on World Bank WDI data, achieving RMSE of 2.7% (developed) and 4.3% (developing).
- Analyzed sector drivers to produce actionable contrasts for policy-focused interpretations.

YACS (Yet Another Centralized Scheduler)   *Aug 2020 – Dec 2020*
- Built master–worker scheduler in Python with sockets + multithreading, implementing Random, Round Robin, and Least-Loaded scheduling policies.
- Added map-reduce task dependencies and back-pressure controls to reduce idle CPU time.

 SYSTEMS & INFRASTRUCTURE PROJECTS
PennOS – Custom Operating System   *Jan 2025 – May 2025*
- Developed UNIX-like OS in C with FAT filesystem, multi-level feedback queue scheduler, and preemptive user-space threading.
- Created custom shell with built-in commands, process control syscalls, and concurrency-safe inter-thread communication.

Mini-Compiler for JavaScript   *Aug 2020 – Dec 2020*
- Created a compiler in **C** implementing **lexical analysis**, **syntax parsing**, and **semantic analysis** for a JavaScript subset.
- Generated optimized **three-address code** with constant folding and dead code elimination before emitting assembly-like output.
- Designed a **symbol table** with scope management and type-checking for accurate semantic validation.

Elevator Control System   *Jan 2020 – May 2020*
- Designed and implemented a C-based elevator control simulation using an **ordered doubly linked list** to maintain pending floor requests in priority order.
- Simulated real-time operations with direction-aware scheduling to reduce average wait times.

LEADERSHIP AND EXTRACURRICULARS
University of Pennsylvania   Philadelphia, PA
Head Teaching Assistant/ Product Manager   *Aug 2024 – Present*
- Directed product strategy for 5 cross-functional student teams, leading MVP development cycles through agile planning, user feedback loops, and stakeholder demos.
- Coordinated a team of 11 TAs, overseeing training, task allocation, and day-to-day operations to ensure smooth course delivery.
- Managed all course logistics — scheduling, grading workflows, resource planning — to support 100+ students and faculty.
- Conducted user research and usability testing to refine requirements, improving deliverable adoption rates.
- Managed timelines, budgets, and weekly stand-ups, evaluating 20+ product demos for quality and market fit.

U&I Trust   Bangalore, India
Chair – ACM-W - Student Chapter   *May 2022 – Jul 2023*
- Directed the English literacy program for **20+ underprivileged girls**, designing custom lesson plans to improve conversational and written fluency.
- Led volunteer recruitment drives, growing the teaching staff by 50% to meet demand.
- Spearheaded fundraising initiatives that fully covered annual program costs.

PES University   Bangalore, India
Chair – ACM-W - Student Chapter   *Aug 2020 – Jul 2022*
- Expanded chapter membership 4× through inclusive outreach and mentorship programs.
- Secured corporate sponsorships and VC funding for Women's Day Ideathon, supporting top 3 winning ideas.
- Organized 15+ workshops, hackathons, and speaker events promoting diversity in tech.

Event Lead / Organizer   *Aug 2019 – Jul 2022*
- Planned and executed national-level **technical and cultural festivals** attracting **10,000+ attendees** annually.
- Managed logistics, sponsorship acquisition, and vendor negotiations to run events on budget.
- Designed event schedules and marketing campaigns, increasing footfall by ~20% year-over-year.

SKILLS & INTERESTS
- **Programming:** Python, TypeScript, Node.js, C, GraphQL, Git, Postman, CI/CD, JIRA, Confluence, Tableau
- **AI & Machine Learning:** PyTorch, NumPy, pandas, scikit-learn, EWT, EMD, RFE, LoRA, DreamBooth, Stable Diffusion, BLEU, BERTScore
- **Cloud & Infrastructure:** AWS (CDK, Textract, Bedrock, BDA, Step Functions), Serverless Framework, Google Cloud Vision, Speech-to-Text, Kubernetes, Istio
- **Data Engineering & Observability:** SQL, Pony ORM, Grafana, Splunk, Prometheus, OpenTelemetry, Jaeger
- **Systems & Compilers:** FAT filesystem, multi-level feedback queue scheduler
- **Product & Collaboration:** Agile/Scrum, MVP development, user research, A/B testing