SUBBULAKSHMI SANKARAN

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# PROFESSIONAL SUMMARY

* Machine Learning Engineer with 3+ years of expertise in AI/ML and over 7 years in software engineering, specializing in deep learning, neural networks, and predictive modeling.
* Specialized in developing and deploying machine learning solutions across healthcare, finance, and social media domains, utilizing NLP and computer vision techniques with frameworks like TensorFlow, PyTorch, and OpenCV.
* Proficient in programming languages, including Python, C, C++, and SQL, with hands-on experience in cloud technologies such as AWS EC2 and SageMaker for scalable ML deployments.
* Experienced in fine-tuning advanced models like FLAN-T5 for dialogue summarization and leveraging transfer learning techniques to optimize model performance.
* Adept at building and deploying AI/ML models with strong functional, unit, and system-level testing expertise to ensure software reliability.
* Skilled in data analysis and visualization tools like Scikit-learn, Pandas, Matplotlib, Seaborn, and Tableau, driving actionable insights from complex datasets.
* Passionate about utilizing distributed systems, generative AI technologies, and advanced algorithms to support data-driven decision-making and improve operational efficiency.

**TECHNICAL TOOLKIT:**

* **Programming Languages**: C, C++, Python, SQL
* **ML Frameworks & Libraries:** TensorFlow, Keras, PyTorch, OpenCV
* **NLP libraries:** Spacy, NLTK, Regex
* **AI & ML**: ML algorithms like Linear Regression, Logistic Regression, Random Forest, XGBoost, Clustering algorithms, Deep Learning, Natural Language Processing, Recommendation Systems, Transfer Learning, Generative AI
* **Data Analysis and Visualization tools**: Scikit-learn, Pandas, NumPy, Matplotlib, Seaborn, Plotly Express, Tableau
* **Cloud Technologies**: AWS EC2, Sagemaker
* **Databases**: MySQL
* **Version Control:** Git, Rational ClearCase
* **Tools & Platforms:** Docker, Anaconda, Jupyter Notebook, Google Colaboratory
* **Protocols:** SIP, MGCP/NCS, HTTP, DHCP, SDP, RTP, RTCP, TCP/IP
* **Testing & Quality Assurance**: Functional Testing, Unit Testing, System-Level Testing
* **Operating Systems:** Linux, Android (KitKat/Lollipop)

# PROFESSIONAL EXPERIENCE

**MEGALABS AI |** Palo Alto, CA / USA

*Machine Learning Engineer (Feb 2021 – Present)*

* Utilized zero-shot and few-shot inference with the FLAN-T5 model for dialogue summarization and fine-tuned the FLAN-T5 model using PEFT (Parameter-Efficient Fine-Tuning) techniques to enhance model performance. Evaluated the results using the ROUGE metric, demonstrating improved summarization quality.
* Developed an ML model to detect Autism Spectrum Disorder (ASD) using facial landmarks extracted with MediaPipe and Dlib. Utilized 2D facial landmarks from Dlib and 2D and 3D landmarks from MediaPipe. Employed Hyperopt for hyperparameter tuning to select the best-performing model for classifying input images as containing autism indicators.
* Implemented a churn prediction project for Robinhood, conducting extensive exploratory data analysis to derive the output variable based on customers' equity values. Built and evaluated various classification models to predict churn and identified key features contributing to customer churn, providing actionable insights to improve user retention.
* Spearheaded the development of an AI healthcare application using ML models on AWS EC2, achieving 85% accuracy, improving diagnostic precision by 90%, and reducing manual assessment time by 80% for elderly patients. Deployed the final model using Flask API on an AWS EC2 instance, enabling real-time predictions.
* Leveraged item-based collaborative filtering to develop a personalized food recommendation system, resulting in a 20% increase in company revenue.
* Implemented advanced social media content filtering for the Wowso App by preprocessing tweets, applying TruncatedSVD for dimensionality reduction, and building optimized tweet classification models using Logistic Regression, Random Forest, and XGBoost, resulting in a 25% increase in user engagement.
* Conducted AI-powered skill gap analysis and enhanced resume improvement tools by exploring Doc2Vec for embedding job descriptions, applying KMeans clustering to group similar roles, utilizing Top2Vec to group job descriptions by topics, and comparing the outputs of both approaches to evaluate their effectiveness.
* Analyzed bank customer data using Python and Scikit-learn, applying K-Means clustering to segment customers for a targeted term deposit campaign, improving engagement and success rates. Visualized customer segments with Matplotlib and Seaborn to provide actionable insights.
* Developed an unsupervised text analysis solution for consumer complaints in the Telecom domain using NLP techniques such as text preprocessing, TF-IDF vectorization, and topic modeling with Gensim (LDA, NMF). Assigned topics to complaints for better categorization and actionable insights, improving the efficiency of complaint resolution workflows.
* Designed and implemented a video annotation tool using OpenCV and Python, enabling efficient labeling of balls in broadcast videos, significantly streamlining the annotation process for machine learning dataset preparation.

