Waqar Hassan

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OBJECTIVES

Secure a responsible career opportunity to fully utilize my training, skills and experience, while making a significant contribution to the success of the company.

EDUCATION

2018 - 2022 **Ph.D - Universidade de São Paulo, Brazil**
Computer Science (Machine Learning)

2014 - 2016 **Masters - International Islamic University Islamabad, Pakistan**
Electronics Engineering (Communication & Signal processing)
CGPA: 3.90 / 4.00

2014 - 2016 **BSc. - Comsats Institute of Information Technology, Islamabad**
Electrical Engineering (Telecommunication)
CGPA: 3.28 / 4.00

SKILLS

Data Analysis	Exploratory Data Analysis, Data Preprocessing, Feature Engineering
ML	Classification, Regression, Quantification, Clustering
Deep Learning	Neural Networks, Convolutional Networks, Recurrent Networks
NLP	NER, Machine translation, Emojify, Text & Music generation
Programming	Python (Pandas, Numpy, OpenCV, Sklearn, Tensor flow, Keras), SQL, ECL
Visualization	Matplotlib, Seaborn, Tableau
Tools	Jupyter Notebook, VSCode, Colab, Jira, Latex
Big Data	Spark, HPCC (distributed technology parallel to Hadoop or Spark)
Time Series	Forecasting, ARIMA model
Statistical	Hypothesis testing, A/B testing, Regression analysis
Evaluation	Cross-validation, Hyperparameter tunning, Ensemble methods
Versioning	Git
Cloud	AWS

WORK EXPERIENCE

10-2021 - 3-2023 **Software Engineer II — LexisNexis Risk Solutions, Brazil**
- Deals with Big Data using High Performance Computing Clusters (HPCC systems).
- Employ the skills in Extract Transform Load (ETL) pipeline.
- Data cleaning, parsing, reformatting, scrubbing and automation.
- Apply ML in ETL and analyzing the trends in data provided by different vendors.
- Apply ML in Data Linking to predict the trends in match count for target

field.
- Apply ML to estimate the vendors contribution in the matched count. It helps the company to prioritize the vendors according to their contribution in the final product solution.

3-2018 - 7-2022 **Researcher — University of São Paulo, Brazil**
- Data collection using mosquito trap sensors.
- Developed a comprehensive Experimental Setup for Quantification.
- Apply Quantification on mosquitoes and other benchmark datasets.
- Estimate density of harmful mosquito species in a specific region.
- Developed a fast and accurate quantification method.
- It is helpful for quantification of Big Data and fast paced Data Streams.
- Easy hardware installation and requires less memory & processing time.

PROJECTS

Neural networks and Deep Learning Projects

Computer Vision:

1. Implement a one-shot learning for **facial recognition** application. Develop for both facial verification and recognition tasks. Employ the **Inception model** network architecture.

2. Implement **object detection** on a car dataset using the pre-trained **YOLO model**. Moreover, uses the non-max suppression to increase the accuracy.

3. Implement **semantic image segmentation** on the CARLA self-driving car dataset using **U-Net model**. Apply sparse categorical crossentropy for pixel wise prediction.

4. Build an **Alpaca/Not Alpaca classifier** using transfer learning. Adapt a pretrained model to new data and train a classifier using the Functional API and **MobileNetV2** model. Fine-tune a classifier's final layers to improve accuracy.

5. Implement the basic building blocks of **ResNets** in a deep neural network using Keras. Put together these building blocks to implement and train a state-of-the-art neural network for **image classification** of hand sign dataset.

6. Implement a **ConvNet** model for binary and muti-class classification problem. For binary task, trained the model using tensor flow dataset (happy dataset) and the objective is to detect whether the people in the image is smiling or not. For muli-class task, train, validate and test the model on hand sign dataset.

7. Use **VGG19 model** to generate new artistic images from content and style images by employing **Neural art transfer**.

