Aatika Sinha

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SUMMARY

- I am a well-organized, highly motivated IT professional with 5+ years of experience in aviation and banking, adept at delivering high-quality service under tight deadlines. Master's grad with a strong focus on troubleshooting and business & technical solutions. Fluent in English and Hindi, I work well in teams, thrive in challenging tasks, and am committed to exceeding expectations. Dependable and flexible, I am quick study and ready to expand (Head On!).

Education

- **The Pennsylvania State University** University Park,Pennsylvania,USA
  Master's of Engineering (ELIM): CGPA: 3.83/4.0, Minor: Business Analytics *Jan 2022 - August 2023*
- **Sikkim Manipal Institute of Technology** Sikkim, India
  Bachelor of Technology (Electronics and Comm Engineering) *June 2014 - June 2018*

Project Patents and Publications

- Airport Cooperative Research Program (ACRP Challenge) - A National level University Design Competition for Addressing Airport Needs with focus on Storm Water Management. Research Teams were setup strategically with the aim of working together to create solutions related to the Airport Operations. Involved in a team of 4 members which solved the problem based on Environmental Storm water management for "State College Airport" located in Pennsylvania. The project was in-depth analyzed quantitatively and qualitatively leading to be recognised Nationally as 2nd Runner-up throughout USA under "Airport Environmental Interactions Challenge". State College Airport's current drainage ditch system was inadequate at preventing pollutants from entering the environment, requiring external treatment from a municipality. To solve this, a team developed a new solution to better collect and treat water onsite and upgrade the drainage infrastructure. After thorough research, prototyping, stakeholder consultations, Risk Assessment, cost-benefit analysis among others; system's feasibility was confirmed. The improvements address pollution and water issues while offering economic benefits, especially for agricultural areas like State College.
  competition publish link 1: https://trb.org/ACRP/DesignWinners2022.aspx
  competition publish link 2: https://vsgc.odu.edu/acrpdesigncompetition/auto-draft

- Introduced "Taler", a practical payment system developed to balance accountability and privacy in electronic transactions. Unlike existing systems such as MasterCard and Visa, which enable mass surveillance, or decentralized systems like Bitcoin, which come with environmental and anonymity challenges, Taler operates on a protocol based on Chaum's design. The system addresses the issue of providing change efficiently by introducing a refresh protocol for divisible transactions with logarithmic costs. Its design prioritizes customer anonymity while ensuring transparency for merchants. The paper outlines Taler's key concepts, fundamental protocols, and correctness arguments, along with a freely available reference implementation. A comparative analysis with blockchain-based systems highlights Taler's cost-effectiveness and potential for stronger anonymity in ordinary transactions. The paper also discusses practical considerations, limitations, and real-world concerns, advocating for Taler as a secure, flexible, and privacy-preserving electronic payment solution. [Springer Publication]

- The Transformer model has revolutionized text data processing and shows potential beyond language tasks. Initially used for translation, it has proven effective in capturing mutations and building vocabularies, highlighting its capabilities. Although results may vary based on input data, the low evaluation loss supports the idea that NLP can benefit genetics. The next step involves combining Transformers with GAN networks to generate larger datasets for predicting and identifying new variants. With GANs already successful in creating biological sequences, this cross-disciplinary approach could lead to significant breakthroughs in understanding complex problems.

- This paper tackles the challenge of ranking noisy measurement data sets while accounting for ties, which can lead to non-transitive relationships and various valid ranking outcomes. It introduces three methodologies for partial ranking. The first generates a partial ranking with a flexible number of ranks, while the second refines this by reducing the number of ranks, addressing ties caused by overlapping and well-separated variants. The third methodology further optimizes the ranking, producing the fewest ranks possible. These approaches show potential in identifying performance differences among business process variants, demonstrated through the Purchase-to-Pay (P2P) process. This analysis provides a foundation for developing models that automatically differentiate process variants, even when performance metrics are unavailable. [In Progress]

- This paper examines how Virtual Health Assistance (VHA) technologies, including AI, Telemedicine, and Wearable Devices, can enhance healthcare for manufacturing workers in developing countries. With limited healthcare access and poor working conditions, these workers face higher risks of illness and reduced productivity. VHA offers a solution through real-time monitoring and remote consultations. The study discusses the technologies that enable VHA, the barriers to implementation, and its impact on worker health, calling for government support and policy measures to ensure successful adoption.

