

# DHAVAL SALWALA

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**VISA Type:** Stamp 1

## SUMMARY

A passionate professional with 6+ years of diversified industry experience and exposure to implementing methodologies in Machine Learning. I have a substantial record of performing in teams and as an individual contributor. Possess strong analytical and programming skills. With experience in Python, Knowledge Graphs, Complex Event Processing, Deep Learning. Hands-on with Kubernetes/Docker and ML libraries viz. NumPy, Pandas, Scikit-learn and Tensor Flow.

## EDUCATION

**Sep 2018 – Aug 2019**

**MSc. Computer Science – Data Analytics**

National University of Ireland, Galway, Ireland

**Result:** 1.1 (First Class Honours)

**Modules:** Natural Language Processing, Machine Learning, Deep Learning, Data Visualization, Data Analytics – Hadoop Map-Reduce, Statistical Modelling, Game Theory, Linked Data and Knowledge Graphs.

**June 2008 - May 2012**

**Bachelor of Engineering - Information Technology**

Gujarat Technological University, Ahmedabad, India

**Result:** 7.98/10 (First Class with Distinction)

**Modules:** Object Oriented Programming, Data Structures, Algorithms, Operating System, Advanced Java.

## ACADEMIC PROJECTS:

- **Master's Thesis:** Evaluation of Multi-Agent Deep Reinforcement Learning algorithms
  - Central policy based on de-centralized parameter sharing in the Pursuit-Evasion environment.
- **Multiclass image classification:** Implemented a feed-forward neural network with backpropagation in python. All three channels were averaged into a greyscale vector of 1024 floats. The model was tested on CIFAR-10 dataset of 10 images.
- **One-shot Face Recognition:** Built a LeNet5 based deep convolutional model in Keras with a triplet loss function. The model was trained on 10,000 images of the VGG-Face dataset. It uses Euclidean distance between image embeddings to predict the image class.
- **Image Clustering:** Used pre-trained VGG16 model, chopped FC layer, and fine-tuned as per dataset. Predicted embeddings were passed to K-Means clustering to form clusters.

## WORK EXPERIENCE

**Oct 2019 – Present**

**Research Assistant, Data Science Institute, NUI Galway, Galway**

**Technologies:** Python3, Docker, RedisGraph, RedisStreams, Node.js, TensorFlow, DNN Image models

- Designed and implemented Computer Vision Pipeline for Gnosis CEP engine in Python/Redis Streams/Docker.
- Assisted in scientific research on analysing Complex Event Patterns (CEP) in Multimedia Streams. Worked on individual problem sets.
- Worked alongside Postdoctoral Researchers and PhD students on resolving design challenges and refining CEP pipelines.
- Collected and studied large scale video datasets. Performed manipulating, processing, and extracting value from these datasets. Ran Image Processing models to analyse the accuracy and prepared ground data - TensorFlow/Keras.
- Adopted efficient architecture to execute ML model periodically as a batch on streaming video data.
- Designed the approach of benchmarking CEP Pipeline that include Object Detection, Object Tracking and Annotation via Jaeger/Python.
- Implemented ML data pre-processing pipeline as microservices and deployed in a Docker ecosystem.

- Modelled data obtained through the CEP pipeline into a Knowledge Graph through spatiotemporal relationships.
- Devised a schematic approach to Video Query Processing by writing a Grammar for Video Query Language in ANTLR4. Created and mapped video data as a knowledge graph in RedisGraph Database via openCypher.
- Assistant Chair and co-organiser for the 27th AIAI Irish Conference on Artificial Intelligence and Cognitive Science, Galway, Ireland, December 5-6, 2019.

**Dec 2012 – Aug 2018**

**Software Developer, Tata Consultancy Services (TCS), Pune - India**

### **Eurex Advanced Risk Protection (ARP) – Deutsche Börse Group.**

**Technologies:** Java8, EJB3, Python3, Spring Boot, Hibernate, Apache Qpid, Jboss7, PostgreSQL, Git, Maven, Protocol Buffers.

- Member of the Design Team that created technology stack for a risk interface application that monitors risk exposure in real-time for Eurex Exchange T7.
- Led a team of associates to critical deliveries. Leveraged strong expertise in solving and identifying bugs while working with production support.
- Worked closely with Business Analysts in mapping the business requirement with the Physical Data Model.
- Developed AMQP interfaces to different cross-platform business entities and facilitated data exchange using Google Protocol Buffer (GPB).
- Architect a state-of-the-art Cash Payment System (CPS) for Eurex Trading Platform T7. It offers a high degree of flexibility in terms of processing trades, payment locations, message formats and cross-currencies transactions.
- Created chained transaction handling using Spring Transaction Management.
- Configured cluster-based deployment environment in Python3 in Red Hat Enterprise Linux Server.
- Developed SWIFT message simulator in Spring Boot that performs load testing on thousands of concurrent payment instructions.

### **ICG Credit Approval System – Citigroup Corporation.**

**Technologies:** Java, Spring, Hibernate, Tibco iProcess, Adobe Flex, IBM WebSphere, Oracle10g, SVN, JAX-RS, HP Load Runner, Jenkins

- Gained functional knowledge while working with legal, compliance and lending team on credit approval workflows and lending practices.
- Optimized Citigroup's Risk Management Business workflow using TIBCO iProcess and Spring Scheduler.
- Enhanced UI response rate and operational efficiency of the platform by eliminating legacy codebase.
- Working on Design Patterns, Unit Testing, Refactoring, Code structuring.

### **TECHNICAL SKILLS**

- **Proficient** in Python3, Java8, R, Node.js, RDF 1.1
- **Well versed** with Docker, Spring Boot, Hibernate, Redis Streams, Spark Streaming, Big Data / Hadoop basics
- **Hands on experience** with Tensor Flow, Keras, NumPy, Pandas, Scikit-learn and DNN models.
- **Worked on** Oracle 10g, PostgreSQL, RedisGraph and Google Protocol Buffers.

**Tools:** IntelliJ, GitHub, Jenkins, JBoss 7, Jupyter Notebook, Tableau, Google Cloud Platform

**Courses:** Python for Data Science, Machine Learning with Tensor Flow, Convolutional Neural Networks, Deep Reinforcement Learning.

### **ACHIEVEMENTS**

- Copernicus Hackathon Ireland 2019 Winner: Proposed idea to improve the accuracy and precision of real-time air quality data. Data taken from Sentinel 5p satellite.

- Class Representative for the MSc. Data Analytics 2018/19 which involved liaising between staff and students.
- Received a 'Star of the Month' award for Flawless delivery of a critical requirement - TCS.

### **INTERESTS**

- A Passionate Hiker and a Travel Enthusiast. Have travelled to various places around Pune and North India.
- WaveMaker (Volunteer) at Galway 2020 European Capital of Culture.

### **REFERENCES**

Dr. Edward Curry  
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