Rahul **Ranjan**

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Interest

Machine Learning, Bioinformatics, Computer Vision, Natural Language Processing, Android & Web Development .

Publications

[1] Finding out the needy one from Tweets : An analysis using #kerelafloods
Rahul Ranjan (Author), Himangshu Sarma and Navanath Saharia
Presented the Paper in 3^{rd} International Conference on Contemporary Computing and Informatics (Gurgaon, India), 2018 - IEEE Delhi Section.
[2] A speech-based driver assisting module for Intelligent Transport System
Himangshu Sarma, **Rahul Ranjan** and Navanath Saharia
Presented the Paper in 3^{rd} International Conference on Contemporary Computing and Infor- matics (Gurgaon, India), 2018 - IEEE Delhi Section.
[3] Estimating the severity of road traffic accidents using deep learning
Rahul Ranjan and Dr. N. Kishorjit Singh
Paper selected for presentation in Larix international Annual Summit on Artificial Intelligence and Machine Learning 2020, to be held in February 26-27 in Dubai UAE.

Experience and Research Projects

Estimating the closest taxon pairs in multiple sequence alignment using deep learning

Max Perutz Labs, University of Vienna, Austria

Summer Research Intern | Guide : Prof Arndt von Haeseler — *Summer 2019*

- Worked on estimating the closest taxon pairs in multiple sequence alignment using deep learning. This model is implemented for the newick tree of 4-taxon and 8-taxon which contained 0.1 million and 10k tree respectively
- Implemented various deep learning architectures such as LSTM, GRU, CNN and applied CUDA deep neural network with LSTM and GRU and the multiple sequence alignments were generated using a sequence generation tool called *seq-gen*.
- Improved accuracy and efficiency of existing algorithm for phylogenetic tree re-construction based on maximum likelihood.
- Implemented the current state-of-the-art algorithm using Google's **BERT** deep-learning based Natural Language Understanding model using **Transformer** architecture based on self-attention.

Estimating the severity of road traffic accident using deep learning based on code-mixed data

IIIT Manipur, India

Research Project (Bachelor's Thesis) | Guide : Dr N. Kishorjit Singh — *August 2019 - Present*

- Implemented Machine learning and deep learning algorithms to estimate the severity of road traffic accidents based on textual and satellite images of the accidents location.
- Designed and implemented various machine learning and deep learning algorithms from scratch to improve the model's performance.
- Analysed and compared the performance of deep learning models with pre-trained models such as ImageNet, Alexnet, VGG-16 and ResNet.
- Working on implementing this for code-mixed data to enhance model's performance on estimating the severity of road traffic accidents.
- Webpage is designed for proper visualisation of road accidents prone zone and predicting the severity of road traffic accidents.

FOSSASIA

Singapore

Open Source Developer — *Fall 2018 - Present*

- A regular & active contributer at FOSSASIA using GitHub.
- Contributed to various FOSSASIA projects such as Open-event frontend, SUSI.AI, phimpme-android, openevent-android,loklak,etc.
- Attended events of FOSSASIA & other Open-source community at several places and based on contribution, invited to attend FOSSASIA Summit 2019.

Building and Using Comparable Corpora for Machine Translation

IIT BHU, Varanasi, IN

Summer Research Intern — *Summer 2018*

- Worked as a Summer Research Intern in the Natural Language Processing lab, Department of Computer Science, Indian Institute of Technology BHU
- Worked on building a machine learning tool to design and build the Parallel Corpus from Comparable Corpus for Machine Translation.
- Implemented a variant of Gale and Church algorithm for sentence alignment based on input comparable corpus for finding the solutions the problem.
- To make a Parallel Corpus from a Comparable Corpus obtained from wikipedia dumps for HungarianEnglish Language.
- Implemented Support Vector Machine, Logistic Regression and Random Forest Classifier to achieve an accurate model.

Finding out the needy one from Tweets : An analysis using kerelafloods

IIIT Manipur, India

Project Assistant | Guide : Dr Navanath Saharia — *August 2018 - Jan 2018*

- Implemented a Machine learning tool to Identify relevent words from Tweets to help People during disasters (flood).
- Implemented Topic Modelling to assign topics to each hashtags used during flood, implemented K-Means and LDA to help NGOs, Government agencies to help People in kerala during this destructive flood situation.
- The system was further improved by implementing for indigenous people, it collects tweets based on various regional languages and translates local regional tweets into english as standard language.
- Webpage is designed for proper visualisation of hashtags and information gathered from the tweets during disasters.

