

FIRM

Consultant to Soteria Company, LLC
2023 - present

EDUCATION

- Masters in Management of Innovation, University of Toronto
- Electrical and Computer Engineering, University of Toronto

AREAS OF EXPERTISE

- Data, Analytics and AI
- Project Management and Delivery
- Technology

YEARS OF EXPERIENCE

16 Years

REGISTRATIONS & CERTIFICATIONS

Management of Enterprise Analytics

EMPLOYMENT

- IBM, NY
2006 - 2008
- Ontario Public Sector Projects
2009 - 2010
- Accenture, Project Finance Team
2010-2011
- TELUS (Fortune 500 Telecom, Canada)
2011 - 2014
- Personal Startup in Retail and Media
2014 - 2015
- Bank of Nova Scotia (Scotiabank)
2015 - 2018
- RBC Royal Bank
2018 - 2021
- PayPal
2021 - 2022
- Dataiku (Services for Data, Analytics and AI)
2022 - 2023

TECHNICAL EXPERIENCE

Mr. Kulkarni has 16 years of experience in data, analytics and software engineering spanning across multiple industries. He has extensive experience in complex and large-scale projects in regulated industries such as Financial Services, Pharmaceutical, Insurance and Auto

SUMMARY OF EXPERIENCE

Mr. Kulkarni's relevant experience includes the following projects and activities:

- Battery planning and prediction - Top 5 Auto Manufacturer
- Fleet Vehicle (Truck) Predictive Maintenance - Top 2 Logistics Co.
- Fuel Efficient Fleet Usage Planning and Forecasting – RBC Royal
- Report on China's Covid Rebound - Comprehensive review of oil and commodities, transit, shipping, geospatial and satellite data using data science
- Semiconductor Plant Security and Operations – IBM
- Network Intrusion Detection and Threat Analysis - IBM and Cisco
- Telecom Infrastructure Congestion and Planning for Network Optimization – TELUS (Fortune 500 Telecom Canada)
- Account Take Over - Cyber Security – Scotiabank
- Banking Joint Security Operations Center Support - RBC Royal

RELEVANT AND RELATED EXPERIENCE

Transit Safety – Data and Analytics Integration

2023 - Ongoing

Provided risk and safety analyses using AI and Data techniques for detection of possible misfunctions of transit doors which can lead to hazardous situations; in addition, conducted research and analysis for alternative data sources for Hydrogen Fuel Safety Benchmarks

Mr. Kulkarni's Role: Analyst

- Performed advanced data analysis on Canary Logger data to identify potential hazards related to wrong door open events in a major North American Transit System.
- Utilized statistical probability and predictive modeling to categorize and analyze events for operational safety improvements.
- Efficiently combined 16 large datasets using high-performance computing, ensuring data integrity for detailed analysis in Python ecosystem (Pandas, Sci Py, Num Py, PyTorch)
- Delivered findings via a structured report, providing actionable insights to operational teams for enhancing safety protocols and preventing hazardous conditions.
- Researched and compiled available open data for Hydrogen fuel including in motion and at rest/refueling data to estimate types of potential hazardous events (ignition, leak, fire, and fatality), as well causes and lessons learned; created succinct presentation report for conducting Hydrogen Training workshop

Battery Planning and Prediction - Top 5 Auto Manufacturer

2022 - 2023

A professional services client (Top 5 Auto Manufacturer with HQ in Japan) wanted to understand their battery life prediction for Electric and Plug in Hybrid Electric Vehicles including battery outage, End Of Life (EOL), optimal charging conditions and battery performance. This information would be useful for large fleet managers (such as rentals and dealership)

Mr. Kulkarni's Role: Analyst

- Collected and cleansed extensive data on vehicle battery usage, including charging patterns, usage intensity, and environmental conditions, ensuring accuracy and reliability.
- Analyzed battery performance over time to identify patterns and anomalies in battery degradation.
- Developed predictive models to estimate battery lifespan based on various usage and charging scenarios, using machine learning algorithms to enhance prediction accuracy.
- Studied charging data to determine the optimal conditions for extending battery life, considering the impact of charging speed, frequency, and environmental factors.
- Analyzed data to predict potential battery outages, enabling proactive maintenance and replacement.
- Assessed how different driving conditions affect battery performance and life expectancy.
- Provided insights for fleet managers on effective battery management, including best practices for charging and maintenance.
- Created dashboards and reports to visually represent findings, making the data accessible to stakeholders.
- Collaborated with technical teams to offer data-driven recommendations for battery design improvements and charging infrastructure enhancements.