**GLOBAL EDGE SOFTWARE LIMITED |** Bangalore, KA / India

*Senior Technical Lead (Dec 2013 – Dec 2017)*

* Led the development of IMS Device Framework to support VoLTE per IR.92 specifications, implementing features like offline supplementary services, AMR open offer, and emergency call handling.
* Optimized registration error handling (RFC 5626), and VOPS indication management, and developed solutions for re-registration failures during active VoLTE calls.
* Integrated RTCP-XR support in IMS client and implemented silent retries for SS requests over CS when XCAP APN fails.
* Enhanced conference scenarios and supported R12 enhancements, including preconditions, supplementary services (SS), and Timer N.
* Designed and implemented Rich Communication Services (RCS) features for VoLTE mobile solutions compliant with Joyn Blackbird V3.0, including:
  + Enhanced group chat functionality with ad-hoc participant addition and one-on-one to group chat conversion.
  + Developed multi-device support and message caching for RCS clients.
  + Implemented file transfer capabilities with resume/cancel features and designed participant composition management in group chats.
  + Implemented handling of race conditions for one-on-one chats per RCS 5.1 specifications.
* Performed unit testing using Intel’s UT framework and functional testing with Python automation scripts.
* Drove high-level and low-level design of Intel’s VoLTE and RCS client features and streamlined optimization of those features, reducing call drop rates by 5% and amplifying user engagement by 20% across major global providers, including AT&T, T-Mobile, Jio, and Reliance.

**SAMSUNG R&D INSTITUTE |** Bangalore, KA / India

*Technical Lead (Prev: Lead Engineer) (May 2011 – Aug 2013)*

* Developed and enhanced IMS/VoLTE features, including the integration of the AKA mechanism for key generation and secure authentication.
* Implemented Call Hold, 3-way conference, Precondition framework, and Communication Diversion Notification (CDIVN).
* Developed subscription support for the reg event package and optimized the SIP Stack module, resolving critical issues.
* Contributed to core IMS functionalities such as registration processes and 3GPP MMTel implementation.
* Supported supplementary services, including Call Waiting, Call Transfer, Call Swap, and Communication Diversion, ensuring compliance with industry standards.
* Utilized the PC-Client solution, a Windows-based simulator, to develop and test new VoLTE and IMS features, ensuring robust feature implementation and improving overall testing efficiency for global mobile operators.

**MOTOROLA MOBILITY |** Bangalore, KA / India

*Software Engineer (Nov 2008 – Jan 2011)*

* Optimized the NCS signaling module for the Surfboard VOIP cable modem, improving audio quality by 10%. Addressed key DHCP issues, enhanced endpoint line status indicators, and contributed to faster data transmission and reliable phone service.
* Owned end-to-end feature development, implementing unit and system tests that achieved 88% code coverage and reduced post-release defects by 20%.
* Minimized memory leaks, boosting modem performance and significantly reducing call drop rates, improving overall system reliability and user experience.
* Implemented a prototype for the Topology Hiding feature, enabling session and header-level privacy for all outbound messages while ensuring accurate mapping of inbound messages. Enhanced security for mobile operators by preventing the exposure of network equipment addresses outside their network, reducing vulnerability to external attacks by 30%. Managed end-to-end project activities, including requirement gathering, high-level and low-level design, and conducting unit and system testing, ensuring seamless integration and operational reliability.

# EDUCATION & OTHER

**Liverpool John Moores University, UK**

*MS, Machine Learning and Artificial Intelligence (2021 - 2022)*

**Anna University, India**

*B.E. in Electronics and Communication (2002 – 2006)*

# OTHER EDUCATION:

# *Oracle Cloud Infrastructure 2024 Generative AI Certified Professional*

# *Generative AI with Large Language Models from DeepLearning.AI*