

## NIVEDHA BALAKRISHNAN

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### TECHNICAL SKILLS

**Languages:** Python, SQL, R, MATLAB, MongoDB, C, C++, C#, HTML, CSS, JavaScript.

**Tools and Technologies:** Scikit-Learn, Keras, TensorFlow, PyTorch, Hugging Face, LangChain, Flask, AWS, GCP, Tableau.

**AI Techniques:** Statistical Models, Machine Learning, Deep Learning, NLP, Transformers, Generative Models.

### TECHNICAL PROJECTS

#### A Transformers Insight: Discovering Sentiments in Dating App Reviews ([GitHub](#))

*Harnessing the power of cutting-edge NLP techniques & transformers to understand the sentiment behind dating app reviews.*

- Implemented **Vader** sentiment analysis and the **RoBERTa** transformer model to identify the sentiments in the reviews.
- Developed a Q&A bot using **LangChain** and **GPT-3.5 Turbo** model to interact with reviews and extracting insights for a deeper understanding of user perspectives.

#### Generative Dialogue Summarization: Insights for Enhanced Service and Satisfaction ([GitHub](#))

*Revolutionizing customer service-client dialogue summarization using the FLAN T5 model for enhanced efficiency and insights.*

- Utilized hugging face's **FLAN-T5** model to enhanced dialogue summarization on **AWS Sagemaker**.
- Directed the model using **prompt engineering** techniques, optimized it using fine-tuning techniques **LoRA/PEFT** and evaluated performance with **ROUGE** metrics for targeted summarization.

#### MLOps driven News Article Search Relevancy with SBERT ([GitHub](#))

*An End-to-End ML Ops project using SBERT transformer model to enhance news article search relevancy.*

- Developed an advanced search algorithm utilizing **SBERT** and **ANNOY**, seamlessly integrated it on **GitHub**, and **deployed** it on **AWS EC2** via a docker container for optimal performance.

#### Building a Comprehensive Analytical Ecosystem on AWS for E-commerce ([GitHub](#))

*Developed AWS data pipeline for real-time website intrusion detection and continuous monitoring.*

- Developed and deployed **end-to-end ETL** (Extract, Transform, Load) **data pipeline in AWS** using S3, Apache Flink, Kinesis, DynamoDB, Glue, Lambda, and SNS ensuring highest level of security.
- Created a dashboard using **Tableau** to deliver **real-time insights** that drive informed business decisions.

### WORK EXPERIENCE

#### San Jose State University | Graduate Research Assistant (Jan 2022 - Present) ([GitHub](#))

*Research project using ML to discover new drugs to treat thrombosis (Accelerated the process by 10-15 years).*

- Phase 1:** Developed and deployed a **ML pipeline** utilizing **Google Cloud Platform** (GCP) to identify and predict anti-thrombotic peptides and their corresponding inhibition constant respectively.
  - Tested model with 10M peptides, refining 50k hits through clustering and docking resulting in 21 peptides.
  - Utilized Google Cloud Platform's **Cloud Run** to containerize and integrate the model into the [website](#).
- Phase 2:** Leveraging Protein language models such as **ProtTrans** and **ProtBERT** for feature extraction (embeddings) with the goal of creating informative attributes from the dataset.
  - Fine-tuned** the transformer models using our dataset to optimize performance.

#### Integrum AB, Sweden | Graduate Intern (May 2019 – Jan 2020)

*Worked on an AI-based new therapeutic product to reduce Phantom Limb Pain for amputees.*

- Developed a **ML model** to predict hand movements from EMG signals obtained from amputees, utilizing features extracted from EMG signals through signal processing techniques in **MATLAB**.
  - Optimization resulted in **8% improvement** in the model performance.
  - Implemented these changes to the **product design** using **C#** for improved functionality.
- Investigated the distinct characteristics between different hand movements using **K-Means Clustering** algorithm.
  - Assisted in establishing effective therapeutic procedures based on the insights.

#### Cognizant Technology Solutions, India | Computer Programmer (Jun 2016 – Jun 2017)

*Assisted with healthcare insurance **website development** to enhance customer experience.*

- Developed and tested front-end components of the website using HTML, CSS and **JavaScript** while ensuring seamless integration with back-end systems.

### EDUCATION

#### San Jose State University

Aug 2023

Master of Science in Data Analytics (Awarded [Academic Scholarship](#))

#### Linköping University, Sweden

May 2020

Master of Science (Master Thesis in Artificial Intelligence)

#### Anna University, India

May 2016

Bachelor of Engineering (Awarded [Best Outgoing Student of the Year 2016](#))

Received **Patent from Intellectual Property India** for an innovative product *Nylon Fabricated Bone Immobilizer using Rapid Prototyping* in the field of orthopedics.

### VICE PRESIDENT (Ex-PRESIDENT) of the Machine Learning Club at SJSU

*Engaged actively in the ML club for two years, offering support and **mentorship** to students towards their long-term goals.*

- Conducted **ML hands-on sessions** for students, covering beginner to advanced topics.
- Collaborated with other officers to plan and **organize** events for the club.