Fleet Vehicle (Truck) Predictive Maintenance – Top 2 Logistics and Shipping Company

2022 - 2023

A professional services client (Top 2 Logistics and Shipping Company) wanted to predict the types of repairs and maintenance needed for their fleet vehicle using initial diagnostics and conditions reported by drivers. Correct identification can reduce maintenance costs and also optimize labor by having right expert available. Lastly, this can also be environmentally friendly due to extending the vehicle's service life.

Mr. Kulkarni's Role: Analyst

- Gathered and organized initial diagnostic data and conditions reported by drivers, ensuring data quality for analysis.
- Analyzed patterns in the diagnostic data to identify common repair and maintenance needs.
- Developed predictive models using machine learning to forecast future maintenance requirements for initial diagnostics.
- Cross-referenced driver reports with repair records to validate and improve the predictive model's accuracy.
- Provided actionable insights to optimize labor scheduling by predicting the expertise needed for upcoming repairs.
- Created a maintenance schedule that prioritized repairs, reducing unnecessary maintenance and associated costs.
- Developed a tracking system to monitor the effectiveness of the predictive models in reducing overall maintenance costs.
- Worked closely with the environmental team to understand how predictive maintenance could extend the service life of vehicles, contributing to sustainability efforts
- Presented findings and recommendations in user-friendly formats to enable decision-makers to implement changes effectively.

Fuel-Efficient Fleet Usage Planning and Forecasting – RBC Royal Bank

2019 - 2021

RBC Royal Bank wanted to forecast the daily cash demand for ATMs and accurately supply the necessary denominations of currency in a fuel-efficient manner via its securitized vehicles. This task was vital as it directly impacted customer satisfaction and operational efficiency. Accurate predictions were necessary to ensure ATMs were adequately stocked, avoiding cash shortages or overstocking. This forecasting was complex due to varying factors such as ATM location, operating hours, and city-specific characteristics. The objective was to develop a predictive model that reliably estimated cash requirements, considering these diverse factors. This initiative not only enhanced customer experience but also optimized the bank's logistical and financial resources

Mr. Kulkarni's Role: Data and Analytics Specialist

- Analyzed historical ATM supply data to identify fleet and predict future needs.
- Developed predictive models to accurately estimate fuel requirements, minimizing waste and optimizing distribution.
- Utilized advanced analytics to evaluate the impact of factors like location and operational hours on fuel usage.
- Implemented strategies to enhance the fleet's efficiency, drawing from insights gained from data analysis and modeling.

- Collaborated with cross-functional teams to integrate data-driven insights into fleet rollout schedules.

Supporting RBC Capital Markets Report on China's Covid Rebound - Comprehensive review of oil and commodities, transit, shipping, geospatial and satellite data using data science

2018 - 2020

The overall purpose and context of the project was to analyze China's economic and industrial recovery post-COVID-19, with a specific focus on oil demand. This was achieved through the use of various data science techniques to track and interpret data related to transit, shipping, and oil consumption. The project aimed to provide a comprehensive view of how China was bouncing back from the pandemic, which is crucial for understanding global economic trends and making informed business decisions.

Mr. Kulkarni's Role: Data Analytics Leader supporting the project

- Employed GPS, AIS (Automatic Identification System), and other geolocation data, alongside satellite imaging, to analyze Beijing's recovery in economic activities and oil demand.
- Utilized Bayesian inference and Monte Carlo simulations to estimate COVID-19 infection rates in various Chinese provinces.
- Monitored and quantified major air pollutants to gauge Chinese industrial activity.
- Analyzed Chinese oil demand recovery, estimating significant increases in demand across different quarters of the year.
- Utilized real-time AIS data to monitor daily shipping traffic at major Chinese ports, providing insights into Chinese trade levels and recovery.
- Examined changes in traffic patterns, including shifts from public transit to personal vehicles due to COVID-19, using high-frequency data across major Chinese cities.
- Tracked real-time flight activity, assessing the impact on aviation fuel demand and analyzing trends in both domestic and international flights.
- Assessed geospatial analytics data to understand China's strategic oil stockpiling activities during the observed period.