8. Experiment normalization approaches, activation methods (Sigmoid, Tanh, Relu), initialization methods (random, zeros, He or Xavier), regularization techniques (L2, Dropout), gradient checking, and optimization approaches (random Minibatching, Adams, Learning rate decay scheduling) to see their effects on the results and understand their importance and get knowledge when to use which approach for a particular case.

Natural Language Processing (NLP):

1. Optimize a Transformer model to perform **Named-Entity Recognition (NER)** on a dataset of resumes. Employ tokenizers and pre-trained models from the HuggingFace Library.

2. Implement extractive **Question Answering** by fine-tuning a pre-trained **Transformer model** to a custom dataset.

3. Build a **Neural Machine Translation (NMT)** model to translate human-readable dates ("25th of June, 2009") into machine-readable dates ("2009-06-25") using an **Attention model**.

4. Construct a speech dataset from synthesized data and implement an algorithm for **trigger word detection** (also called keyword detection, or wake word detection).

5. Implement an **Emojifier** which inputs a sentence (e.g. "Let's go see the baseball game tonight!") and finds the most appropriate emoji to be used with this sentence.

6. Build a character-level **text generation** language model, to generate names for new breeds of dinosaur.

7. Build a model that uses an LSTM to **generate music**.

8. Worked on **text classification**, sentiment analysis using Tensor flow and Keras.

Amazon Web Service (AWS):

1. Create a simple **Amazon Lex chatbot** for a customer service that uses a **Lambda** function for fulfillment.

2. Build, train, and deploy machine learning models using **Amazon SageMaker**.

3. Use **Amazon Transcribe** to transcript the audio recording and then use **Amazon Translate** to translate the transcribed text to specific language.

4. Use **AWS machine learning services** for computer vision, data extraction and analysis, and language processing.

CERTIFICATIONS

- **Deep Learning Specialization**
  Credential: `https://coursera.org/verify/specialization/QVFZFTJY9QVC`
- **Custom and Distributed Training with TensorFlow**
  Credential: `https://coursera.org/verify/GTC6QSZ5D9Q5`
- **Introduction to Machine Learning on AWS**
  Credential: `https://coursera.org/verify/2X9ALT2VBATF`
- **Sequence Models**
  Credential: `https://coursera.org/verify/MS729W94PZ7N`
- **Convolutional Neural Networks**
  Credential: `https://coursera.org/verify/ATRNSC6QHC2D`
- **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization & Optimization**
  Credential: `https://coursera.org/verify/9UMXWZF92D69`
- **Structuring Machine Learning Projects**
  Credential: `https://coursera.org/verify/XG5GWLJYFVBR`
- **Neural network and deep learning**
  Credential: `https://coursera.org/verify/W8AFSVAC4R6G`

PUBLICATIONS

1. Accurately Quantifying under Score Variability
   2021 IEEE International Conference on Data Mining (**ICDM**)
   DOI: 10.1109/ICDM51629.2021.00149

2. Pitfalls in Quantification Assessment
   First International Workshop on Learning to Quantify: Methods and Applications (**CIKM**)

3. Accurately Quantifying a Billion Instances per Second
   2020 IEEE 7th International Conference on Data Science and Advanced Analytics (**DSAA**)
   DOI: 10.1109/DSAA49011.2020.00012

4. The Importance of the Test Set Size in Quantification Assessment
   Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence (**IJCAI**)
   DOI: 10.24963/ijcai.2020/366

AWARDS & ACHIEVEMENTS

Best research paper award

Paper Title: **Accurately Quantifying a Billion Instances per Second**
Scholarship: TWAS-CNPq

EXTRA-CURRICULAR ACTIVITIES

- Organized twice cultural event VIRSA in 2011
- Member of COMSATS Engineering Club (CEC)
- Member of COMSATS Student Entertainment Club (SEC)
- Participant of Heath Awareness Campaign at Comsats

INTERESTS

Internet	Social networking, Browsing
Sports	Cricket, Football
Entertainment	Music, Movies
Other	Travelling, Hiking