Amath SOW

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EXPERIENCE

OlliTrip **Remote**
Machine Learning engineer *April 2022- Present*

- Built an AI based travel recommendation engine
- Built recommendation system for hotel using kafka, spark and elastic search
- Implemented a deep learning based attraction recommendation system using Restricted Boltzmann Machine
- Implement data pipeline and ML pipeline using Apache Airflow
- Deployed the models in AWS (Sagemaker, EC2, S3, etc)

Fellowship.ai **Remote**
Machine Learning Fellow *October 2022- January 2023*

- Worked on competitor analysis using Machine learning
- scraped nike products shoe
- Built data cleaning pipeline for csv data and image data loader for images shoes
- Built model pipeline using CLIP
- Implemented text and image embedding to fit into the CLIP model
- Used cosine similarity metric to get similar products
- Built a frontend application using streamlite and displayed the result.

Apziva **Remote**
Data Scientist *December 2021- July 2022*

- Used NLP techniques to rank potential talents identified on a job portal.
- Implemented machine learning algorithms on marketing data to forecast term deposits at banks.
- Built machine learning models to forecast customer satisfaction with 83% accuracy.

Intelligent Robot Learning Lab **Alberta/Canada**
Reinforcement Learning researcher *June 2020 - January 2022*

- Implemented four Human in Loop Reinforcement Learning(HCRL) algorithms using tensorflow framework : TAMER (Training and Agent Manually via Evaluative Reinforcement), COACH (Convergent Actor Critic by Human Feedback), DEEP-TAMER (TAMER using Deep neural network), DEEP-COACH (COACH using Deep neural network)
- Built a new HCLR algorithm, Variance-Reduce COACH(VR-COACH) which interprets the human feedback as reward and apply variance reduction technique on policy gradient commonly used in RL
- Experimented with VR-COACH in the classic MountainCar environment and DEEP VR-COACH in Goal navigation task(Malmo Minecraft).

Stem_away **California/USA**
Machine Learning Intern *June 2021-August 2021*

- Learn selenium and Beautifulsoup to do web scraping
- Filtered and data scraped the “CarTalk” forum in order to recommend to car users the necessary information needed to help navigate the forum
- Built a recommendation system using BERT pretrained model specifically for the “CarTalk” discourse forum which improved user experience : link to the certificate

Huawei Technologies(3G/4G) **Senegal**
Radio access network/Application and service engineer *January 2015- September 2018*

- Involved in Radio Access Network (RAN) maintenance and monitoring for 3G and 4G.
- Involved in Application and Service (AS) maintenance for the network intelligent: CRM, CBS, API SMS, USSD, Network KPI monitoring.

ORANGE(4G) **Senegal**
IRadio access network Intern for 4G network *March 2014- June 2014*

- Implemented IPSec to secure S1 and X2 interfaces for the Orange 4G network.
- Used tunneling with VPN, RSA asymmetric chiffrement with public key generation. Certification Authority (CA) and Deployment on CENTOS Server.

PROJECTS

Fashion AI : print generation using AI and 3D rendering

- Used latent diffusion pretrained model to generate print based on prompt
- Build react application that consume the latent diffusion model
- Build 3D rendering model using google model viewer
- Deployed the react application on AWS amplify
- Deployed the diffusion model on an AWS ec2 deep learning based instance using flask and gunicorn
- Implemented super resolution model to get better results.

Predict if the customer will subscribe to term deposit marketing

- Explored the data in order to know the distribution of the data
- Applied imputation technique for unknown value on data(mean, median and mode)
- Applied SMOTE technique by oversampling from the minority class(data highly unbalanced)
- Determined analytically the segment of customers that are more likely to buy the investment product.
- Built a stack of algorithms classifiers and train them using 5-fold cross validation. Decision Tree Classifier gives us the best accuracy(89%) with a recall of 90% of class 1 and 70% of class 0.
- Plotted the features importances about which features are going to be more useful for the next survey.

Predict if the customer is happy or not based on the answers they give to questions asked

- Explored and cleaned the data (126 data samples)
- Applied dummy encoding for categorical data
- Used the chisq test(chi2) for feature selection in order to know which features are more correlated with target variables.
- Built a stack of algorithms classifiers and train them using 5-fold cross validation. XGBoost gives us the best accuracy 78.12% which is greater than the expected accuracy(73%).

Variance Reduced Convergent Actor Critic by Human Feedback(VR-COACH)

- Reproduced COACH algorithm using tensorflow
- Built Episodic COACH by modifying COACH algorithm and computed the policy gradient for each timestep but the gradient update is done at the end of the episode.
- Observed that the gradient update is similar to the one in REINFORCE except that we have the human feedback in place of the reward and the eligibility decay λ in place of the discount factor.
- Built a new algorithm VR-COACH, which is an actor-critic based algorithm in which the human feedback is interpreted as reward.
- Experimented with VR-COACH in the classic MountainCar environment and demonstrated that it learns faster than COACH and TAMER.
- Upgraded our original VR-COACH to his DEEP version (DEEP VR-COACH) where agent's policy is represented as a deep neural network and apply Convolutional Auto Encoder strategy, a Feedback Replay Buffer and entropy regularization in order to learn complex task in a reasonable time
- Demonstrated the effectiveness of DEEP VR-COACH in the rich Malmo Mine-craft environment while comparing it with Deep COACH and DEEP TAMER.

Cassava Disease Classification using the images of cassava and Computer Vision approaches and semi-supervised learning:

- Explored and transformed the data using fast.ai deep learning library
- Used pretrained architecture(densenet101) and built our learner while using accuracy as metric and adam optimizer.
- Unfreezed the saved model, applied fine-tuning and slicing learning rate.
- Used our pretrained model to predict labels for our extra images (semi supervised learning).
- Trained the model on the new dataset on 30 epochs and end up with 92% of accuracy

EDUCATION

African Master in Machine Intelligence(AMMI) — **Ghana**
Master in Machine Intelligence — *March 2021*

Gaston Berger University — **Senegal**
Electronic and Telecommunication engineer — *November 2014*

Gaston Berger University — **Senegal**
Bachelor in Maths, Physics and computer science — *August 2011*

SKILLS & INTERESTS

Skills: Python (Scikit-Learn, PySpark), SQL, NoSQL,Neo4j , MongoDB,Apache Casandra, Docker, Ansible, Nagios, Selenium, Kubernetes, Terraform, AWS, Kafka, Elastic Search, GCP,Jenkins , Matplotlib, Seaborn, Linear Regression, Logistic Regression, Classification, Neural Networks, Natural Language Processing(Word embedding, LSTM, transformer, GRU, machine translation), computer vision(CNN, CAE, segmentation, object detection, object tracking), reinforcement learning(MDP, Q-learning, DQN, Actor-Critic, HCRL), Keras, TensorFlow, Pytorch, Agile Methodologies

Interests: watching futuristic movies - discuss with friends and family - play soccer