Semiconductor Plant Security and Operations - IBM

2007-2008

IBM's Fishkill Semiconductor plant wanted to identify the locations of its highly sensitive chips and ensure that the plant was functioning normally at all times. The solution devised used RFID embedded chips in manufacturing crates which were then triangulated through the facility for identification of location. In addition, the RFID chip signals were used to estimate velocity of the manufacturing assembly line as it moved through the facility.

Mr. Kulkarni's role: Wireless Engineer

- Developed the system rollout plan and physically installed the RFID chips on manufacturing crates. Tested and verified the triangulation
- Built an algorithm to validate movement velocity using vendor documentation and setup the security and crate movement alerts for plant operators

Network Intrusion Detection and Threat Analysis - IBM and Cisco, CA

2007 - 2008

IBM and Cisco had put a new generation Wireless LAN network at their large physical locations. They wanted to ensure rogue Access Points and devices could not access the network. Moreover, they wanted to use the wireless network to identify any unauthorized devices in the site periphery.

Mr. Kulkarni's Role: Wireless Engineer

- Developed a Site Plan that mapped physical assets (wireless access points and devices) with physical spaces in up/down/sideways configuration so that the space had a 3D map
- Developed a software algorithm to identify new device mac addresses against whitelisted devices and triangulate rogue devices
- Prepared rollout and documentation for Cisco to roll out this as an added software to their WLAN Controller Suite of products

Telecom Infrastructure Congestion and Planning for Network Optimization – TELUS (Fortune 500 Telecom Canada)

2011 - 2014

TELUS is a Fortune 500 Telecom Provider based in Canada. TELUS had deployed its Fiber Optic based Set Top Box service TELUS Optik in its core markets in Western Canada. In order to ensure viability and growth of its newly launched service, TELUS needed to identify service metrics, users' preferences and ensure that the service was able to deliver best Quality of service and user experience.

Mr. Kulkarni's Role: Data Scientist

- Collected and analyzed massive volume (Terabytes) of data of network usage using the then cutting-edge Hadoop technology.
- Used Mahout Machine Learning to process massive scale of data and identified key user metrics including network performance, service usage and tastes/preferences
- Delivered massive scale recommendations for network to be integrated into production deployment of the Fiber Optic network-based services.

Server and Mobile App - Account Take Over - Cyber Security - Scotiabank

2015 - 2018

Scotiabank (also known as The Bank of Nova Scotia) provides banking services to millions of customers using its website and mobile banking app. Scotiabank wanted to ensure that only the verified customers were able to login to their banking website and apps. This required cybersecurity analysis of their backend server logs.

Mr. Kulkarni's Role: Machine Learning Engineer

- Built a software system architecture for real time Account Take Over detection. This system analyzed users' data from servers, patterns of access and other relevant information to predict whether the latest login attempt was legitimate/fraudulent
- Deployed the system in production setting to be integrated with Scotiabank's website and mobile banking login system.
- Achieved high accuracy in legitimate logging detection and thwarted 85+% fraudulent login attempts.

Banking infrastructure Joint Security Operations Center Support - RBC Royal Bank

2018 - 2021

RBC Royal Bank wanted to use white-hat testing strategies along with honeypot mechanisms to compare infrastructure attacks and security threat analyses.

Mr. Kulkarni's Role: Cybersecurity Analyst

- Created a database and reporting structure by compiling information available from bank's in-house (1st party) data, as well as 3rd party datafeeds such as dark web catalogs.
- Build visualizations and reporting to present real time threat posture for senior management
- Created planning, forecasting and training for new Cybersecurity Center Analysts to leverage the new process

SPECIFIC AREAS OF EXPERTISE

- Data Analytics and AI: highly specialized expertise in data, analytics and AI
- Analysis Ecosystem: Python, Sci-kit learn, Pandas, MATLAB, R, Tensorflow, Pytorch, Bash Shell
- Processors: X86, PowerPC
- Operating Systems: Window, Linux, Unix
- Networking: Specialty in wireless telecommunications including Wireless LAN: 802.11a/b/g/n/ac
- Wireless Protocols: ZigBee, ZWave, Bluetooth, LoraWAN
- Embedded Systems Development: Networking Equipment, Set-top boxes, Wireless Routers, Internet of Things (IoT) products
- Virtualization: VMWare, VirtualBox
- Bug Tracking Software: JIRA, Bugzilla
- Source Control Software: SVN, CVS, Git
- System Integration and Test: Software Verification & Validation
- Project & Product Engineering Management: Microsoft Project, Jira, Asana
- Large Scale Compute: Yaml, Docker, Kubernetes, Spark, Hadoop