Kaushik Rajan, India

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Education

Masters in Computer Science *Aug 2015 – May 2017*
North Carolina State University, Raleigh, NC, USA
GPA: 3.63/4

Bachelors in Computer Science and Engineering *Aug 2009 – May 2013*
Vellore Institute of Technology (VIT) University, Vellore, India
GPA: 8.67/10

Experience

Origin Labs, India (Remote) - *Engineer/Applied Scientist* *May 2024 - Present*

Solo, bootstrapped startup (applied science business) scaled through agent-orchestrated workflows. Semi-automated system where multiple AI agents collaboratively digest AI/ML research, identify applicable techniques, and develop consumer applications for web and iOS deployment.

- Published **69** technical articles on Medium exploring deep reinforcement learning, multi-agent systems, game theory: **24,800** views and **9,400** reads.
- Developed **2 AI-powered iOS applications** leveraging vision-language models for real-world classification and document understanding: Smart Rock Identifier AI—integrates Google's Gemini 3 Flash VLM for zero-shot geological specimen classification with natural language explanations (**185** users, **252** sessions); Receipt Scanner AI—applies vision-language understanding for structured data extraction from unstructured document images (**60** users, **137** sessions). Both apps demonstrate end-to-end deployment of multimodal AI from model integration to App Store production.
- Created **2 web directories** consolidating AI tools through objective, systematic evaluation: AI Coding Tools (24+ coding assistants with evidence-based scoring, **6,500** views across **5,200** sessions) and AI PM Tools (project/product management tools, **1,600** views across **1,200** sessions).

Amazon, Arlington, VA, USA - *Data Scientist* *Sept 2020 - May 2024*

- Utilized econometrics, statistical and time-series techniques to forecast **~$50 billion** in Sponsored ads, Display, Video and Audio ad revenue to Amazon stores and digital teams. This was a CFO goal and the work involved heavy collaboration with multiple stakeholders – engineers (ML and software), senior economists, senior product managers and finance (directors and VP).
- Utilized quasi-experimental time series analysis (interrupted time series) to evaluate the causal impact of Prime Day on ad revenue forecasts. This was used to feed Prime Day as a "special event" to prophet for forecasting. This resulted in a **12%** increase in accuracy in the revenue forecasts (**$2MM** yearly impact to Prime Video revenue).
- Authored internal research publications and documentation on time-series forecasting, deep learning, and observational causal inference.
- Rated as a **top-tier scientist** achieving consecutive **"Exceeds High Bar"** ratings (2023, 2024).

EAB, Richmond, VA, USA - *Data Engineer* *Sept 2019 - Mar 2020*

- Designed and implemented an end-to-end data pipeline using REST API to fetch university student data to enable machine learning. Integrated with Slack API to establish an automated alerting system that notified engineers of pipeline disruptions. The system operated daily, processing **5-10 million rows** each day.

E3 Retail, Raleigh, NC, USA - *Machine Learning Engineer (Big Data Developer)* *July 2017 - Sept 2019*

- Implemented multiple regression and deep learning (RNNs with LSTM) models to forecast item sales (**~$250MM** in cumulative yearly revenue) across **15 retail stores** in the US and Asia Pacific region.
- Designed and implemented a Faster R-CNN object detection pipeline for automated retail inventory monitoring. Managed the full ML lifecycle: curated training datasets from store camera feeds, fine-tuned pre-trained backbone networks (ResNet-50 FPN), optimized anchor box configurations for shelf-level product detection, and deployed inference at scale. Achieved **95% mAP**, reduced manual inventory checks by **70%**, and generated **$2MM** annual savings by optimizing out-of-stock detection for an electronics retailer.

Interest Inc, Durham, NC, USA - *Research Analyst* *Sept 2016 - May 2017*

[Part time role with grad-school: 20 hours/week]

- Built a thematic investing algorithm outperforming market benchmarks by **15%** in pilot tests.

Inmar, Richmond, VA, USA - *Software Engineer Intern* *June 2016 - Aug 2016*

- Built regression models forecasting product sales across 21 US states (**$15MM** yearly revenue).

Deloitte, India - *Engineer (Business Technology Analyst)* *Aug 2013 - May 2015*

- Setup data infrastructure and automated pipelines to pre-process and store sensitive healthcare data. The data pipeline handled **~2 million** records at a daily cadence.

Academic and Research Experience

Evaluating performance of semi-supervised self-training methods on Yelp reviews

Grad school research (team) project with the department of Computer Science at North Carolina State University (NCSU)

- Assessed the impact of integrating supervised and unsupervised data through semi-supervised learning. Using Naive Bayes, Decision Trees, and Logistic Regression, we achieved a **92%** accuracy in distinguishing genuine from fake Yelp reviews, demonstrating the value of combined data approaches. [Link to research paper]

Publications

- **Rajan, K.,** & Arango, D. (2025). Multi-Agent AI: From Isolated Agents to Cooperative Ecosystems. [*Theoretical Computer Science eJournal; Games & Political Behavior eJournal.*]
- **Rajan, K.,** & Arango, D. (2025). Behavioral Multi-Agent Systems: Integrating Human Decision-Making into AI Cooperation. [*Theoretical Computer Science eJournal.*]
- **Rajan, K.,** Arango-Aramburo, S., & Arango, D. (2025). Beyond Rationality: Engineering Human-like Cooperation in Artificial Intelligence (AI) Agents. [*Games & Political Behavior eJournal. Also submitted to European Journal of Operations Research*]

Technical Skills

Core Research Competencies

- **Multi-agent Reinforcement Learning:** Deep RL (Policy Gradients, Value Decomposition), cooperative AI, and emergent communication.
- **Causal Inference & Explainable AI:** Structural Causal Models (SCMs), counterfactual reasoning, and observational causal inference for model interpretability.
- **Game Theory & Econometrics:** Mechanism design, incentive compatibility (Shapley values), and time-series analysis.

Generative AI & Deep Learning

- **Architectures:** Transformers (via Hugging Face ecosystem), CNNs, and RNNs/LSTMs for multimodal applications.
- **LLM & Agentic Frameworks:** LangChain, Semantic Kernel, AgentRL
- **Core Libraries:** PyTorch, TensorFlow, Keras API
- **Programming Languages:** Python, SQL, R