ASHISH PANCHAL

Analytics & Data Science at Money View | Graduate Student at Georgia Tech

Experienced analytics professional, with 6 years of work in designing and delivering Data science solutions, I have experience in leading and developing impactful projects in fast paced startup environments, with exposure to Fintech, Ecommerce, FMCG, Chemicals and furniture retail businesses. Primarily my research interest lies in Multi-Agent diplomatic AI systems and associated problems.

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EXPERIENCE

Money View, Bengaluru — *Senior Data Scientist - Credit Risk*

NOV 2021- PRESENT

Research and development of innovative Data Science solutions to create lending differentiators and policies to serve customers while minimizing delinquency loss. Implementing fraud detection models to detect possible identify theft and ensuring KYC compliance.

KEY PROJECTS

- Currently developing **Prime customer risk model**, to estimate possible risk level of good credit profile customers, constituting to **80%** of the **annual loan disbursals** at acquisition, using information from the historical loan account of past 24 months, across 36 categories identified by Experian and recent loan inquiries, along with customer demographic profile. Modeled with **XgBoost** and **isolation forest**, with **data imbalance fixing**. Found 12 prominent customer segments with initial customer profiling including, including segments such as education loan takers with lower risk and also associated higher risk with customers having commercial loans historically.
- **Fraudulent activities hotspot identification**: Designed and developed a **similarity identification module** for recent delinquent loan takers, with localization based on parameters, such as Office and residential street addresses along with location PIN codes, by projecting addresses as word vectors and calculating **vector similarity** and **geolocation proximity**. Reduced **30% risk** during fraudulent activity spike, by helping in identifying activity hotspot and customer profiling during December 2021 and Jan 2022.
- **Identity incompliance - Fraud detection model**: Created an active **Fuzzy name matching engine**, designed to identify possible credit fraud with usage of different KYC documents based on **probabilistic and rule-based** name similarities, trained to handle different Indian nomenclatures used across regions, gender, era, languages, and religions. Substantially decreased credit fraud, by identifying imposters.
- **Channel Partner Analysis pipeline -Xiaomi:** Created **end to end Data Analytics pipeline** to better understand Daily, Monthly and long-term channel **Risk, Disbursals** and **Customer Funnel**. Automated analytical reports and alerts using python to assist the business in understanding Customer Risk behavior, fraudulent activities, disbursal growth across disbursal cohorts, Employment, programs, and risk segments.

Georgia Institute of Technology, Atlanta — *Graduate Student - MS Computer Science: Major - Machine Learning*

AUG 2021- PRESENT

MS Student in the 6th best AI research Institute in the world, have completed the courses Reinforcement learning, Artificial Intelligence for Robotics and Data & visual Analytics.

KEY PROJECTS

Reinforcement Learning:

- Programmed a **multi-agent reinforcement learning system** using **Decentralized-QMIX** and **Centralized-PPO** algorithm over a 3p-v-3p Google football simulation, additionally postulated techniques for more stable and faster learning.
- Implemented **DQN agent** to successfully land a **lunar Lander in Open AI gym simulation**, studying impact of "Skip Step learning", "Target network" and "experience replay" in isolation on policy convergence to reduce instabilities in the DQN caused by Bootstrapping, off-policy function approximation and model less nature of the algorithm (Deadly Triad).
- **Successful Implementation** and Replication of research results from Richard Sutton's paper **"Learning to Predict by the Methods of Temporal Differences"**, including Repeated and single presentation learning. Casted doubt on Author's presumption of **random-initial weight convergence**, with empirical evidence.

Game AI : CS7632 (Fall 2022)

- Designed multi agent finite state machine in unity to control agents belonging to two teams to play prison dodge ball. States and actions were defined to create situation aware adaptivity among players, creating offensive and defensive play.

Machine learning for Trading: CS7646 (Summer 2022)

- Programmed a Trading strategy learner, based on 5 different technical analysis indicator using Q learning and Dyna-Q, to predict future trend and execute trade accordingly. The performance of Dyna-Q was found better than Q learning, however both these learners performed worse than manual baseline strategy.

Robotics: Artificial Intelligence Techniques

- Programmed a Drone to map the simulated jungle environment using **Online Graph-SLAM (Simultaneous Localization and Mapping)** and navigate it to extract the treasures while avoiding tree crashes, by finding a safe and optimal path dynamically, using the noisy and limited range sensor reading to detect the tree's relative locations and size, and therefore estimating safe steering angles and moving distance.
- Implemented a Warehouse assortment robot in a simulated environment, using **A-star** and **Dynamic Programming** to **Explore and Search** the warehouse for the prioritized packages, set at an unknown location, **Plan and Optimize** route to navigate through the warehouse and pick the packages with respect to set prioritization, along with avoiding slippery floors and unstable floors. Additionally **optimizing path** to deliver the packages in the warehouse to their respective allocated spaces.
- Implemented a **PID feedback controller** for **steady state navigation**, manipulating rpms of a simulated dual rotor drone and smoothly guide it to a target elevation and horizontal position and keep it hovering at the target for a specific time.
- Implemented a **particle filter to localize** a randomly wrapped revolving man-made satellite in a simulated solar system, estimated using noisy collective gravitation pull measurement of all the planets. Along with prediction and relative localization of moving base planet and successfully sending 10 part message in 300 days using direct laser communication.
- Programmed **Kalman filters** for actively localize meteorites falling in a meteor shower towards earth at different acceleration, in a simulated environment, with noisy relative position sensor data, and predicting the meteorites' position in next one tenth of a second. Additionally, automated a laser turret to prioritize, accurately aim and fire incoming meteorites before they hit the ground.

