Pratyush **Kumar**

Data Scientist · Deep Learning Engineer

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Summary

Current Data Scientist in AI firm ParallelDots, Inc. 1+ years experience specializing in deep learning and machine learning. Interested in solving cutting edge AI problems, applying machine learning in finance, learning new things, writing blog and exploring the world.

Work Experience

ParallelDots *Gurgaon, India*

Data Scientist *May. 2017 - PRESENT*

- Work on an AI health-care product (*Dentistry.AI*) which mark dental caries on bitewing X-rays.
- Developed multi-step deep learning model to detect dental caries from bitewing x-rays.
- Implemented computer vision tasks viz., classification, detection, semantic segmentation on real world X-rays images.
- Develop model perform much better in predicting dental caries than expert dentists.

Education

Indian Institute of Technology Roorkee *Roorkee, India*

B.Tech. in Production and Industrial Engineering *Jul. 2013 - Apr. 2017*

- CGPA: 6.811/10

Holy Mission School *Muzaffarpur, India*

Senior Secondary (CBSE) *2013*

- Percent: 90.8%

Publication

Detection of Tooth caries in Bitewing Radiographs using Deep Learning

NIPS 2017 ML4H, Long Beach, CA *Nov. 2017*

- Developed a Computer Aided Diagnosis (CAD) system, which enhances the performance of dentists in detecting wide range of dental caries.
- Developed annotated dataset of 3000 bitewing radiographs and utilize it for developing the CAD system.
- The CAD system consists of a deep fully convolutional neural network consisting 100+ layers, which trained on bitewing radiographs.
- Compare the performance of proposed CAD system with three certified dentists for making dental caries and exceeds the average performance of the dentists in both recall (sensitivity) and F1-Score (agreement with truth) by a very large margin.

Certifications

Deep Learning Specialization (deeplearning.ai)

Coursera *Mar. 2018*

- Neural Networks and Deep Learning: Computational Graph, Vectorization, Shallow and Deep Neural Networks
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Deep Learning Frameworks
- Structuring Machine Learning Projects: Evaluation metrics, Error Analysis, Transfer Learning, Multi-task Learning, End-to-End Deep Learning
- Convolutional Neural Networks: Object Detection, Face Recognition, Neural Transfer, Region Proposal, Landmark Detection, NMS, YOLO
- Sequence Models: RNN, GRU, LSTM, Natural Language Processing, Word Embeddings, Sentiment Classification, Beam Search, Attention Model

Data Analyst Nanodegree

Udacity *Sep. 2016*

- Data Analysis, Data Wrangling, Exploratory Data Analysis, Data Visualization, Machine Learning, A/B Testing

Machine Learning (Stanford University)

Coursera *Oct. 2016*

- Linear regression, Logistics Regression, Cost Function, Gradient Descent, Bias/Variance, Support Vector Machines, K-Means, Neural Network (Representation & Learning), Dimensionality Reduction, Anomaly Detection, Gaussian Distribution, Online Learning, Recommender Systems

CourseWork

Probability and Statistics, Engineering Mathematics, Product and Process Optimization, Operation Research, Robotics and Control, Machine Design, Programming and Data Structures, Engineering Economy, Economics, Financial Management, Banking and Bank Finance

Skills

Programming	Python, Java, R, C++
Data Analysis	NumPy, Pandas
Data Visualization	Matplotlib, D3, ggplot2
Machine Learning	Scikit-learn, Xgboost, LightGBM, TPOT
Deep Learning	PyTorch, Lasagne, Keras, Theano, Tensorflow
Misc.	Git, MySQL, Academic research, LaTeX

Achievements

2018 **74 out of 2310,** World Bank Poverty Prediction competition hosted by DrivenData

2017 **54 out of 1404,** NSE ISB CodeSprint competition hosted by HackerRank

2016 **Top 18%,** Allstate Claims Severity competition hosted by Kaggle

2016 **Bronze,** Week of Code 19 competition hosted by HackerRank

Projects

Haptics Robot for Motor Rehabilitation

IIT Roorkee *Aug. 2016 - Apr. 2017*

- The project involves design and development of haptic planner robot hand.
- Virtual environment for providing force feedback mechanism to the haptic hand is being developed.
- Machine learning algorithms like the Neural Network has been implemented to train the haptic hand.
- Finally, the hand is used for motor rehabilitation purposes.

Identifying Fraud from Enron Emails and Financial Data

Udacity *Jul. 2016 - Aug. 2016*

- The Aim was to explore the Enron dataset, use data wrangling and visualization techniques to clean and visualize the data, find the correlation between various features, identify extreme outliers and finally use the appropriate machine learning algorithm to predict Person of Interest 'POI' i.e., employees who committed fraud.
- The accuracy of algorithms was calculated by the F1 score; the logistic regression with PCA gave the best results.
- Achieved the highest accuracy among all the code submissions.

OpenStreetMap Data Wrangling with SQL

Udacity *May. 2016 - Jun. 2016*

- Implemented data munging techniques like assessing the quality of the data for validity, accuracy, completeness, consistency and uniformity
- Used ElementTree to parse the OSM file which had lots of inconsistencies in the dataset viz., abbreviations, lowercase, misspelling etc.
- Created regex to clean and standardize the dataset. Queried the dataset to extract useful information viz., number of unique users, common amenities, popular places etc.
- Created an input data model so that new users follow it to reduce the number of inconsistencies.

Explore and Summarize Data Using R

Udacity *Jun. 2016 - Jul. 2016*

- Used R and apply Exploratory Data Analysis (EDA) techniques to explore relationships in one variable to multiple variables and explored a Wine data set for distributions, outliers, and anomalies.
- Main objective was to explore the chemical properties influences the quality of red wines.
- Concluded that the major factors for better wine quality is alcohol, acidity and sulphates. See HTML preview here.

Extracurricular Activities

IITiansClub

Executive Member *Mar. 2015 - Aug. 2016*

- Worked as an Executive Member of IITiansClub.com (a study portal to help and guide JEE aspirants to prepare effectively).
- Created Practice Lounge for online quizzes and tests. Developed a discussion forum for the online doubts and counseling.

Robotics Club, IIT Roorkee

Member *Jun. 2014 - Apr. 2015*

- Worked as a member to conduct various robotics lectures, organized events and programmed KUKA robot.
- Created a snake robot and programmed it with arduino that can easily climb on the wall.

NSS, IIT Roorkee

Member *Jul. 2013 - Apr. 2015*

- Taught more than 80 underprivileged students from primary schools who could not otherwise afford tuition fees.
- Actively participated in organizing events such as Blood Donation camp, Tree Plantation drives.