Manish Gawali

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EDUCATION

Pune Institute of Computer Technology, Pune, India 2014 – 2018
Bachelor of Computer Engineering [Distinction] ***GPA : 9.2/10***

TECHNICAL SKILLS

Languages: C, C++, Python, C#, Embedded C, R, Javascript, HTML, CSS, Java, PL/SQL, PHP, LaTex
Frameworks: Flask, ASP.NET, Node.js, Firebase, Bottle
Developer Tools: Git, Docker, Google Cloud Platform, VS Code, Visual Studio, PyCharm, Eclipse, Android Studio
Libraries: TensorFlow, Keras, PyTorch, OpenCV, Pandas, NumPy, Matplotlib, p5.js

WORK EXPERIENCE

Associate Data Scientist (Project Lead, Researcher, and Mentor) August 2020 – Present
DeepTek Medical Imaging Pvt Ltd. | Technolgies Used : Python, PyTorch, Tensorflow, Docker *Pune, India*

- **Led** the research team of 3 data scientists and 2 researchers for the collaborative project: Privacy-Preserving Distributed Deep Learning between DeepTek and SBIC (Singapore Bioimaging Consortium) - A*Star.
- Conducted research, contributed to the ***Privacy-Preserving Distributed Deep Learning*** field in the form of a research paper. Proposed a novel distributed deep learning method called ***SplitFedv3*** and a novel distributed model training approach known as ***Alternate mini-batch training***. Moreover, comparison of Federated Learning, Split Learning, and SplitFed variants was done for healthcare domain.
- Overlooking ongoing and newly established research operations, literature review, scientific writing comprising of research papers, white papers and blogs.
- Developed a new methodology which segments out lungs and heart for calculation of cardiothoracic ratio (CTR) for detection of cardiomegaly in chest X-rays.
- Developed 10+ deep learning models for detection of pathologies like Pleural Effusion, Fractures, and Tuberculosis etc. from chest X-rays and productionized them.
- **Mentored** an intern for his master's thesis research work which involved demonstrating a flaw in ***Split Learning***
- Built an UI tool using p5.js and node.js and carried out controlled experiments with 5 radiologists to measure if AI helped improve the productivity and diagnostic accuracy. Statistical analysis and hypothesis testing was done.
- Designed pipelines for image classification, segmentation, object detection (Mask-RCNN and YOLO architectures), anomaly detection algorithms (OneClassSVM and AutoEncoders).
- Contributed to 3 research papers which will be presented at international conferences, 1 research paper which is in a journal revision process and 1 research abstract which is in review process at a reputed radiology conference.
- Integral member of the recruitment team, managed a recruitment drive, screened 1500+ resumes and conducted 20+ interviews, hired and trained new joinees.
- **Leading** a team of 3 data scientists for developing end-to-end ML workflows for pathology detection in CT model research, optimization, and engineering activities.

Associate Consultant (Deep Learning) January 2020 – July 2020
AlgoAnalytics Pvt. Ltd.| Technolgies Used : Python, Flask, Keras *Pune, India*

- Developed a novel variant of DCGAN (Deep Convolutional Generative Adversarial Network) architecture for generating handwritten signatures using the GPDR-960 handwritten dataset.
- Implemented end-to-end client-facing Fashion AI application for Virtual Try-On using Python, Flask.

Associate Software Engineer July 2018 – July 2019
Veritas Technologies LLC | Technolgies Used : C++, C#, ASP.NET, SSMS *Pune, India*

- Developed multiple features like Auditing Enhancements, Cloud-SQL to enhance the product Enterprise Vault.
- Developed multiple features like Hotword Statistics, Hotword and Hotword Set Facet for the product Compliance/Discovery Accelerator.
- Contributed to 8 winning POC's and rectified 30+ bug fixes.
- Optimized legacy code to increase the speed of operations like archiving e-mails and file shares by 20%.

PROJECTS

Human Activity Recognition | *Python, Pandas, Keras* October 2019 – December 2019

- Built a deep learning model that predicts the human activities such as walking, walking upstairs, walking downstairs, sitting, standing or laying in a video. Dataset used- UCI HAR Dataset.
- Compared models built using traditional ML algorithms trained upon 561 hand-coded features and deep learning models built using raw data.
- Deep Learning LSTM models performed way better than ML models with the best LSTM model having a test accuracy of 97.16%.

Chatbot (ML intern at GS Lab) | *Python, Flask, HTML, CSS, Javascript, Git* August 2017 – March 2018

- The chatbot aims to reduce the human intervention in the long and tedious process one has to face while contacting the support team regarding a query of the product. The chatbot parses a user manual of a particular product and uses it as training data to learn important information and subsequently answers the queries of the customers.
- Built the backend ML pipeline using concepts like TF-IDF, Clustering, Cosine similarity and interactive user interface which allows users to create unique profiles and ask questions to the chatbot.

eYantra | *C++, Embedded C, Python* August 2016 – March 2017

- Co-ordinated the synchronous motion of two FirebirdV Atmega2560 robots by building path planning algorithms, to match the musical notes extracted from audio files by striking steel rods at specific nodes of the graph.
- Wrote an algorithm in the form of a python script to process audio files and generate corresponding musical notes.
- Designed and implemented a path planning algorithm so that the two robots can traverse on a labyrinth-like graph with obstacles present in it.

PICT Connect | *Java, PHP, Android Studio, Firebase* July 2016 – September 2017

- An android application for uploading and downloading notices regarding events, workshops. Notices are further segregated based upon department, year for easy viewing and navigation.
- The application has been used successfully by students of PICT college.

PUBLICATIONS

- "Comparison of Privacy-Preserving Distributed Deep Learning Methods in Healthcare". (Accepted for oral presentation at MIUA 2021 : Ranked 34th in Biomedical and Medical Informatics, 75th in Image Processing and Computer Vision, 128th in Machine Learning and Artificial Intelligence)
- "Deep Learning Models for Calculation of Cardiothoracic Ratio from Chest Radiographs for Assisted Diagnosis of Cardiomegaly". (Accepted for oral presentation at icABCD 2021)
- "Vulnerability Due to Training Order in Split Learning". (Accepted for oral presentation at ICT4SD 2021)
- "Key Technology Considerations in Developing and Deploying Machine Learning Models in Clinical Radiology Practice". (Accepted, revisions submitted to journal: JMIR Medical Informatics, Top tier journal : Top 5%)
- "Accuracy and productivity gains using AI". (In review process: RSNA 2021)

RESEARCH SERVICES

- **Reviewer** for Secure and Privacy-Preserving Machine Learning for Medical Imaging: MICCAI 2021 Workshop and Tutorial (Springer).
- **Reviewer** for 2021 International Conference on Artificial Intelligence and its Applications (icARTI 2021) (ACM).

EXTERNAL COURSEWORK

- Machine Learning by Stanford University (Coursera).
- Deep Learning Specialization by deeplearning.ai (Coursera).
- AI for Medical Diagnosis by deeplearning.ai (Coursera).
- Computer Vision Nanodegree (Udacity).

ACHIEVEMENTS

- Secured 3rd rank at state level in MBD Talent Search Examination 2008.
- Won the Under-17 SGFI Subroto Football Cup 2009 as part of Sagar Public School team.
- Reached the final round of eYantra Robotics Competition 2017, which was organized by one of the most prestigious universities in India, IIT Bombay.
- WOW (Winning our way) Level 1 Award 2019 in Veritas.