SKILLS

Machine Learning: Predictive modeling, Regression, Time series forecasting, Classification, Clustering, **Natural Language Processing:** Topic Modeling, Topic Identification, Topic Association, Content Based and Collaborative Recommendation System,

Reinforcement Learning : TD methods Q-learning, SARSA, DAYNA, MDP=dynamic programming, POMDP,SMDP, Monte Carlo Tree Search, Competitive and Cooperative MARL: QMIX, PPO, state/action approximation DQN, Tile coding, Options, Stabilization : Target network, Experience Replay

AI & Robotics: Localization and prediction : Histogram filters, Kalman filters ,palrticle filters, Motion : PID control, Search & Planning : A star, Dynamic programming, Mapping : Graph SLAM, Online SLAM. Microcontrollers and processors: AVR, Arduino, raspberry Pi, MEMS sensors.

Data Analytics: Exploratory Data Analytics, Hypothesis Testing, A/B testing, Funnel conversion analysis, Data Science solution Design, Al gorithm development, Visual Storyboarding, Web scrawling, Probability, Statistics.

Project Management: Project planning, People management, client and engagement management, Scrum master, Program management.

TOOLS

Python
R Programming
SQL(Spark, MySQL)
AWS EC2, Lambda, Redshift, S3

AWARDS

Star of the Quarter Award'20
Awarded by VP, Quantzig 2020

Super Star Award'20 Awarded by VP, Quantzig 2020

Spot Award'19 Awarded by HOD, Deloitte USI 2018.

Recipient AGIF Scholarship 2015-2016

Data And Visual Analytics

- Designed and developed and end-to-end **Social listening** based information summarization using **topic modelling** and **prediction** engine for **Crypto market**. The project aims to reduce price uncertainty by modelling external factors along with investor sentiment reflected on social networking platform, a primary source driving investment decision. Created on a multilayered model, from information extraction, topic identification and association, popularity and sentiment estimation and tunning boosting model for each currency with these parameters, along with macro-economic, industrial and price statics, over short-, medium- and long-term. Our experiments show that social listening has significant importance in not just predicting future price values but also has potential to increase awareness about ongoing/changing driving forces. An MSE of 0.04 was achieved by our price prediction model.

Quantzig, Bengaluru — *Senior Analytics Consultant: Data Scientist* JULY 2019 – NOV 2021

Translated business requirements into analytics questions and led development of end-to-end business solution pipeline. Delivered custom business solutions and improved existing industry accepted models to produce tangible results. Hired and mentored new team members and supervised multiple projects simultaneously, along with identification of Analytics growth opportunities.

KEY PROJECTS

- Designed and lead the POC development of **Demand Forecasting model** for Global Chemical giant, covering the **sales in APAC region**. **Outperforming SAP forecasting solutions** for 86% SKUs, with 0.1-2x improvement in Continuous demand Products, >3x in Intermittent Demand products. Identification and data gathering of impacting leading external factors covering Macro-economic parameters, Industrial factors, external event flag and internal sales of related products. Developed custom algorithm to identify the relationship between Demand and Identified factors, **overcoming the drawbacks of known correlation measures**. Designed **Probabilistic prediction model** for intermittent demand SKUs, alongside with **XgBoost and Ridge Regression** techniques to determine the relationship between Continuous demand SKUs and identified parameters
- **Developed Analytics Roadmap** for one of the biggest Furniture retailers in United States. Designed customized **Marketing Mix modelling** framework and **sales forecasting** leveraging time-series prediction model (SAMIRAX), integrated with Bayesian network and Bayesian regression, incorporating industrial events and econometric factors. The roadmap also included **hybrid product recommendation systems** and **customer segmentation model.**
- **Optimized keyword bidding** for a major FMCG brand on **ecommerce** platform by designing a Python based analytics framework to identify **trending consumer interests** and search trends on Marketplace. Also **predicted desired product features** that are not currently available in market to **guide future roadmap of the company**. This led to 3500X improvement in customer interest identification.
- **Identified consumer chatter themes** for specific market segment and event on social media by extraction of contextual information using Natural Language Processing, Apriori and Wu-Palmer similarity for classification. This solution increased the targeting efficiency for the client's marketing team.
- **Identified consumer pain points and interests** to help identify and prioritize improvement area in portfolio products, marketing pointers and unfulfilled market gaps with the help of modified TFIDF, Modified Apriori.
- **Identified potential product innovations in market segment** by creating a Python and Perl based consumer driven model that parsed user DIY ides, critic blogs and articles. Also identified priority of innovation by quantifying consumer acceptance from Marketplace and aided in marketing and content optimization. Built **recommendation system** to provide base product suggestions for innovation development.
- **Enhanced visibility on online Marketplace** and determined the effect of campaigns on list position and sales rank and developed visualization using Power BI for real-time monitoring. Also identified product wise top competitors and their visibility.
- **Analyzed communication/channel effectiveness and channel cannibalization** to identify potential cannibalization by sales representative on conversion of orders from various channels, using attribution modeling aided with Random forest classification. The architecture was based on Parquet+HDFS
- Developed a web tool on R Shiny for **Cost management and optimization for all SKUs**, with reactive visual simulator for identification of the best supply component combination. Cost change approval process can be monitored real time along with active logging material cost changes history. This solution aided the procurement team in negotiating costs with suppliers.

