

## THAPASYA MURALI

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### WORK EXPERIENCE

University of Rochester

01/2023 – Present

#### Graduate Research Assistant

- Engineered a bash (**SLURM**) script that seamlessly integrated over 3 university and lab servers, **reducing processing time by over 10 hours** while building a seismic data pipeline and preparing source-to-target mapping.
- Leveraged **AWS Lambda, S3, and RDS in an ETL pipeline**, hosted on a Linux cluster within a university server environment.
- Orchestrated the creation of an ETL pipeline on a university server, significantly decreasing processing time by more than 10 hours using parallelized job execution in bash/shell scripts.
- Reconfigured the **Wasserstein GAN** with **Markov Chain Monte Carlo** model in **MATLAB** to generate synthetic 2D oceanic data from a dataset spanning over 500 Pacific stations over the last 20 years.
- Trained a lung ultrasound centric [convolutional network for video classification in lung ultrasound](#), achieving an impressive 85% training accuracy using **TensorFlow & Jupyter notebook**.
- Innovated the **convolution network** architecture by incorporating class-activated map (CAM) weights from a prior VGG-16 variant model, resulting in a remarkable increase in **precision up to 83%**.

#### PayPal

03/2020 – 07/2022

##### Backend (Kafka) Engineer

- Constructed a **Kafka-based data pipeline** for risk and fraud with geographically select feature release, revamping transaction checkpoints and rule sets.
- Partnered with mid to large clients to oversee and troubleshoot the **eBay and PayPal** transaction lifecycle.
- Vigilantly monitored and optimized **Kafka cluster** configurations by applying patches and feature releases, ensuring scalability and high availability.
- Implemented data processing pipelines using **Kafka Streams** to integrate developer APIs and production logs for real-time analytics and transformations.
- Engineered and streamlined the dispute filing experience for cryptocurrency for funding instrument, resulting in a **20% increase** in customer satisfaction ratings.
- Revamped the dispute resolution developer experience, **saving 6-9 hours per week** through **React-based pattern updates** and architectural migration, earning positive team feedback.
- Collaborated across teams to develop a merchant-centric experience with a projected annual **profit increase of \$20-25 million per annum**.
- Managed product and feature releases using **Jenkins** and monitored their initial adoption and performance using **Looker**.

RedBlackTree Technologies, India

08/2018 – 08/2019

#### Software Engineer

- Engineered an API platform in Flask, elevating delivery time window prediction precision by approximately 40% for the logistics team serving the e-commerce sector.
- Constructed a user-friendly Frontend using Angular 6 and Bootstrap, facilitating document display, key term highlighting, and user-driven document categorization, thereby training a **neural network** for unsupervised clustering.
- Developed RESTful APIs in **Django** to enable efficient document searches and JSON data provisioning.
- Implemented a serverless architecture with **Firestore** cloud functions to seamlessly deliver data to Android and iOS mobile apps as well as the website.
- Devised and optimized serverless API endpoints on **Google Cloud to minimize bandwidth usage and network requests**, ensuring functionality in rural areas with limited cell service connectivity for our mobile apps.
- Engineered a comprehensive React-based admin portal, empowering administrators to manage the platform on behalf of smartphone-lacking farmers.
- Spearheaded a team of three junior engineers delivering a full-stack architecture in the **JS & SQL stack** with seamless integration of WePay payment processor.
- Orchestrated the deployment of **Docker containers** through **Jenkins** for staging and production environments.
- Integrated third-party APIs for streamlined automated third-party ecommerce ordering processes for amazon, BestBuy, etc.
- Developed the serverless backend support in **Firebase** for a non-profit app that provided farmers with an online marketplace, offering mobile and admin web app support.
- Managed a team of three engineers to successfully deliver a crowdfunding app built in the JavaScript (React, NodeJS, SQL) stack, complete with an automated e-commerce ordering system.

**Software Engineer**

- Revamped the business logic in .NET and updated the front-end to Angular 2+, **resulting in a 45-50% improvement in processing time** for a dining and table reservation management.
- Configured and maintained the messaging queue in MS Azure jobs to meet the operational needs of the dining and reservation application, enabling communication over TCP/IP.
- Assessed the initial requirements for a dining & ordering platform and redesigned the backend architecture to deliver APIs for web and mobile applications integrating event queuing and streaming through MS Azure messaging services.
- Developed front-end components using Angular 1.x for dining & table reservation management onboarding up to 4 well established local business.
- Led the migration of the user interface to Angular 2, implementing a modular pattern & mentoring a team of QA engineer, web developers.
- Orchestrated the integration of up to three client applications with a backend framework in .NET and MS SQL Server.

**PROJECTS****Covid-19 case prediction model comparison**

- Analyzed performance of different regression models & neural network using evaluator metrics R2, RMSE.
- Performed **feature extraction** based on independent variables by number of case predictions using ensemble **modeling** and tested result using prediction metrics.
- Developed a data processing pipeline implementing **feature extraction** for high correlation variable, **outlier detection** using **z-score**, linear data interpolation & **normalization** producing **R2 score of 88% over 30K** epochs.

**Russia-Ukraine conflict data mining & forecast model comparison**

- Developed data scraping and interpolation pipeline from sources such as excel, xml & csv to compile over **7,000+ longitudinal data points** across 8 countries comprising of global commodity.
- Investigated correlation between commodity prices & Russia-Ukraine conflict, energy crisis using **scikit-learn**, **Matplotlib** packages on **Jupyter/ Colab**.
- Derived time series based quantitatively same results with seasonality-based forecasting & prediction model (**multi-linear regression**).

**Tweet Classification of North European Politicians**

- Compared topic modeling techniques (NMF, LDA) classifying tweets based on unsupervised topic clusters.
- Achieved accuracy of 77% using multi- & single feature input variable to classify tweets to political views.

**NYC bike trip forecasting**

- Constructed an ETL pipeline ingesting hourly bike trip data used for NYC bike trend on **Databricks Spark**.
- Streamlined data pre-processing tasks involving **data imputation**, **feature selection** & stored processed data in **Deltalake** for data warehouse.
- Built a forecasting model for bike trip and station capacity across NYC with real time data using **PySpark** supported packages such as **Pandas**, Facebook's **Prophet**.

**EDUCATION**

**University of Rochester**, Rochester, NY  
Master of Science, **Data Science**

[*anticipated*]2023

**SKILLS**

- Cloud Packages & tools: Tableau, RStudio, PyTorch, Heroku, JIRA, AWS Lambda, S3, Athena, CloudTrail