SFU
SIMON FRASER UNIVERSITY

Animesh

Master of Engineering
Engineering Science
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Education

Degree	Institute	Year
Master of Engineering	Simon Fraser University, Burnaby	2021-2022
Bachelor of Engineering	Sri Siddhartha Institute of Technology, Bangalore	2010-2015

Experience

- **Binary Stream Software** | *May. 2022 - Present*
  Software Developer in Artificial Intelligence Co-op Burnaby, CA
  → Developed lease renewal prediction model using advance random forest in C#with ML.NET framework for property lease management in Microsoft dynamics 365.
  → Analyzed multiple algorithms and hyperparameters for model selection based on performance, complexity, explainability and training time considering constraints in application with python and sklearn in sandbox environment.
  → Developed power bi dashboard to visualize and analyze cumulative result and in depth analysis of prediction from AI model.
  → Iteratively improved model accuracy with data loaders, loss analysis, feature engineering and revealing vulnerability specifically related to application domain.
  → Created Microsoft power app with power flow and power automate in azure ml studio to read invoice images and capture billing information for automating the invoice processing method and hosted in azure cloud services.

- **Amelia** | *Aug. 2018 - Dec. 2020*
  Virtualization and Cloud Engineer Bangalore, IN
  → Managed a large-scale virtual infrastructure including more than 100 Cisco UCS utilizing Vmware on AWS to deploy and manage virtual machines, including Vcenter and Vmware Esxi hosts for Moody's analytics.
  → Configured vSphere for optimal resource allocation, including using DRS and HA for automatic failover and snapshot for point in time recovery.
  → Worked with PowerEdge servers and Cisco UCS hardware in the deployment of new infrastructure for Mckesson.
  → Conducted routine maintenance on virtual infrastructure at Rompetrol, including hardware upgrades and OS patching.
  → Deployed application specific containers using yaml deployment configurations in docker and Kubernetes for test env.

- **Dell Emc** | *Feb. 2016 - Jul. 2018*
  Associate Delivery Specialist Bangalore, IN
  → Assisted in the management of virtual infrastructure utilizing VCenter and vRA for Pfizer datacenters worldwide.
  → Utilized SAN and NAS storage systems, including HP Eva, Netapp, Isilon, VNA and VMAX.
  → Participated in Cloning, P2V and V2V migrations for both system and data center consolidation.
  → Utilized VRA for automated provisioning and maintenance of virtual infrastructure.
  → Within 2 years, became team lead of a 10-member team, achieving a 20% improvement in team performance through process optimization and skill development.

Projects

- **Emotional Messenger - Poster presented at CS Undergrad Research Symposium 22** *Jan. 2022 - Sept. 2022*
  Improving text-based communication by adding emotion with emotion detection Github
  → The purpose of this project is to improve the understandability of text-based communication(whatsapp) by adding emotion through the use of facial emotion detection and textual emotion recognition.
  → Utilized a CNN for facial emotion detection using opencv, sklearn and keras for facial recognition and FER2013 dataset was used to train the model. Accuracy for facial model was around 88%.
  → Developed a text emotion detection model which used tensorflow, keras for modelling and Glove dataset with word embedding from twitter dataset along with tokenizers library for data cleaning. Model accuracy was 85% for text to emotion detection.
  → Matplotlib, seaborn, sklearn and Plotly were widely used for univariate and multivariate analysis on dataset.
  → The project utilizes Google's text-to-speech library in python to voice the text with the recognized emotion and initially focuses on detecting four emotions (anger, happiness, sadness, and neutral)

- **Optimization of Rodinia benchmark kernel hotspot3D** *Sept. 2022 - Dec. 2022*
  Parallel programming for Heterogeneous system to optimize benchmark kernels used for chip designing Github
  → Hotspot3D is one of the 13 computational "grid structured" dwarf in Berkeley suite. It is a transient thermal modeling kernel with a execution time of 80 seconds on a CPU with a 64x64x8 layout.
  → Utilized vitis hls to generate RTL code for FPGA chip to optimize the kernel using various techniques including buffering, tiling, unrolling, array partitioning, pipelining and memory coalescing with OpenMp.
  → CUDA optimization is performed with warp partitioning, memory bursting, asynchronous multi-streaming and shared memory access in the kernel.

