PRABUDDHA LAYEK

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PROFESSIONAL SUMMARY

Solution Architect – AI/ML, Senior Data Science Consultant, Chief Data Scientist

17+ years of experience as advanced analytics and data science practitioner (Natural Language Processing, Generative AI, Deep Learning, Machine Learning, Search and Recommendation Engine) in different domains including Banking, Insurance, Wealth Management, Media, Car Rental, Retail, Telecommunication, Information Services, Pharmaceutical. Total Experience 22+ years.

- ✓ Leading ML (Machine Learning) CoE(Centre of Excellence) team, Microsoft Business Unit, TCS since September-2022
- ✓ Part of Generative AI Core team, Data and Analytics, Microsoft Business Unit
- ✓ Part of AI/ML CoE team since 2012
- ✓ Chief Data Scientist, ADD Safety solution (advanced cognitive solution that enables automated intake, processing, analysis and reporting of safety cases(pharmacovigilance) for pharmaceutical customers). ADD Safety has won the award for 'Best Technical Implementation for AI' at the 5th Global Annual Achievement Awards for Artificial Intelligence.
- ✓ Worked as Head, Machine Learning CoE, AI Services Unit, Analytics and Insights Unit
- ✓ Reviewer of AI/ML based solutions being built in the AI services unit
- ✓ Experienced in mentoring and developing a team of data scientists
- ✓ Experience across data science project life cycle – Conceptual stage, Pre Sales, Proof of Concept, data exploration, feature engineering to model building, training and deployment
- ✓ Collaborate and communicate cross functional stakeholders for decision making

SKILLS

Data Science:

Deep Learning (Primarily NLP) – Generative AI(OpenAI), GPT 3.5, ChatGPT, Prompt Engineering, Langchain, Semantic Search, Siamese Network, Self-supervised Learning, Contrastive Learning, Active Learning, Transformer, Attention, BERT, GRU (Gated Recurrent Unit), LSTM (Long Short Term Memory), RNN, CNN, Word Embeddings – Word2Vec, GloVe

Machine Learning - Dimensionality Reduction, Feature Selection, Clustering/Segmentation, Regression, Classification, Logistic Regression, Decision Tree, Random Forest, Gradient Boosted Tree, Support Vector Machine (SVM), Hyper parameter Optimization, Association Rules, Sequential Pattern Mining, Recommendation Engine, Anomaly Detection (Local Outlier Factor), Multi Criteria Decision Making (AHP), LDA (Latent Dirichlet Allocation), CRF (Conditional Random Field), Explainable AI, Responsible AI

Optimization – Exposure to linear and non-linear optimization

Knowledge Graph – Exposure to knowledge graph embeddings

Big Data – Map Reduce**,** HDFS**,** Hive, Apache Spark, Pyspark, Delta Lake (Databricks)

Tools – Python(scikit-learn, numpy, pandas etc), R(Programming Language), SAS

Search Engine - SOLR

Deep Learning Framework – PyTorch

SQL Database – Oracle, Postgres

NoSQL Database – Redis (Exposure)

Cloud Computing – Azure (Exposure)

MLOPS – MLFLOW, Azure ML

Other:

Agile Development, Project Management, Team Management, Pre Sales, Mentoring

PROFESSIONAL EXPERIENCE – Selected Experience

[A] Solution Architect – AI/ML, Microsoft Business Unit, Centre of Excellence, Product Engineering – Tata Consultancy Services Ltd, 2012 – Present

Generative AI Core Team – Microsoft Business Unit

- Drive Generative AI Proof of Concept (PoC) for multiple customers starting from initial discussion with customers to PoC completion and presentation to customer
- Provide technical input to Pre-Sales Team
- Review various Generative AI offering Creation
- Participate in strategy meeting to grow Generative AI business
- Drive Generative AI Offering creation in LLMOps (MLOps for Large Language Model), AI Workbench

TCS MLOPS Cockpit – Microsoft Business Unit

- This offering enables customer to quickly deploy ML models in production using CI/CD pipeline and model performance monitoring (accuracy tracking. Data drift, feature attribution drift, performance monitoring when ground truth is available much later, Explainable AI, bias and fairness detection across multiple dimensions, slice and dice, identifying underperforming segment)
- Solution development is in Progress. PoC completed for one customer
- Designing, Developing and leading the solution team

TCS ADD Safety Solution –Under TCS ADD^{TM} Platform

- Advanced cognitive solution that enables automated intake, processing, analysis and reporting of safety case (pharmacovigilance)
- Designed and built multiple production ready components leveraging machine learning, deep learning, transfer learning, contrastive learning to extract and infer information from case narrative section
- Designed and built duplicate search engine

- Solution support both clinical and spontaneous cases.
- 40% efficiency gain in case processing effort
- Solution is currently live for multiple customers

Search Engine for a leading global information services company

- Search is a key component and gateway to host of products from business information services (BIS). All these products start with a business search where customer can enter business name, street address, city, zip code, state, phone number, tax id etc. in various combinations and then get a relevant list of businesses that satisfy search intention.
- Developed and implemented various components to improve data driven search re-ranking algorithm over existing business rule-based approach.
- 7% top match accuracy improvement over existing business rule-based approach.
- Converted loop-based business rule match score to matrix-based approach. This resulted in significant reduction of query execution time.

