

# Bharat Runwal

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## EDUCATION

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### Indian Institute of Technology, Delhi

2018-2022

B.Tech in Electrical Engineering  
(Power and Automation)

## ACADEMIC ACHIEVEMENTS

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- Among the top 50 students(out of 800 students) to get a **Department Change**, in first year
- Among Top 1% in Joint Entrance Examination(JEE Advanced 2018) among 62k candidates
- Awarded Merit Prize for Class X, RBSE board Examination

## EXPERIENCE

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### HPI Potsdam , Germany

Oct 2020- March 2021

*Research Intern* | Supervisor: Prof. Gerad De Melo

*Remote*

#### Semantic Similarity based on Sense Embedding Induction:

- Investigated to what extent WordNet inventory can be used to induce sense embeddings.
- The method is based on the deconflation approach with additional constraint satisfaction enforcement.
- Our proposed method achieved state-of-the-art results on Simlex-999 and Simverb-3500.

### RapidAI Vision

Summer 2020

*Deep learning Intern*

*Work From Home*

#### Vehicle Tracking and Speed Estimation :

- Deployed a Real time Vehicle tracking,detection and speed estimation of surveillance camera or traffic camera footage
- Used DeepSORT (with YOLOv4) for vehicle tracking & pretrained deep association metric model(cosine metric learning approach)
- 3D Speed Estimation Based on Fusion of Visual and Semantic Features which was used in NVIDIA 2018AICity challenge was implemented for speed estimation of camera footage
- Used Tensorflow Serving for deployment purpose, deployed vehicle detection and tracking model using REST API(AWS Lambda)

## PROJECTS

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### Generating Summaries & Sentiment prediction of Financial news| *Startup Project*

June 2020

- Used Google PEGASUS model from Huggingface for summary generation,with preprocessing of the newspaper articles
- Used FinBERT(Financial BERT) model from for sentiment prediction of generated summaries
- Used various preprocessing like: Extracting Cardinal or price entity for getting the information about stock prices

### Anomaly Detection in Time series Data of S&P500 | *Self Project*

May 2020

- Used LSTM Autoencoder to detect anomalies related to sudden change in close price of S&P500(stock market index)
- Dataset was obtained from Kaggle which was from 1986-2020,used 30 timesteps which made the training stable

### BuildwithAI Hackathon | *Team Project*

July 2020

- Designed a solution for valid,trusted family care using NLP to match families and parents to on-demand care givers
- Keyword matching and entity extraction using spacy library for extracting attributes from supply and demand side
- To provide better matching for searches we calculated semantic similarity of sentences using **GloVe** representation

### Implementation of Graph Data Structure | *Course project*

Nov. 2019

- Implemented fast & efficient data structure which can represent a modifiable mesh given vertex positions as input
- Designed optimized algorithms to answer various queries on processed mesh efficiently even for very large meshes

## TECHNICAL SKILLS

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**Languages:** Python, Java,C++,R,PostgreSQL,HTML/CSS,JS,MATLAB

**Frameworks:** Pytorch,Tensorflow,Keras,Flask,FastAPI

**Utilities:** OpenAIGym,OpenCV,Git,Docker,AWS,LATEX,Linux shell utilities

## RELEVANT COURSES

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**Computer Science:** Deep learning, Machine learning , Data Mining , Data Structures and Algorithms

**Mathematics:** Probability and Stochastic Processes,Introduction to Linear Algebra and Differential Equations, Introduction to Calculus.

**Electrical:** Optimization Theory,Signals and System, Circuit Theory, Digital Electronics,Embedded Systems,Control Engineering

**MOOC/Online:** CS224W(Machine Learning with Graphs, Stanford),CS231n(Visual recognition, Stanford),CS224n(Natural Language Processing with Deep Learning, Stanford),Deep learning specialization(**Coursera**),Machine learning (Stanford university)(**Coursera**),Deep learning in Computer Vision(HSE University)(**Coursera**)