SUMIT PANDEY

RESEARCH ASSISTANT
DEEP LEARNING

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PERSONAL PROFILE

A Deep Learning researcher with holistic knowledge of end-to-end Deep Learning /Machine Learning web application development and design, also experienced in embedded system programming.

EMPLOYMENT HISTORY

RESEARCH ASSISTANT, MRI LAB, CHANG GUNG MEMORIAL HOSPITAL, LINKOU (TAIWAN)
October 2020- Present

- Image to image translation (MRI to CT) using pix2pix GAN and cycle GAN.
- Cancer segmentation task (MRI to CT) using Deep Learning (CNN, GAN, U-Net).

GRADUATE RESEARCH ASSISTANT, CREST, CHANG GUNG UNIVERSITY, TAOYUAN (TAIWAN)
FEBRUARY 2018- JUNE 2020

- Published 2 SCI indexed Journal papers and 2 IEEE international conference papers in predictive maintenance (Regression, Classification and Time series Analysis).
- Predictive and Reliability analysis of industrial equipment (planted in Formosa corporation)

GRADUATE RESEARCH ASSISTANT, DRY LAB, CHANG GUNG MEMORIAL HOSPITAL, LINKOU (TAIWAN)
NOVEMBER 2018- JUNE 2020

- Flu-classification using Deep Learning (RNN).
- Pneumonia Chest X-ray Classification using ResNet-50 (CNN).

RESEARCH INTERN, CREST, CHANG GUNG UNIVERSITY, TAOYUAN (TAIWAN)
September 2017- JANUARY 2018

- Predictive Analysis and Maintenance system for Haemodialysis machine
- Project realted to Pulse Oximeter for low SpO2 Detection.

RESEARCH INTERN, MAHARAJA AGRASEN COLLEGE, UNIVERSITY OF DELHI ,INDIA
JANUARY 2016- August 2017

- Swarm based terrain profiler.
- Collaborated with other designers.
- Translated requirements into polished, high-level designs

EDUCATION

UDACITY DEEP LEARNING NANODEGREE, UDACITY INC.

December 2020- April 2021

- Completed four projects related to ANN, CNN, LSTM and GAN.

CHANG GUNG UNIVERSITY, TAOYUAN (TAIWAN)

Master of Science | FEBRUARY 2018- JUNE 2020

- GPA: 3.78/4.0
- Completed projects in Data Science (predictive maintenance), Deep Learning (CNN and LSTM).
- My thesis involved studying Machine Learning-Based Prediction and Analysis Algorithms.

UTTARAKHAND TECHNICAL UNIVERSITY, (INDIA)

Bachelor of Technology | JUNE 2012- JUNE 2016

- Percentage: 68%
- Published 1 IEEE conference paper and 4 National conference papers.
- My thesis involved the design of an automatic embedded system that can alert driver and guard during fire accidents in train.

RESEARCH PAPERS

JOURNAL PAPERS

- Cher Ming Tan, Udit Narula, Lu An Lai, Sumit Pandey, Jung Hua Tung, Chung Yi Li, ***"Optimal Maintenance Strategy on Medical Instruments used for Haemodialysis Process"***, Eksploatacja I Niezawodność - Maintenance And Reliability accepted on February 2019.
- Sumit Pandey, Cher Ming Tan, Hsiao-Wen Chen, Yao En Xie, Jung Hua Tung, Yu-Chuan Kau, Chia- Chih Liao. '***Pulse Oximeter for Low SpO2 Level Detection Using Discrete-Time Signal Processing Algorithm',*** Journal of Medical Devices, Transaction of ASME (American Society of Mechanical Engineers)

CONFERENCE PAPERS

- Sumit Pandey, Abhishek Mishra, Sandeep Sharma. "***Automatic Fire Initiated Braking And Alert System For Trains***" presented at Second IEEE International Conference on *Advances in Computing and Communication Engineering ICACCE 2015* and published in the conference proceeding ISBN-13: 978-1-4799-1734-1 and also published in IEEE explore.
- Tan Cher Ming, Udit Narula, Lu-An-Lai, Sumit Pandey, Zung Hua Tung, Chung Yi Li "***An Illustration of Predictive Maintenance on Medical Instruments using Haemodialysis Machines***", ANQ *Congress-2018 (Asian Network Quality, 19-20th September 2018, held in Almaty, Kazakhstan*) (**Selected as the best paper**)
- Sumit Pandey, Amrindra Pal, Sandeep Sharma., "***Smart Automatic News Paper Vending Machine Controller Ic***" Proceedings of *National Conference on Striving and Thriving towards the diffusion of student-driven research in science and technology for inspired learning*, ISBN: 978-81-7273-958-4
- Praveen Kant Pandey, Maneesha, Sandeep Sharma, Vivek Kumar, Sumit Pandey, "***An Intelligent Terrain Profiling Embedded System for Underwater Applications***" presented at 2018 *4th International Conference on Computational Intelligence & Communication Technology (CICT)* and published in the conference proceeding and IEEE Xplore, DOI: 10.1109/CIACT.2018.8480329.

PROJECTS

FLU CLASSIFICATION.

- Used LSTM and RNN for classification Flu influenza from Normal people.
- Achieved 80% AUC on the training dataset, 78% AUC on the testing dataset, and 76% AUC of the validation dataset.

ABDOMEN AORTA SEGMENTATION IN ULTRASOUND IMAGES USING PIX2PIX GAN AND U-NET ARCHITECTURES.

- End to end deep learning project for Aorta segmentation using Pix2Pix GAN and U-Net
- 99% of AUC and 96% of SSIM for testing dataset

COVID-19 AND PNEUMONIA CLASSIFICATION IN FRONT END CHEST X-RAYS

- Kaggle dataset that contains chest X-ray images was used in this work and then ResNet-50 was used to classify these images.
- Used six Deep Neural Network Architectures ie. ResNet-50, ResNet-34, achieved 99 % of accuracy to deect COVID-19 chest X-rays

IMAGE TO IMAGE TRANSLATION BRIAN MRI TO CT

- Translated the brian MRI image to CT image using pix2pix GAN.
- Finally the average SSIM of 88% on testing dataset was acheived.

PLANT PATHOLOGY 2021 - CHALLENGE (ON GOING)

- All the apple leaves images divided into 12 classes (11 diseases and healthy).
- The dataset was divided into 2 parts (training and testing, 90:10 ratio), trained over a CNN with 12 hidden layers. The AUC of training data: 82% and for testing data: 79.5%.

EXTRA COURSES IN DEP LEARNING

- “6.86x: Machine Learning with Python-From Linear Models to Deep Learning”, Massachusetts Institute of Technology.
- “Neural Networks and Deep Learning”, DeepLearning.ai
- “Improving Deep Neural Networks: Hyperparameter tuning, Regularization, and Optimization”, DeepLearning.ai
- “Convolutional Neural Networks”, DeepLearning.ai
- “Structuring Machine Learning Projects”, DeepLearning.ai
- “Sequence Models”, DeepLearning.ai
- “Introduction to TensorFlow for Artificial
- Intelligence, Machine Learning, and Deep Learning”, DeepLearning.ai

SKILLS AND TOOLS

Python, MATLAB, NumPy, TensorFlow, Scikit-learn, Pytorch, Swift, Julia, Microsoft office, Arduino, Raspberry-pi, LATEX (OVERLEAF)

LANGUAGES

Hindi, English, Sanskrit, Mandarin (Survival), Kumaoni