Deloitte, Bengaluru — *Advisory Analyst* JULY 2017 – JUNE 2019

Designed and build monitoring frameworks for cyber risk activities and global system performance of the firm. Delivered custom solutions for integration, management and automated optimization of high security apps and systems.

KEY PROJECTS

- **Analyzed key metrics and event logs to assess availability, reliability, performance and shortcomings in Okta systems to trigger alerts** in case of errors and assist in troubleshooting on the basis of dimensions such as device type, OS, geo-location, zone and date for MFA, SSO and Okta logins in order to make employee centric applications more intuitive.
- **Designed a Tableau based dashboard to study real time performance of Okta systems** that enabled application team to identify security concerns and improve efficiency of Okta systems. Also developed an overall schema-view with developers for a consolidated analytics data source to optimize dashboard performance
- **Designed and developed an algorithm to optimize segmentation** of application team by identifying top 10 applications in use. Bi-Variate analysis, Regression was performed to **determine the number of license required** in forthcoming quarters for Okta application. Cohort Analysis was performed on user categories to determine the number of inactive accounts with active license, to be reused for new employees. Also, automated deactivation of inactive users by integrating python script with Okta REST API.

Recommended for Officers Training Academy (Indian Army) All-India-Rank: **13**, October 2018.

Recommended for National Defence academy (Indian Army) AIR-107, Jan 2013

COURSES & CERTIFICATIONS

AI: Ethics and Society (2022)
-Georgia Tech, Course ID : CS6601

Machine Learning for Trading (2022)
-Georgia Tech, Course ID : CS7646

Game AI (2022)
-Georgia Tech, Course ID : CS7632

Robotics: Artificial Intelligence techniques (2022) – Georgia Tech
Course ID : CS7638

Data and Visual Analytics (2022) – Georgia Tech
Course ID : CS6242

Reinforcement Learning (2021) – Georgia Tech
Course ID : CS7642

Probability - The Science of Uncertainty and Data (2020) – MITx on Edx
Credential ID :
98c0ac7f8edc4f00a93049eb89447516

Machine Learning with Python-From Linear Models to Deep Learning (2020) – MITx on Edx
Credential ID :
1fa23ef5c6334fa09fbeab41d1e33da6

Data Analysis in Social Science(2020) – MITx on Edx
Credential ID :
3107a831609d4d8b8cd1a70f8f45602d

Fundamentals of Statistics(2020) – MITx on Edx
Credential ID :
10df9249eec44990a5662a3e7a37027b

Machine Learning (2019) - Coursera
Credential ID : JDZKFD5WAQJX

Academics and Military Training (2013-2014) - National Defence Academy

Army institute of technology, Pune – BE Project
JAN 2017 – JUNE 2017

Active web search assistance and home automation using Voice based Natural Language Processing:

- Developed Predictive and classification model based on **naive bayes multinomial classifier** for possible voice stimulus **with 89% efficiency** and created **Web based device and browser compatible**, user friendly visual and audio user interface.
- **Enabled voice interaction for Home appliances (IOT)** and multiple applications like Facebook and Gmail.

EDUCATION

Georgia Institute of Technology — *MS Computer Science - Machine Learning*

AUG 2021 - DEC 2023

Army Institute of Technology, Pune — *BE (Electronics and Telecommunication)*

JULY 2012 - JULY 2017

PUBLICATIONS

External Mechanism to prevent irreversible damage to hardware components of a cellular phone (2015)
IEEE, International Conference on Soft Computing Techniques & Applications

Mechanical Movement Aid to Nerve Damaged and Parkinson's using Pressure & frequency detection (2015)
IEEE, 4th International Conference on Communication and Signal Processing

Wired network services in mobile phones (2015)
IEEE, 2nd International Conference Electronics and Communication Systems (ICECS)