- ***Patent and Trademark***: Developed a daily use consumer product in the bathing segment in order to implement more hygenic way of using the Bodywash without a loofah. A loofah harbours bacteria and can cause skin rash or infections on skin which can be lethal on sensitive skin. The product is in process of launch and will be targeted towards more hygiene prone population among others. The product has been provisionally patented and Trademarked with USPTO under "Mio GelDispense".

Work Experience

- **Empire MG inc. - Prime Flight - Travelers Aid (PHL)** Philadelphia,PA,USA
  Customer Operations/Sales and Hospitality/Product Management *Dec 2023 - Present*
  - Business development and process improvement involving customer management/engagement leading to effective stakeholder and customer acquisitions, CRM through application monitoring, documentation and analytics.
  - Built a healthy and collaborative customer relationship along with the concerned stakeholders including TSA (Transportation Security Administration) officers, Police, aviation services, airlines etc. according to specific policies. Achieved the best contractual conditions while also ensuring customer satisfaction. Involved technical as well as managerial expertise to implement best operational practices, Tech savvy, critical thinking, problem solving, understanding industry trends, stakeholder collaboration strategy while analyzing and being aware of the competition. Support the development of Category Strategies which are robust enough to meet evolving business requirements.

- **TATA Consultancy Services - Product Development** India/USA
  Systems Engineer - Business/Data Driven Project *Jan 2022 - Nov 2023*
  - Identified which independent variables (over the data set) appear to have greatest impact on home valuation, and the nature of the relationship. Based on final model, gave forecast prediction and confidence intervals. Followed evaluating nature of data dependent or independent, putting data summary, scaling the limits of data summary, scaling variables for plots, Box plots for outlier Gap check, Scatter plots and interpretations, hypothesise the proposed regression model, developing regression model fitted coefficients, testing regression model predictive ability, performing validity checks on various parameters including independence of error, equal variance, normal distribution, checks for no unduly influential outliers et al. Further, characterising uncertainty and significance for regression model coefficients.
  - ***Impact***: Using regression model and based on provided data set it was found that the highest corrected median value of owner-occupied homes could be predicted between prices of 51,568 and 64,011, with 95% confidence. About 86% of the variation is supported by the regression model, so it can be used to estimate the trend in corrected median value of owner-occupied homes.
  - Characterised effectiveness of LDA, K-NN, neural network and logistic regression classification methods for predicting default as a function of the predictor variables student, income, and balance. Made a recommendation on whether any or all are useful. This was carried through evaluating nature of data dependent or independent, putting data summary, scaling the limits of data summary, scaling variables for plots,Box plots for outlier Gap check, Scatter plots and interpretations, hypothesise the proposed regression model, developing multiple regression model including the Linear, K-Fold cross validation, Gaussian process model, Neural Network model fitted coefficients, testing and compared regression model predictive ability, performing validity checks on various parameters including independence of error, equal variance, normal distribution, checks for no unduly influential outliers et al. Also, performing the SMOTE LDA classification as a solution for imbalance in the sample.
  - ***Impact***: Using regression model comparison it was found that LDA with SMOTE is recommended for predicting default as it can improve the recall and sensitivity of the model and it has more balanced accuracy, Informedness than the other models. Hence, recommend the LDA model as per the sample to the management for classification because its Accuracy is the highest of all which is 0.972 and its compute time is the least among all other methods which is 2.37.
  - Examined the SDGE (SanDiego Electricity) time series data and made a preliminary recommendation on best forecast approach for predicting hourly energy use one month in advance. Examined the double exponential (DEWMA) and double seasonal Holt Winters (DSHW) time series forecasting models in the SanDiegoElectricity through Creating DEWMA and DSHW Forecasting model, prepared accuracy measure on training data, analyse accuracy measures of error on training set followed by performing validity checks and interpretation.
  - ***Impact***: The RMSE, MAE, MAPE values in DEWMA model are:76893.95, 66567.42, 3468.472, respectively.By comparing with value below in DSHW model, it was found that DEWMA had a much larger uncertainty error in prediction. The RMSE, MAE and MAPE values in the DSHW model found :217.36,152.15 and 7.81 respectively. Leading to prefer DSHW time series forecasting method for predicting hourly energy use a month in advance for California ISO.

