Pragneshkumar Rana (Birlasoft | Epsilon | IIT Madras)

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CAREER GOAL :

- Drive innovation & achieve substantial impact through data-driven solutions, leading to continuous growth & success.

PROFESSIONAL EXPERIENCE:

Company	Designation	Year
Birlasoft	Technical Lead	May'24 - Present
Epsilon	Data Scientist 2	Aug'21 - Apr'24
Elite Technocrats	AI Developer	Apr'21 - Aug'21
IIT Madras	Research Scholar	Jan'18 - Mar'21
Nishtha Automation	R & D Engineer	Jun'16 - Dec'17

- **Birlasoft:** (CoE & Pharma)
  - **Tech stack - Gen AI:** Python, SQL, LangChain, Autogen, CrewAI, Vertex AI, Ollama, Fast-API, GCP, Azure, RAG, Vector DB, BigQuery, LangGraph, LLMs, ReactJS, Tailwind, BigQuery, Docker, Kubernetes
  - **Skills:** Gen-AI, Multi-agentic Design, Fine-tuning, Deep Learning, Architecture Design & Implementation, Microservices, POCs, Presentation
  - **Project Details & Impact** :
    - Designed the architecture and implemented a chatbot for an internal website, leveraging multi-agents & RAG pipeline to enable efficient retrieval of classified documents.
    - Built a Text2SQL bot using a multi-agent and RAG framework for supply chain analytics, enabling data-driven insights and visualizations in ReactJS to enhance supply chain decision-making processes.
    - Developed a Gen-AI algorithm to identify secondary malignancy in cancer patients, achieving high recall and accuracy, and successfully deployed it as a microservice.
    - Designed a strategy to classify and prioritize established products (EP) for yearly review, using deep learning for classification and Gen-AI for reasoning, enhancing product review efficiency.
    - Deployed algorithms and microservices using robust CI/CD pipelines and modern cloud-native technologies like GCP, Docker, and Kubernetes.

- **Epsilon:** (Auto & Retail)
  - **Tech stack:** Python, PySpark, Dataiku, Oracle-SQL, Power BI, AWS, Docker, Sage Maker, Fast-API, Git, Data Pipelines (Airflow+ML Flow), Tensor-flow, PyTorch
  - **Gen AI**: LLM, Fine-Tuning (PEFT), RAG, LangChain, Vector DB, vLLM (Deployment) , LLaMA, BERT, GPTs
  - **Techniques:** Deep Neural Network, RNN, NLP, Transformers, LLM, Hugging Face, Regression (Linear, Logistic), SVM, KNN, Clustering, Tree , A/B Testing, CI/CD
  - **Skills:** Data exploration, Data analysis, Big Data, ML Models (Building, Deployment, Life Cycle Management), KPI Decisioning, Reporting, Documentation, Communication, Mentoring, Presentation
  - **Project Details & Impact** :
    - Developed and deployed personalized recommendation systems, increasing campaign engagement by 55% and revenue by 30%.
    - Built predictive models for diverse marketing use cases, enhancing efficiency and optimizing customer targeting strategies.
    - Delivered AI-driven systems for CSSR campaigns, achieving an 8% revenue lift (110M).
    - Fine-tuned and deployed LLaMA models for Email Subject Line Generation, serving $>$1K users with low-latency inference.
    - Created a LangChain-based BOT for automated data analysis and actionable insights.
    - Implemented reinforcement learning techniques to solve cold start problems in recommendation systems.

- **Elite Technocrats:** (Finance)
  - **Tech stack:** Python, Excel, MS-SQL, Git
  - **Techniques:** ARIMA, ARCH, GARCH
  - **Skills:** Requirement Gathering, Data Analysis, Financial Market, Machine Learning, Mentoring
  - **Project Details & Impact** :
    - Transformed algorithmic trading strategies into executable solutions, significantly enhancing back-testing capabilities for a leading Financial Institution.
    - Engineered and implemented a robust production-ready back-end, ensuring seamless execution of algorithmic trading and back-testing operations.
    - Led the development of real-time trading and back-testing POCs.
    - Implemented a stock trend prediction framework utilizing ARIMA algorithm, further enhanced by the integration of ARCH and GARCH algorithms to introduce volatility and refine prediction accuracy.

