# NareshKumar D

Data Scientist II

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**Data Scientist-II at Carbynetech India Pvt. Ltd | Best Paper awardee @ ICInPro-2019 | NIT-Trichy'2020**

## Publications

1. **A Semantic-Aware Strategy for Automatic Speech Recognition incorporating Deep Learning Models**. *Proceedings of Intelligent System Design* (2021).
2. **A Novel Hybridized Strategy for Machine Translation of Indian Languages**. *ICSCSP, AISC (SCOPUS)* (2020).
3. **A Novel Semantic Approach for Intelligent Response Generation using Emotion Detection Incorporating NPMI Measure**. *Procedia Computer Science Journal.* **(Best Research Award)** (2020).
4. **A Semantic Approach for Entity Linking by Diverse Knowledge Integration incorporating Role-Based Chunking**. *Procedia Computer Science Journal* (2020).
5. **OntoQuest: An Ontological Strategy for Automatic Question Generation for e-assessment using Static and Dynamic Knowledge**. *Fifteenth International Conference on Information Processing.* **(Best Paper Award)** (ICInPro-2019).
6. **A Novel Approach for Inter-Domain Personalized Search based on Semantic Set Expansion** (ICInPro-2019).

## Education

**Bachelor of Technology,** National Institute of Technology, Tiruchirappalli, CGPA: 7.7/10.0 **July 2016 — July 2020**

**Courses taken :** Data Structures and Algorithms, DBMS, Computer Architecture, Network Security

**Online Courses :** Deep Learning Specialization (Coursera) by deeplearning.ai

## Work Experience

**Data Scientist-II, Carbynetech India Pvt. Ltd.** **Feb 2021 — present**

*1. Custom Object detection model for PID symbol detection using GANs, YOLO v4, detectron2.*

- Implemented a custom **Faster RCNN** model for P & ID symbol detection that competes with Template Matching in terms of inference time and mAP.
- The proposed model reduced inference time by **over 50%** as compared to Template Matching while maintaining **94 mAP**
- Developed GANs, Image Processing techniques for data balancing. Implemented object detection model incorporating slicing technique for **34 classes**.

*2. Quality Inspection of export pallets using Computer Vision.*

- Implemented **Azure Custom Vision** model for detection of attributes such as damage, labels, bar-codes and logos on export pallets.
- Integrated **custom python script for object counting**, and other requirements into Azure Custom Vision model.
- Developed end-to-end **web-application using Angular Framework, utilizing Azure App Services**, Blob Storage, and Flask APIs.

*3. Trade Promotion Optimization using Machine Learning models, including FbProphet for Sales Forecasting, Ensemble Learning.*

- Fine-tuned **FbProphet** model in extending patterns from past data to future dates to perform better in comparison with LSTM, SARIMAX. Consolidated **Seasonality** and other temporal effects.
- **Increased ROI by 40%** by integrating **ExtraTree Regressors, R square: 0.98,** for sales lift calculation.
- Proposed an alternative method for promotion optimization incorporating **Linear Mixed Effects Models and Bayesian Optimization to maximize total sales, ROI** while minimizing promotional costs.

*4. Predictive Condition Monitoring in machines for Asset Management and Waste minimization.*

- Analyzed sensor data that includes Product manufacturing duration *(from IoT Gateway)* to identify **the best and the worst assets at different levels (SKU/asset/Work Order)**.
- Performed descriptive statistical analysis, used ML Algorithms (Clustering) to identify the best **sequence of assets** for a given work order while minimizing the SKU production duration.
- **Reduced production delay and waste produced by over 12% and 18% respectively** per work order.

**Technologies:** Azure App Services, Azure data bricks and Blob storage, Microsoft Azure cloud services, Azure Custom Vision.

**Applied Deep Learning Engineer, AIDesign Pvt. Ltd.** **July 2020 — Jan 2021**

- Developed end-to-end Deep Learning models to **solve real-world fluid flow and CFD problems** at a significantly faster rate compared to commercial software.
- Developed a **DNN** that predicts desired parameters on several engineering and mathematical problems with **less than 5% relative error** on loading conditions up to **30 times (30x)** those seen in training.
- Developed a CNN model to predict temperature contours with less than 10% relative error for 2-D heat conduction problems on materials and domain sizes not seen in training.

## Academic Projects

**Research Assistant, Department of Computer Science and Engineering, NIT Trichy.** **Aug'19 — Nov'19**

*Classification and Recommendation of e-books towards metadata unification in digital libraries*

- Proposed a user-perspective based **e-book recommendation system**. The proposed model uses genres, titles, user clicks into consideration to **formulate user preference Term-Set**.
- Two-layered RBFNN with a feedback layer has been implemented for classification, followed by **ontology creation using top 25% results from classification results**.
- The proposed model yielded an average **accuracy of 93.78%** for classification, **average DCG of 0.94**.

**Research Assistant, Department of Computer Science and Engineering, NIT Trichy.** **Mar'19 — May'19**

*Emoji Prediction from Twitter data using Machine Learning techniques.*

- A text classification problem, mapping input text to their most likely accompanying emoji, utilizing close to 100,000 scraped Twitter tweets for our training set.
- **Stochastic Gradient Classifier**, Multinomial Naive Bayes Classifier, Gaussian Naive Bayes Classifier and Random Forest Classifier have been employed for the implementation.
- It was observed that the Random Forest Classifier gives the best **accuracy of 56% with a runtime of 35.5 seconds**.

## Awards and Honors

- **Best Paper Award**, International Conference on Information Processing, ICInPro, ID: 41.
- Honorary **Rosalind membership at London Journal Press** for published work in Procedia Computer Science. Membership ID #CS52299.
- **Best Research Award** by ScienceFather.Inc, Award ID: 1972

## Technical Skills and Certificates

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|---|---|---|
| **Languages & API** | **:** | Python, C++, R, Flask |
| **Concepts/Frameworks** | **:** | ML, DL, RL, CNN, RNN, Tensorflow, Keras, NLP, ARIMA, PyTorch |
| **Packages** | **:** | Scikit-Learn, Numpy, Pandas, NLTK, Scipy, Matplotlib, Statsmodels, Seaborn |
| **Databases & Systems** | **:** | SQL, Jupyter & Colab Notebooks, AutoEncoders |
| **Certificates** | **:** | Deep Learning Specialization, DataStructures and Algorithms Specialization |
| **Deployment** | **:** | Azure App Services, Azure cognitive services, Azure Blob storage, Azure Data Bricks |