Hasura.io & Internshala *Delhi, India*

Student Advocate *August 2017 - Feb 2018*

- I was a Student Advocate (from December to February, 2018) for IMAD , Hasura.With their help and significant contribution, IMAD became the largest MOOC in India with 250,000+ registrations.
- I was responsible for interacting with both professors and students, actively promoted the course on social media and spread awareness about the course.
- I was responsible for promoting Internshala and its products and was able to complete it successfully and showed genuine sincerity and willingness to learn while taking on new assignments and challenges.

Key Projects

A Machine Learning approach for predicting Coronary Heart Disease using Risk Factors *IIIT Manipur, Imphal, India*

Research Projects | Guide : Dr N. Kishorjit Singh *Jan 2019 - April 2019*

- Implemented Machine learning and deep learning algorithms to predict the chances of Coronary heart disease using risk factors basedon dataset from UCI Machine Learning Repository.
- Studied and considered various risk factors such as age, sex, height, weight, heart rate, etc.
- The System is trained on the dataset by applying classifiers such as Logistic regression, SVM, random forest, XGBoost etc. to predict other types of CHD (such as Tachycardia, Bradycardia and Coronary artery diseases using ECG signals) to make it more efficient.
- The model was further improved by implementing deep learning architectures such as CNN, LSTM, Bi-LSTM and GRU.

Sentiment Analysis for racist/provocative words identification from Tweets *IIIT Manipur, Imphal, India*

Distributed System | Guide : Dr Himangshu Sarma *July 2018 - November 2018*

- Implemented Machine learning algorithms on detecting the hate speech containing Tweets.
- Implemented a Hadoop file system to collect the tweets in real time to predict the provocative tweets.
- Machine Learning algorithms were used (SVM, Logistic Regression, random forest, decision tree, etc) to obtain an accurate system.

Appointment Management System (Android) *IIIT Manipur, Imphal, India*

Database Management | Guide : Dr Navanath Saharia *Jan 2018 - April 2018*

- The proposed system was built as Android Application which will read the received messages from android device and extract the date and time or words like tommorow , yesterday,etc. from messages.
- The Application will Store these time and dates in the database and manage appointment calendar for you.

Library Management System & TnP Website (Web) *IIIT Manipur, Imphal, India*

Academic Project | Guide : Dr. Thoudam Doren Singh *Jan 2018 - April 2018*

- Built Training and Placement Cell Website of IIIT Senapati.
- Implementation of Library Management software which contains all features for proper operation of the Library.
- The Application will Store these time and dates in the database and manage appointment calendar for you.

For more information about projects please visit my website.

Education

Indian Institute of Information Technology Senapati, Manipur* *Imphal, India - 795002*

B.Tech in Computer Science & Engineering (SPI - 8.4/10.0) *2016 - 2020*

* An Institute of National Importance by the act of Parliament

Key Skills

Programming Languages: Python[Fluent], C++, C, Java[Familiar], JavaScript, Bash, PHP, MATLAB
Web Development: HTML, CSS, FLASK, BootStrap, EmberJS, JQuery, Node.js, Django, PostgreSQL, Git, Android
Deep learning (advanced): Python (+ NumPy), OpenCV, PyTorch, scikit-learn, Tensorflow, Keras, Fast.ai

Scholastic Achievements & Extracurriculars

- Among top 30 students got selected for VBC Summer School out of 1748 students from 121 countries.
- 1st runner-up in UNESCO FOSSASIA Hackathon held at LifeLong Learning Institute ,Singapore themed on supporting Indigenous Languages.
- Amongst the National top 3% in JEE Mains conducted by CBSE.
- Won (OpenTechNight) prize, for being among top contributor to FOSSASIA.
- Rated Programmer on Competitive Programming Sites.
- Selected for HPAIR in Technology Innovation track and invited for a talk at Malaysia Harvard University (Boston, M.A.)
- Secured All India Rank 12 in Essay Competition by GK-Today.
- Received 3 Summer Internship Offers from IITs (in 2018) to Work in the field of Machine Learning.
- Received Certificate of Excellence in C, C++, Linux, Java LATEX organised by IIT Bombay.
- Among the Board members of Innovation club and part of Clean India Mission, IIIT Manipur.
- Among the best Athlete in High School.