Vedant Kumar

Data Scientist

B.Tech ECE VIT, Vellore
2011-2015

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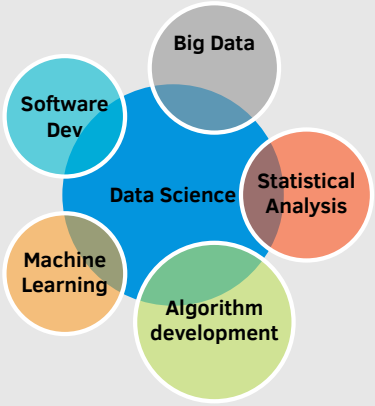
Skills



Interests

Software Development

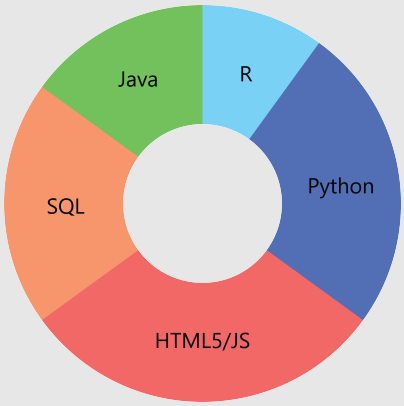
Data Analysis and Big Data

Machine learning and Neural Network

Data Mining & Statistical Analysis

High Performance Computing

Languages



Summary

Data Scientist with 4+ years of experience in a flagship project of the India's space mission namely ASTROSAT Observatory, Avere consulting, Sleepiz AG and other positions. Skilled in statistical data analysis, machine learning, deep learning, data mining, predictive modelling ,high performance computing, and programming.

Professional Experience

March 2019 - Present **Data Scientist** Sleepiz AG

- Machine learning and deep learning algorithm development, model interpretation.
- Applying Machine learning and deep Learning modules (supervised, unsupervised, reinforcement learning) on bio medical data.
- Built end to end pipeline including EDA, preprocessing of data, extraction of data, feature engineering, feature selection, unsupervised learning, classification and regression task. Machine learning methods used such as Decision Tree, CART, Random Forest, XG Boost, Support Vector Machine, Naive base, Linear discriminant analysis, Bayesian network, Gaussian Mixture Models, Hidden Markov Model, PCA, T-SNE, UMAP, generative modelling such as GANs. CNNs, RNNs, LSTM, DBNs, Autoencoder, Variational autoencoder.
- Dimensional reduction with UMAP and t-SNE on the vital signal of the body such as EEG, ECG, Respiration for separation of Vital Stages. Abstract accepted at international conference.
- CNN-LSTM, CNN-RNN, RCNN, GRUs on various bio-signal problems including prediction, and classifications.
- Probabilistic graphical model using Bayesian Networks for time series prediction, anomaly detection and decision making.
- Signal processing, improvement of algorithms, entropy-based kernel extraction, rapid ground truthing and model validation on biomedical signals.

Nov 2015 - Feb 2018 **Software Engineer** AstroSat Payload Operation Center IUCAA(ISRO)

- Analysis of astronomical data based on statistical technique such as regression, interpolation, navie bayes, chi-square, fisher's exact test, correlation test extensively in python and R.
- Development of data software pipeline (in C and C++ routines, rapped in shell scripts, on distributed cluster in Linux environment) for Astrosat mission which process the raw data acquired from satellite to scientific products such as images, spectra and time series data.
- Processing of astronomical data (FITS file format) on computer cluster used FV, CFITSIO, DS9, XSPEC
- Web application development using HTML5, CSS3, JavaScript, JSON, and JQuery
- Large scale database development for several instrument parameters and simultaneous API development for visualization.
- Parallel processing of astronomical data processing on cluster, multiprocessing approaches - Pool/Map, Process/Queue and Parallel Python, MPI, OpenMPI.
- Machine learning tools with convolutional neural networks for detection and parameter estimation of several signature of astrophysical transients.
- Calibrations of CZTI instrument parameters, presented a talk at 11th International Astronomical Consortium for High Energy Calibration, monitoring of anomalies in data, public package release and documentation.