- Financial Data Analysis using the data on the production costs and profits over a 16 month period for a manufacturer with international customers using Power BI tool. Created dashboards using meaningful insights into the company's sales and financial position.
- Using the MS Excel Descriptive analytics and based on given data from an EduToy company Categorised the customers based on age and gender. Along with determining the spend amounts that fall in the top 20% of all transactions (in dollars). Also, determined the products that generated the sales revenue falling in the top 25% of all revenue contribution in the sample, reported the current inventory level, quantity of order and supplier of each of these best-selling products. The data was also used to find out the proportion of all given transactions that were conducted through the use of different credit card like American Express, Discover, MasterCard and Visa.
- Using Prescriptive Analytics involved in creating Excel Macros, VBA to create function helping to avoid repetitive tasks. Decision- making through solver for optimisation and transport/sales planning. Decision Analysis through Decision Tree construction driving the best possible route to follow in production sequence.

Systems Engineer - Developer— Client: Leading European/Indian Bank Nov 2019 - Jan 2022

- Spearheaded Web developments to form data (UI changes) used directly by customers, streamlining the submission process and reducing errors by 15%, leading to improved data accuracy and customer satisfaction.
- Comprehensive training initiatives in Java, DBMS, HTML, and CSS, ensuring seamless implementation through rigorous exit assessments, leading significant improvement in technical competencies.
- Streamlined the integration of CI/CD tools including Jenkins, Maven build tool, Apache Tomcat Server, and Bit bucket, streamlining the development pipeline and reducing deployment time.

- **The Pennsylvania State University - Product management/Development** University Park, PA,USA
  Administrative Assistant for Research and Development (AgScience) *June 2023 - Aug 2023*
  - Leveraged tech expertise to update and optimize the University's grant listings, resulting in a 28% increase in grant applications.Identified key performance indicators (KPIs) for the grant DB, resulting in 30% data errors reduction and improved data integrity.

Leadership/Consultation Projects - Project Management Jan 2022 - May 2023

- Developed and organised a data-driven go-to-market strategy for a new product, leveraging market research and competitor analysis to drive profitability; Mastered end-to-end project management, strategically designing workflow processes, collaborating stakeholders and effectively managing resources throughout various stages of implementation.

Teaching Assistant (TA) - ENGR501,BA411,EE420 May 2022 - May 2023

- Taught courses on Corporate Leadership (ENGR501), Fourier Optics (EE420) and Business/Industrial Analysis (BA411). Evaluated and arrayed comprehensive feedback on industry level product management.

Skills and Coursework

- **Tools**: C++, Core Java, HTML5, JS, JSON, Python,R,Oracle Sql, MSExcel, MsOffice,MSProject, Verilog,SDLC,ServiceNow, Six Sigma, Asana, Analytics,CAPSIM,Strategy, Operations and Management, Customer service, Management, CRM.
- **Coursework and tool**: Anaconda,Sql Developer, Eclipse, WinSCP,Probability and Statistics,Tableau, ProjectLibre, PowerBI, Mailchimp, Lasso, Plone,File maker, Adobe Illustrator, VBA.

Internship

- **Maven Silicon** Bengaluru, India
  Design and Verification Trainee *July 2018 - May 2019*
  - **VLSI Project**: Designed the AHB to APB bridge as an AHB slave which converts AHB transactions to APB transactions by implementing pipelining at the AHB slave interface. Thus, the bridge supports AHB burst transfers.Architected the block level structure for the Router design and verification.

- **Delhi Metro Rail Corporation** Delhi, India
  Industrial Intern *June 2017 - July 2017*
  - Real-time experience of working mechanism inside well established Indian Government metro operations including Signalling,Automated fare collection (AFC),fiber-optic transmission system (FOTS).

Awards and Extra-curriculars

- Nationally (USA) placed and acknowledged for the ACRP (Airport Cooperative Research Program) design challenge for implementing a solution based on "Environmental Interaction Storm-water management."
- Member of (ECSA)Electronics and Communication **Student Council (2016-2017)** in College
- Runner up award in Inter- Department **Chess** competition. Senior Co-ordinator in Annual university Fest "KAALRAV", among other high-school level recognitions.