ROHAN PANDEY

pandeyrohan | rp153@snu.edu.in | rohanpandey.github.io | Scholar

EDUCATION

Shiv Nadar University, Greater Noida, India **August 2017 - June 2021**
Bachelor of Technology, Computer Science (High Distinction) **CGPA: 9.07/10**

PUBLICATIONS

- **A Machine Learning Application for Raising WASH Awareness in the Times of COVID-19 Pandemic**. ***Rohan Pandey****, *Vaibhav Gautam, Ridam Pal, et al.*
  Nature, Scientific Reports (Oct 2021). [Paper Link]
  - Proposed a machine-learning pipeline for matching WHO healthcare guidelines with news articles to augment user's daily news consumption using word embeddings, summarization algorithms, and distance metrics.
  - Doubled the relevance of AI-filtered content within 45 days of continuous machine learning.
- **(Un) Masked COVID-19 Trends from Social Media**. *Asmit Kumar Singh*, Paras Mehan*, Divyanshu Sharma*,* ***Rohan Pandey****, Tavpritesh Sethi, Ponnurangam Kumaraguru.*
  JMIR Public Health and Surveillance (Aug 2021). [Paper Link]
  - Analyzed 2.04 mil social media images to quantify face mask usage and its correlation with COVID cases.
  - Proposed a framework for classifying masked/unmasked faces and calculating the mask-fit score, both models trained achieved a test accuracy of 98%.
  - Released two new datasets: VAriety MAsks - Classification (VAMA-C) [Link] and VAriety MAsks - Segmentation (VAMA-S) [Link] for mask detection and mask fit analysis tasks, respectively.
- **Explainable deep learning framework for differential diagnosis of COVID-19 using chest X-Rays**. *Rajeev Kumar Singh*,* ***Rohan Pandey**** *and Rishie Nandhan B*.*
  Neural Computing and Applications (Jan 2021). [Paper Link]
  - Developed a novel pruned meta-learning algorithm for differential pathology diagnosis from chest X-rays.
  - Evaluated state-of-the-art GAN architectures (Wasserstein GAN, least squares GAN, auxiliary classifier GAN, and deep convolution GAN) to generate synthetic samples of COVID-19 chest X-rays.
  - The proposed solution achieved state of the art performance with 98.67% accuracy and 0.98 Kappa score.
- **Cervical Cancer Diagnosis using CervixNet - A Deep Learning Approach**. *Rohan Gorantla*, Rajeev Kumar Singh*,* ***Rohan Pandey**** *and Mayank Jain**
  2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BIBE). [Paper Link]
  - Developed a deep learning-based image segmentation and classification pipeline for Cervical Cancer diagnosis based on a novel hierarchical classification method to combine multiple CNN models.
  - Proposed methodology achieved state of the art accuracy of 96.77% and a kappa score of 0.951.

(* = equal contribution)

EXPERIENCE

McKinsey & Company January 2021 - Present
Junior Engineer
- Responsible for the development and deployment of Orpheus product line (ML-powered large scale spend analytics) on cloud platforms for numerous clients.
- Reduced infrastructure query resolution time by 25% and client infrastructure delivery time by 80%.
- Fastracked to leadership responsibilities including stakeholder and OKR management, component ownership and team management, hiring and interviewing new personnel.

HITI Lab, Emory University September 2020 - Present
Machine Learning Research Intern
- Implemented 2-D segmentation models (U-Net, SegNet, and U-Net++) to obtain the liver from MRI's for detection of Hepatocellular Carcinoma, achieving a test dice score of 0.91 and IoU of 0.84. *Work in submission.*
- Working on a multi-modal machine learning model to predict central line operation of an admitted patient 24 hours in advance.

TavLab, IIIT Delhi May 2019 - October 2020
Machine Learning Research Intern

- Worked on research in deep learning for medical and societal AI – culminating in two publications listed above.
- Created WashKaro, a multi-pronged intervention for mitigating misinformation through conversational Artificial Intelligence (AI), machine translation and natural language processing (NLP). (5000+ downloads) [Link].

PROJECTS

Generalizing CNNs for Chest X-Rays [Link]
- Trained multiple combinations of state of the art architectures (Xception, InceptionV3, ResNet50) for the detection of Pneumonia in Chest X-rays.
- Evaluated different architectural choices in CNNs to study their effect on model generalization to external datasets. (Varying Dense layer size, Dropout, Regularization, Batch Normalization, and Max/Avg Pooling)

Human Activity Prediction [Link]
- Implemented clustering algorithms (K-means and Agglomerative) for identifying groups within 18 different human activities using sensor data from smartphone and smartwatches.
- Trained LSTM models (Stacked, Vanilla, and Bi-directional) to predict the sensor readings for the last minute of activity, achieving a lowest MAE of 0.090 and RMSE of 0.013.

Social Media Analyzer [Link]
- Created a web application that allows users to aggregate insights from public social media profiles before commencing online engagement.
- Provided the sentiment and labels associated with the text-based posts and used object detection to provides the labels/objects associated with the images.

Intelligent Games: Soduko and Tic-Tac-Toe
- Developed an AI based Tic-Tac-Toe game using magic square based game playing strategy. [Link]
- Developed a sudoku solver which uses constraint satisfaction and backtracking. [Link]

RELEVANT COURSEWORK

Undergraduate
CSD429 Research Methods in Computing (A)
CSD311 Artificial Intelligence (A)
CSD314 Machine Learning (A)

Certifications
Machine Learning (Coursera) [Link]
Deep Learning Specialization (Coursera) [Link]

ADDITIONAL EXPERIENCE AND ACHIEVEMENTS

Teaching Assistant
- **CSD101: Introduction to Computer Programming (Spring 2020)**
  - Responsible for undertaking the lab, evaluating assignments and tests for 70+ students.
- **CSD428: Software Project Management (Spring 2021)**
  - Responsible for mentoring 50+ students on their course project from ideation to final presentation.
- **CSD311: Artificial Intelligence (Fall 2021)**
  - Responsible for creating graded lab assignments, undertaking the lab and grading for 120+ students.

Awards
- **Dean's list Awardee** in 2018, 2019, and 2020 for academic excellence (top 10% of School of Engineering).
- Awarded **90% Scholarship** at Alma Mater(Shiv Nadar University) throughout the four years of the program.
- Reached the **top 10/2000** teams of the ZS Campus Beats Case Challenge India 2020.

Positions of Responsibility
- Elected as **Class Representative** of Department of Computer Science (Class of 2021).
- Elected as **Secretary - ACM Shiv Nadar University Chapter**.
- Active member of **Academic Affairs** committee and **Student Council** at Shiv Nadar University.

Community
- Discussant for **Uncertainty in AI (UAI-2021)** - lead discussion of the paper titled "Classification with abstention but without disparities".
- Volunteer for **International Conference on Machine Learning ICML 2021**.

TECHNICAL STRENGTHS

Languages: C, C++, Python, Java, Matlab, R, SQL
Technologies: MS Office, Latex, Github, Gitlab, Docker
Libraries: Tensorflow, Pytorch, Keras, NLTK, OpenCV, Pandas, Numpy