Tools used: Machine Learning Libraries (scikit-learn, Tensorflow, Keras, Pytorch, Caffe, Theano NLTK, CNTK, MXnet, Gluon,), Docker, AWS, Google Cloud, Unix, Linux, SAS, R, C, C++,Shell scripting, MATLAB, Python (NumPy, SciPy, Astropy, Pandas, multiprocessing, Numba, XG Boost, Pendulum, Arrow, Request, Dash, Matplotlib, Seaborn, Bokeh, Plotly, OpenCV), H2O, **Visualization:** Microsoft Power BI, Tableau, ggplot2, mayavi] MongoDB, Hadoop, Mysql, PySpark, Javascript, Drupal CMS, Git, Github, Gitlab, Bitbucket, SVN, CUDA C/C++, CuDNN, MPI, OpenMPI.

June 2015 - Oct 2015 **Instrumentation Engineer** Avere Consulting, Chennai

- Application programming interface(API) development for drones, flight controller development, sensor integration

May 2018 - Nov 2018 **Visiting Research Fellow** Harish-Chandra Research Institute

- Performed test of the General Relativity in strong gravity regime through numerical relativity
- Two posters describing the test of general relativity and preliminary results were presented at the 29th Texas Symposium on Relativistic Astrophysics Dec 2017 in Cape Town, SA
- Did simulation in advanced collider physics, used monte carlo and markov chain monte carlo on large-scale supercomputer

Feb 2018 - Present **Chegg Subject Expert** Chegg India

- Work as a subject expert in advanced physics and statistic(probability, classical mechanics, Quantum mechanics, Electromagnetic theory, Solid state Physics, etc.) at an on-line education platform Chegg

Extracurricular

- **Online Education**: Work as Chegg Subject Expert, strongly advocate high-quality education of everyone and everywhere and possible through MOOCs and Online Education
- **Volunteer**: Volunteered at Make A Difference in primary education of children. Promote the cause of health care, environmental preservation, and quality education of underprivileged children
- **Armature Astronomy**: Club Coordinator@VIT Astronomy Club, Organized visits to ISRO Satellite Center(ISAC) and Vainu Bappu Observatory
- **Robotics and Aerospace**: 2nd prize in event DIy: Crafting With Cochin, by MIT Media Lab and Nokia at INK Live 2013, Quad-rotor for outdoor surveillance as a final year bachelor thesis, Team lead in CanSat Competition 2015 organized by American Astronautical Society (Mission:Auto-Gyro, team ranked under top 10 in final round)
- **Hobbies**: Trekking, shuttle sports, chess, popular science books, scientific writing

Schools and Conferences

- 29th Texas Symposium on Relativistic Astrophysics, Dec 2017 in Cape Town
- 11th International Astronomical Consortium for High Energy Calibration, March 2016 in IUCAA, Pune
- Introductory Summer School of Astronomy and Astrophysics, June 2017 in IUCAA, Pune
- American Astronautical Society's CanSat Competition Burkett Texas Aug 2015
- Texas Instrumentation Innovation Challenge India Design ContestBangalore India, 2015

Publication

- Presented posters namely ”Testing Einstein-Dilaton-Gauss-Bonnet Black Hole in Strong Gravity” and ”X-ray Spectropolarimetric Observation of Black Hole Binaries to test the GeneralRelativity in Strong Gravity Regime” at 29th Texas Symposium on Relativistic Astrophysics
- Presented a talk on variation of House Keeping Parameters of ASTROSAT Observatory (CZTI Instrument) at 11th International Astronomical Consortium for High Energy Calibration (IACHEC)
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- Sharma, V.; Kumar, V.; Bhattacharya, D.; Bhalerao, V.; Rao, A. R.; Vadawale, S. 2016, GRB Coordinates Network, 20114, 1
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