Raman Dutt

Curriculum Vitae

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WORK EXPERIENCE

JUN 2020 - PRESENT (FT)

Healthcare Innovations and Translational Informatics (HITI) Lab @ Emory University
Research Assistant

1. Implemented an ROI-extraction pipeline using object localization algorithms and a brand classification pipeline using Multi-View CNNs to classify cervical spine-hardware brand in chest X-rays with **Dr. Hari Trivedi**. Initial results submitted in AAOS-2021.

2. Implemented different ensembling techniques to study the factors affecting the generalizability of Deep CNNs on open chest radiograph datasets such as CheXpert, ChestX-ray14, and MIMIC Chest X-ray JPG with **Dr. Imon Banerjee** and **Dr. Judy Gichoya**. Conducted different statistical tests for interpreting the results and understanding their distribution.

3. Performed **GAN augmentation** and **progressive resizing** for identification of Melanoma in lesion images. Secured a rank in the top 10% on the global leaderboard.

DEC 2019 – JUNE 2020 (FT)

TavLab @ IIIT-Delhi
Research Intern

1. Implemented image and video classification models (2D, 3D CNN and CNN+LSTM) to predict Hemodynamic shock from thermal images and videos with Dr. Tavpritesh Sethi in Collaboration with clinicians from AIIMS, New Delhi.

2. Developed an interpretability pipeline for Deep CNNs using **Grad-CAM and Integrated Gradients** algorithms.

3. Wrote scripts to organize and structure the flow of data across different servers.

MAY 2019 – JULY 2019 (FT)

Computational Biology Lab @ IIIT-Delhi
Research Intern

1. Implemented Bagging, Boosting, Voting and Cascaded-classifiers for classification of allergenic protein sequences for the AlgPred Webserver under Dr. GPS Raghava.

2. Performed dimensionality reduction, single-class classification, out-of-distribution detection and interpreting feature importance scores for genomic sequences. Paper published in Briefings in Bioinformatics.

POSITIONS HELD

1. President - Association for Computing Machinery (ACM) Campus chapter
2. Student Lead - Developer Student Club (DSC), Shiv Nadar University by Google Developers

EDUCATION

2016 – 2020 **Bachelor of Technology**
DISTINCTION, (8.72/10)
Computer Science and Engineering
Shiv Nadar University

AWARDS

2019	**Gesellschaft Deutscher Chemiker Scholarship**
2019	**Winner, Smart India Hackathon**
2019	**Winner, Hack2Hire Hackathon**
2017	**Winner, HackData**
2017-2019	**Dean's List felicitation**
2016-2020	**Shiv Nadar Foundation Scholarship**
2016	**AIR - 3, National Astronomy Olympiad**
2016	**AIR - 3, International Olympiad of Science**

PUBLICATIONS

1. Medical Imaging

Early Prediction of Hemodynamic Shock in the ICU with Deep Learning on Thermal Videos. **[*Submitted, Nature Medicine*]**, (2020), [Medrxiv]

Generalization of Deep Convolutional Neural Network - A Case-study on Open-source Chest Radiographs. **[*In Submission*]**, (2020), [Arxiv]

A Deep Learning Model for Detection of Cervical Spine Hardware on Radiographs. **[*Submitted, AAOS-2021*]**, (2020)

2. Chemical Informatics

Drug Activity Prediction using Capsule Networks and Dynamic Routing Algorithm **[*15th German Conference on Cheminformatics*]**, (2019)

Application of Capsule Networks and Chemical Space Networks in Cheminformatics **[*15th German Conference on Cheminformatics*]**, (2019)

Rethinking Model Architecture and Pretraining for Visual Tasks in Cheminformatics **[*In Submission*]**, (2020)

3. Patent Analysis

Novel Mixed-Encoding for Forecasting Patent Grant Duration [***World Patent Information, Special Issue: Artificial Intelligence for Intellectual Property***], (2020), [Paper]

Forecasting the Grant Duration of a Patent using Predictive Analytics **[International Journal of Computer Applications (IJCA), [Paper]**