Customer Hackathon – Smart SDTM translator challenge
- Developed partial automation solution to convert clinical data from disparate source system data into Study Data Tabulation Model (SDTM) for regulatory submission.

Leaf Grader Toolkit for an international tobacco product manufacturer

- Automate tobacco leaf grading using computer vision and automatic speech recognition (voice of grading SME converted to text).
- Guided the team in covering various scenarios in training iterations of computer vision model to select best performing model and explaining those scenarios to customer's data science team

Data and Analytics Maturity Assessment – Under TCS DATOM™ Strategy Consulting

- Worked as senior data science consultant for an India based telecommunication company and delivered Data Maturity assessment across People, Process, Technology and Data with opportunity for improvement for their multiple business units.

CX Digital Transformation - Customer is multinational media conglomerate.

- Main driver of this program is to move sales online and increase renewals
- Worked as solution architect to design and implement renewal recommendation engine for small law customers
- Developed customer renewal journey using process mining. Main objective of this renewal journey analysis was to get insight and identify bottlenecks in the renewal journey.

Wealth Management use cases – customer is multinational investment bank and financial services company

- Hard coded variable weights used in an application to score investment opportunity for non-discretionary advisory accounts.
- Reverse engineered likely approach used and derived pairwise comparison matrix (AHP – Analytic Hierarchy Process) using constrained optimization.
- Internal research analyst publish article about investment ideas and these are accessible thru intranet. Analysed effect of readership on trade activity and studying the readership behaviour across different segments of financial advisors.

Media Demand Forecasting and Spend Scenario Planning-
Customer is multinational media and digital marketing communications company

- Led team to develop Spend Scenario Planning tool. Core functionality of this tool was to provide optimum GRP(Gross Rating Point) schedule to maximize the average awareness for a given week numbers for a given budget.

[B] Data Analyst, Tech Lead - Decision Technology, Customer: USA based car rental company, Tata Consultancy Services Ltd, 2006 – 2012

- Yield management is a decision-making system used to predict, vary and control product availability. Provided comprehensive analysis and insights on many use cases to improve quality of yield management recommendations.

- Improved checkin forecast by considering variability of expected checkin date at the time of checkout versus actual checkin date. This significantly improved supply side forecasting and improved overall yield management recommendations.

- Worked as Tech Lead for Yield Diagnostics application. This application allowed business user to evaluate various component of yield management system as well as to quantify value added by yield analyst thru manual updates of various of parameters like demand forecast revisions, supply adjustments, minimum starting idles, deletes, and shuttle parameters

[C] Module Lead/Developer, Multiple customers,
    Tata Consultancy Services Ltd, 2000 – 2005

- Worked as analyst to support Core Apps module of Oracle HRMS. This system stores data about employees, their work structures and their compensation and benefits.

- Worked as analyst to support Database Marketing and Analysis team with enhancement and maintenance of Customer Analytics Platform

- Worked as developer to enhance and support a banking product (ATLAS – international wholesale banking operations software, MPCT solutions). Worked in the funds transfer module

EMPLOYMENT HISTORY

Tata Consultancy Services LTD, July-2000 to till date
Current Work Location – Kolkata, India
Previous Work Locations – Mumbai (India), USA, UK

EDUCATION

- ➢ **Bachelor of Engineering, Electronics and Telecommunication Engineering Jadavpur University,** Kolkata, West Bengal, India   June-2000
- ➢ **WBJEE(West Bengal Joint Entrance Examination) Rank 57**
- ➢ **Cleared GATE -2000 (Electronics and Communication) with 97.8 percentile.**

Certification and Training

- PMP (Project Management Institute) certified in 2010, currently in Suspended state, will renew by Dec-2023
- Passed TOGAF 8 certification (however validity has expired)
- Databricks Partner Training – Solution Architect Essential, 2022
- Databricks Certified Machine Learning Associate, 2022
- SAS certified Advanced Programmer Using SAS 9.X
- Completed Financial Risk Management (FRM) course from Pristine Career, Mumbai in 2009
- Attended "Forecasting Using SAS Software: A Programming approach" from SAS, New York in 2007`