Name: Pravinkumar Kandhare
Curent location : San Francisco, CA

Education:
Ph.D. in Interdisciplinary Engineering, University of Alabama at Birmingham, USA (2021)
Master's in Computer Science, Texas A&M University-Commerce, USA (2013)
B. Tech in Computer Science, Shri Guru Gobind Singh Institute of Engg and Technology (2008)

Skills:
- Image and Signal processing
- Computer Vision
- Data Visualization
- Machine Learning
- Pattern Recognition
- TensorFlow, Keras
- Jupyter Notebook
- MNE, Fieldtrip, Free Surfer
- SciKit-Learn, Pandas, NumPy
- Slack, Trello, Jira
- MATLAB, Python
- C/C++
- Java
- LaTex
- SQL

Certifications:
- IBM Data Science Specialization
- Credential ID - JR5GCKT2GR62
- Data Science Methodology
- Databases and SQL for Data Sci- ence
- Applied Data Science Capstone
- Data Visualization with Python
- Machine Learning with Python
- Data Analysis with Python
- Python for Data Science and AI
- Tools for Data Science

Links:
- [Google Researcher Profile](#)
- [LinkedIn Profile](#)
- [IBM Data Science Specialization Certificate](#)

Coursework:
- Data Science
- Data Collection and Manage- ment
- Big Data Analytics
- Computer Vision
- Deep Learning
- Data Visualization

Summary:
- Accomplished Data Scientist with over 6+ years of extensive experience, specializing in research involving human subjects.
- possess a proven track record in architecting and implementing advanced machine learning pipelines to address complex challenges within the domains of business and healthcare.
- My skill set is underpinned by a robust foundation in mathematics and specialized expertise in medical image processing, biomedical signal processing, data visualization, predictive modelling, and software development utilizing Python and MATLAB.

- Strong math background with medical image processing and analysis, data visualization, predictive modeling and software development using Python and Mat- lab programming.

Professional Experience:

Dept of Neurology, University of CA, San Francisco, US   **Oct 2021 – Apr 2023**
Data Science Specialist
- **Medical Image Analysis:**
  - **Multi-hospital Brain Injury Study** - Conducted an in-depth study at the University of California, San Francisco, involving the analysis of 460 MRIs sourced from 10 different hospitals. Focused on patients in a coma post-cardiac arrest.
- **Medical Image Analysis:**
  - **Deep Learning for Small Airway Disease Prediction** - Spearheaded a project at the University of Alabama, Birmingham, leveraging deep learning to predict functional small airway disease regions in expiratory CT images associated with Chronic Obstructive Pulmonary Disease (COPD).
- **Medical Image Analysis:**
  - **Functional Connectivity in Epilepsy Patients** - Collaborated with the Department of Paediatric Neurology/Epilepsy at Children's of Alabama, employing MEG and MRI data to estimate functional connectivity between distributed brain regions.
- **Medical Image Analysis:**
  - **Chest X-ray Evaluation** - Conducted an assessment of normal and abnormal features on chest X-rays at the Division of Neonatology, University of Alabama, Birmingham. Particular focus on determining lung volumes, characterizing respiratory pathology, and quantifying its magnitude.
- **Medical Imaging Tools**: 3D Slicer, ITK-SNAP, Free Surfer, MRICron, FSL, ImageJ
- **Preferred Coding Languages**: Python, MATLAB
- Performing extensive data analysis of EEG and neuroimaging (MRI) data and modelling
- Performing data mining, develop algorithms, as well as analysis involving physiological and health records time-series as well as maintain the laboratory's computational infrastructure and analysis tools.
- Assisting in acquiring and maintaining data acquisition from multiple sources including multi-modal physiological time-series, neuroimaging, and electronic health records
- Developing innovative solutions for medical issues with different data science models and apply statistical modelling and machine learning to assist disease diagnosis and prognosis prediction.

Dept. of Pediatric Neurology/Epilepsy, Children's of Alabama   **Jan 2021 - Jul 2021**
Graduate Research Assistant
- Collaborating with an interdisciplinary team of clinicians and researchers to improve and accelerate the findings
- MEG and MRI data preprocessing, source localization, statistical analysis, and estimation of functional connectivity between distributed brain regions
- Developing Epileptogenic zone localization functional connectivity visualization GUI for resting state interictal MEG recordings
- Assessment of functional connectivity in the epileptic brain.