→ Computation time was reduced to 0.25 milliseconds and further reduced to approximately 0.14 microseconds with a CUDA implementation. This resulted in a computation speedup of more than 100x compared to running the code on a CPU.

- **Predicting NBA winner using Machine Learning** *Jan. 2021 - July. 2021*
  Sports prediction and comparison with legacy industry techniques **Github**

→ Aim for the project was to provide insights and strategies for improving prediction accuracy in the context of sports prediction(NBA) using Machine learning and evaluate ml techniques on sports dataset.
→ Two machine learning models were developed using the Keras, sklearn, pandas, and numpy libraries, logistic regression and artificial neural networks. These models were evaluated using various evaluation metrics. The performance of the two models was then compared using these metrics to determine which model was better for sports predictions.
→ The dataset for this study was obtained from Kaggle and consisted of boxscore data from NBA games from 2012 to 2019. In order to improve the accuracy of the results, the data was transformed by taking the average of the last five games played by each team. This remodeled dataset was then used to build and evaluate the machine learning models.
→ Accuracy of machine learning models was compared to that of gaming experts and reviewers, as well as betting websites. The results showed that the experts had an accuracy of 70%, while the artificial neural network model had an accuracy of 66%. The machine learning model thus had a slightly lower accuracy compared to the experts.

- **Black Box Machine Learning Model Interpretation** *May. 2021 - Aug. 2021*
  Interpreting Complex Machine Learning Models with LIME **Github**

→ Implemented LIME (Local Interpretable Model-agnostic Explanation) to interpret the predictions of a black box machine learning models Xtreme Gradient boost.
→ Focused on both interpretability and local fidelity in the interpretation of the model.
→ Utilized sklearn, pandas, numpy and label encoding in the model building and used K Medoid clustering for local feature importance.
→ Determined global and local feature importance and verified results on two datasets: bike sales price and NFL player statistics.

Certifications

- **Linear Regression with Time Series** *Jan. 2022*
  Python advance learning course, Kaggle **Credential**
- **Pandas** *Aug. 2021*
  Most widely used ML library, Kaggle **Credential**
- **SQL** *May. 2021*
  Structure Query Language Expert, Udemy **Credential**
- **VDC foundation** *Aug. 2017*
  Virtual Data Center Foundation, VMware
- **ITIL V3** *May. 2017*
  Information Technology Infrastructure Library, Peoplecert **Credential**

Technical Skills

- **Programming Languages :** Python, C/C++, C#, SQL, HTML, CSS
- **Operating Systems :** ESXi, Windows, Linux
- **Tools :** Matlab, Github, VS code/community, Jupyter, Google Collaborate (GCP), Anaconda, PyCharm
- **Courses :** Machine learning, Deep learning, Data mining, Linear systems, Affective computing, Programming for Heterogeneous systems, Data Structure and Algorithms

Volunteering Activities

- **Student Technical Staff** *Nov. 2021 - Dec. 2022*
  Simon Fraser University student technician at IT Services
- **International Community Leader** *Jan. 2022 - Sept. 2022*
  Community leader for International services for International students
- **Global Peer Educator** *Aug. 2021 - Jan. 2022*
  Peer educator for Student society at Simon Fraser University
- **ComSciCon Member** *Apr. 2021 - Aug. 2021*
  Science Communication workshop

Fields of Interest

- Artificial Intelligence and Machine Learning, Data Science, Gadgets, Psychology, History, Space and Chess.

Strength

- Creativity and problem solving, Team spirit and Leadership, Compassion, Punctuality and Communication.