- **IIT Madras:** (Research)
  - **Tech stack:** Python, Excel, Git, LaTeX, Bash
  - **Techniques:** Tree-Based Methods, Clustering Methods, Multiple Linear Regression
  - **Skills:** Data Collection, Machine Learning, Research, Technical Writing
  - **Project Details & Impact** :
    - Collected ignition delay data (IDT) from experiments and renowned research sources, notably Stanford.
    - Developed a novel regression-based clustering algorithm that achieved an impressive 93% prediction accuracy.
    - Developed a dedicated IDT prediction software based on the above algorithm.
    - Published a research article in a top-tier journal, showcasing expertise in both technical and research domains.

- **Nishtha Automation:** (Automation - Vibration control & Predictive maintenance)
  - **Tech stack:** Python, Excel, C, Arduino
  - **Techniques:** Anomaly Detection, Decision Trees, Logistic Regression, Rule-based algorithm
  - **Skills:** Data Collection, Machine Learning, Failure (Data) Analysis, Diamond Manufacturing, Sensors
  - **Project Details & Impact** :
    - Conducted comprehensive data collection (of thermal & vibration sensors, operational and diamond parameters) from diamond manufacturing machines.
    - Performed failure analysis in the manufacturing process and derived insights from the collected data.
    - Implemented a machine-learning model to avert production failures in diamond manufacturing processes.
    - Collected data on machine parts, worn-out components, usage duration, and factors like weather, etc.
    - Recommended optimal timings for predictive maintenance to increase machine reliability.
- **Other Projects:**
  - **City Planning - Cell Tower Locations:** (Pilot Project)
  - **Tech stack & Techniques:** Python, Gurobi, Constrained Optimization, Mixed-integer linear programming
    - Implemented an optimal solution for city planning by strategically placing cell towers within budget constraints to maximize population coverage. Employed K-Means clustering for precise region segmentation and utilized Gurobi's Python-based solver for efficient mixed-integer linear programming, resulting in cost-effective tower placement.

ACADEMIC DETAILS :

Examination	Specialisation	Institute	Year	CPI / %
Post-graduation	MS by research (Interdisciplinary), Computational Mathematics & Mechanical	IIT Madras	2018-2021	8.65
Under-graduation	BE, Mechanical Engineering	GTU, Gujarat	2012-2016	8.51
Higher Secondary	GSHEB	Pravrutti Vidyalaya	2009-2011	81.25 %
Secondary	GSHEB	Pravrutti Vidyalaya	2008-2009	89.38%

TECHNICAL SKILLS :

- **Operating system :** Linux, Windows
- **Tools:** Git, Visual Code, LaTeX, Dataiku, DBeaver
- **Cloud:** Colab, AWS, GCP, Azure
- **Programming Languages :** Python, SQL, C++, Bash
- **Library:** Scikit-learn, TensorFlow, PyTorch, NLTK, OpenAI, Hugging face, LangChain, AutoGen, CrewAI

CERTIFICATION :

- LLM Certifications **(W&B, Deeplearning.ai)**
- Gen-AI with Large Language Models **(Coursera)**
- Generating New Recipes using GPT-2 **(Coursera)**
- AI with Deep Learning **(GUVI)**
- NLP with Deep Learning Python **(Udemy)**
- Divide and Conquer, Sorting and Searching, and Randomized Algorithms **(Coursera)**
- Fabric Analytics Engineer Associate (**Microsoft**)
- Multi AI Agent Systems with crewAI
- AI Agentic Design Patterns with AutoGen

Mathematics and DS courses at IIT Madras:

- Pattern Recognition & Machine Learning
- Object-Oriented Programming
- Numerical Linear Algebra
- Probability and Statistics
- Numerical Method & Scientific Computing
- Reinforcement Learning
- Numerical Optimization

WORKSHOPS ATTENDED:

- **"High Performance Computing Architectures Programming Models and Languages Algorithms and Applications BigData AI and Deep Learning"** held at IISc from May 27 to May 31, 2019.
- **"Mathematics for data science"** summer school organized by Indo-French centre for applied mathematics held at IISc from July 15 to July 27, 2019 **(With Scholarship)**.

AWARDS & ACHIEVEMENTS :

- Extra Milers Award, Epsilon
- Recipient of MHRD (Govt. of India) scholarship for post graduate study at IIT, Madras.
- Departmental topper in the Mechanical Engineering, GTU

PUBLICATION:

- **Pragneshkumar Rana**, Krithika Narayanaswamy, Sivaram Ambikasaran
  "A data-driven framework to predict ignition delays of straight-chain alkanes." Combustion Theory and Modelling 26.5 (2022): 943-967.