Dept. of Electrical and Computer Engineering, Birmingham, USA   **Jan 2020 - Apr 2020**
Teaching Assistant
- Assisting the professor with programming lab and homework preparation
- Tracking student progress and communicating with them to improve their learning process
- Grading homework, class assignments and exam monitoring
- Providing instructional guidance and explanation

UAB Lung Imaging Core Lab, Birmingham, USA   **June 2018 - Mar 2019**

Graduate Assistant
- Preprocessing computed tomography (CT) lung images
- Developing of 2D and 3D deep learning models to predict functional small airway diseases of COPD population
- Implementing image segmentation and image analysis algorithms for heart pictorial muscles segmentation

Division of Hematology & Oncology, Birmingham, USA   Sept 2016 - June 2018
Graduate Assistant
- Multidimensional breast cancer treatment data cleaning and preprocessing
- Developing a visualization software to understand population-level treatment sequencing for metastatic breast cancer
- Troubleshooting, debugging, maintaining and improving the existing software

Division of Neonatology, Birmingham, USA   May 2017 - Aug 2017
Graduate Assistant
- Development of Graphical User Interface for Chest Segmentation
- Write and maintain programming documentation
- Image enhancement and denoising on chest X-ray
- Evaluate the normal and abnormal features on chest X-ray to quickly determine lung volumes, the nature of respiratory pathology and it's magnitude

Projects:
Real-Time Bradycardia Event Prediction in Preterm Infants using Deep Learning
Jan. 2021 – July 2021
- Developing a data-driven approach to predict the significant clinical events (brady-
- cardia and desaturation) of premature infants using recurrent neural networks (Simple RNN, LSTM, GRU, BiL STM and Transformer).
- The early prediction of these events is essential for avoiding neuropsychiatric disorders and impaired cognitive functions in the long term.
- (The application of such development will improve clinical management decisions and is essential in saving the lives of premature neonates in intensive care units)
- Location Prediction on Noisy Trajectories using Deep Learning   Sept. 2019 – Apr 2020
- We proposed a novel target tracking algorithm for accurate and time-efficient prediction of the next trajectory location using deep neural network, trained on a large dataset of generic types of mathematical curves.
- This algorithm can be used for tracking various kinds of objects due to the model training on the database of generic types of curves rather than the model training of target specific database of trajectories.
- In addition, our developed databases of linear and nonlinear trajectories (upto second-order algebraic curves) could be used by research community for training and testing point-target tracking algorithms.
- Deep Learning Based Prediction Approach for Functional Small

Airway Disease Regions on 2-Dimentional (2D) CT Expiratory Images
Feb 2019 – Apr 2019
- The main goal was to develop cost time-efficient automated pipeline for extracting functional small airway diseased regions using machine learning and medical imaging.
- To predict the functional small airway disease mask, U-Net (CNN) architectural pipeline was built in python using Keras deep learning framework with TensorFlow backend.

3D and 2D Convolution Neural Networks for Predicting Jacobian Measure of Volume Change in Mild and Severe Chronic Obstructive Pulmonary Disease (COPD) Subjects
June 2018 – Dec 2018
- Image processing methods require two images (inspiratory CT and expiratory CT) to estimate Jacobian determinant mask image that measures of local lung expansion and contraction with respiration.
- We utilized only a single image (expiratory CT) to predict the Jacobian image in order to make our approach time and cost-efficient

- Deep learning pipeline development to predict the change in lung volume (between inspiration and expiration) using Jacobin metric on COPD – Gen dataset

Graphical User Interface: Visualization of Sequential Treatments in Metastatic Breast Cancer (MBC) for Improving Survival of Cancer Patients
Sep 2016 – May 2018
- Designed a novel treatment visualization tool in MATLAB for researchers and clinicians to visualizes the treatment sequencing of the Metastatic Breast Cancer(MBC) dataset.
- The main goal of this visualization tool is to understand the relationship between treatment sequencing and survival, which can be crucial in predicting optimal sequencing treatment for MBC patients.
- Graphical User Interface for Chest Segmentation using MATLAB   May 2017 – Aug 2017
- Image Processing automated algorithms to rapidly and quantitatively evaluate the normal and abnormal features on CXRs to quickly determine lung volumes, the nature of respiratory pathology and its magnitude.

Publications:

- Kandhare, P.G., Nakhmani, A., Sirakov, N.M., 2019. Predictions of Biomedical Signals using deep learning, 2021.(In Progress on 06/2021).
- Kandhare, P.G., Nakhmani, A., Sirakov, N.M., 2019. Deep learning for location predic- tion on noisy trajectories, 2020, Pattern Analysis and Application.(Under Review on 05/2021).
- Rocque, G.B., Gilbert, A., Williams, C.P., Kenzik, K.M., Nakhmani, A., Kandhare, P.G., Bhatia, S., Burkard, M.E., Azuero, A., 2020. Prior treatment time affects survival outcomes in metastatic breast cancer. JCO Clinical Cancer Informatics , 500–513, URL:https: //doi.org/10.1200/CCI.20.00008, doi:10.1200/CCI.20.00008, pMID: 32479187.
- Rocque, G. B., Kandhare, P G., Williams, C. P., Nakhmani, A., Azuero, A., Burkard, M. E., Forero, A. Bhatia, S., Kenzik, K. M., 2019. Visualization of Sequential Treatments in Metastatic Breast Cancer. JCO Clinical Cancer Informatics:4, 1-8, URL:https://doi.org/10.1200/CCI.18.00095.
- Gilbert, A., Kandhare, P., Nakhmani, A., Meersman, S.C., Garrett-Mayer, E., Kaltenbaugh, M., Burkard, M.E., Williams, C., Azuero, A., Bhatia, S., Kenzik, K., Rocque, G.B., 2019. Uti- lizing visualization to qualitatively evaluate electronic health record-derived database limitations. Journal of Clinical Oncology 37, 317–317, URL:https://doi.org/10.1200/JCO.2019.37.27_suppl.317.
- Kandhare, P.G., Nakhmani, A., Sirakov, N.M., 2019. Trajectory type prediction and multi-target tracking, 2019 SoutheastCon, pp. 1–6.
- URL:https://ieeexplore.ieee.org/document/9020381.
- Patel, T., Bodduluri, S., Anthony, T., Monroe, W., Kandhare, P., Robinson, J.P., Nakhmani, A., Zhang, C., Bhatt, S., and Bangalore, P. 2019. Performance Character- ization of Single and Multi GPU Training of U-Net Architecture for Medical Image Seg- mentation Tasks. In Proceedings of the Practice and Experience in Advanced Research Computing on Rise of the Machines (Learning). Association for Computing Machinery. URL:https://dl.acm.org/doi/abs/10.1145/3332186.3333152.
- Kandhare, P.G., Arslan, A.N., Sirakov, N.M., 2014. Tracking partially occluded objects with centripetal active contour. Math. Appl 3, 61–75.
- URL:https://core.ac.uk/download/pdf/30311763.pdf.

Poster Presentations:

- Rocque, G., Gilbert, A., Williams, C.P., Nakhmani, A.,Kandhare, P.G., Azuero, A., Bhatia, S., Kenzik, K.M. and Burkard, M.E., 2020. Abstract P2-15-05: Visualization of the rela- tionship between survival and sequential treatments in metastatic breast cancer.
- Bodduluri, S., Nakhmani, A.,Kandhare, P., Patel, T., Reinhardt, J., Wilson, C., Nath, H., Dransfield, M., Bhatt, S., 2019. CT-based airway surface area to volume ratio is associ- ated with lung function decline in chronic obstructive pulmonary disease (COPD), in: A98. PHENOTYPING COPD AND PREDICTING THE DISEASE PROGRESSION, American
- Thoracic Society. doi:10.1164/ajrccm-conference.2019.199.1_meetingabstracts.a2411.
- Bodduluri, S., Nakhmani, A., Kandhare, P., Patel, T., Gerard, S., Rein- hardt, J., Wilson, C., Bhakta, N., Castaldi, P., McDonald, M.L., Bangalore, P., Anthony, T., Nath, H., Drans- field, M.,

Bhatt, S. Prediction of emphysema and airway disease from spirometry using neural networks, in: D94. COPD: EPIDEMIOLOGY AND THERAPY, American Thoracic Society. doi:10.1164/ajrccm-conference.2019.199.1_meetingabstracts.a7039.

- Kandhare, P.G., Sirakov, N.M., Modified Kalman method and shells for the target de- tection in tracking, 2013. The Texas A&M University System 11 th Annual Pathways Student Research Symposium, Kingsville, Texas, USA.
- Kandhare, P.G., Sirakov, N.M., Tracking a single object with a shrinking active contour & modified Kalman Filter, 2012. Annual Research Symposium, Texas A&M University-Commerce, Commerce, Texas, USA.
- Kandhare, P.G., Sirakov, N.M., Kalman filter object-tracking approach using shrinking active contour as measuring tool, 2012. Open Conference System, 10th Annual TAMUS Pathways Student Research Symposium, Galveston, Texas, USA.

Oral Presentations:

- Kandhare, P.G., Nakhmani, A., Sirakov, N.M., Multi-target trajectory tracking of cells, 2019, 35th Southern Biomedical Engineering Conference, University of Mississippi Med- ical Center, Jackson, MS, USA.
- Kandhare, P.G., Sirakov, N.M., Modified Kalman Filter Integrated with Shrinking Active Contour for Object Motion Tracking in Video, 2013, 93rd Texas Mathematical Associa- tion of America Section Meeting, Texas Tech University, Lubbock, Texas, USA.
- Kandhare, P.G., Sirakov, N.M., Tracking a Single Object in Video Sequence, Annual Re- search Symposium, 2013, Texas A&M University-Commerce, Commerce, Texas, USA.