­­Kathan Vyas

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Education

* **PhD in Computer Science** Sept 2021 -

Texas A&M University, College Station, TX

* **Master of Electrical and Computer Engineering (Masters-Thesis** **Track)** May 2021

Northeastern University, Boston, MA **(GPA: 3.9/4)**

* **Master of Professional Studies (MS): Informatics (Concentration: Data Analytics and** **HCI)** April 2018

Northeastern University, Boston, MA **(GPA: 3.7/4)**

* **Bachelor of Engineering: Information Technology (CGPA: 8.65/****10)** May 2015

Gujarat Technological University, Gujarat, India

Publications and Thesis:

* **Conference: IEEE Body Sensor Networks, Cambridge, Massachusetts** (Oct 2023)
  + “Detection of glycemic excursions using morphological and time-domain ECG features”
  + Collaboration: Texas Children Hospital – Baylor College of Medicine
  + In press
* **Conference: IEEE Computing in Cardiology (CinC)** (Sept 2022)
  + “Murmur Detection Using Ensemble of Deep Learning Classifiers for Phonocardiograms

Recorded from Multiple Auscultation Locations”

* + Collaboration: Edwards LifeSciences
  + Published ([link](https://ieeexplore.ieee.org/abstract/document/10081749/))
* **Graduate Thesis**  **(**May 2021)
  + “Data Efficient Analysis of Human Behavior by Spatio-Temporal Pose Generation and Inference”
  + Published ([link](https://search.proquest.com/openview/6409f23924ab38217733547d31b4c7da/1?pq-origsite=gscholar&cbl=18750&diss=y))
* **Conference: Computer Vision and Pattern Recognition (CVPR) Workshop, Virtual**  **(**March 2021)
  + “An Efficient 3D Synthetic Model Generation Pipeline for Human Pose Data Augmentation”
  + Published ([link](http://openaccess.thecvf.com/content/CVPR2021W/AMFG/html/Vyas_An_Efficient_3D_Synthetic_Model_Generation_Pipeline_for_Human_Pose_CVPRW_2021_paper.html))
* **Conference: IEEE International Conference on Bioinformatics and** **Biomedicine,** (Dec 2020)

**Seoul, South Korea**

* + “Additional Value of Augmenting Current Subscales in Braden Scale with Advanced Machine Learning Technique for Pressure Injury Risk Assessment”
  + Collaboration: Philips
  + Published ([link](https://ieeexplore.ieee.org/abstract/document/9313401/))
* **Conference Workshop: IEEE Machine Learning in Signal Processing, Pittsburgh 2019** (Dec 2019)
  + “[Recognition Of Atypical Behavior In Autism Diagnosis From Video Using Pose Estimation Over Time](https://ieeexplore.ieee.org/abstract/document/8918863/)”
  + Collaboration: Behavior Imaging (Idaho)
  + Published ([link](https://ieeexplore.ieee.org/abstract/document/8918863/))
* More publications can be viewed here: [Google Scholar](https://scholar.google.com/citations?user=LAIZZWEAAAAJ&hl=en&oi=ao) (Kathan Vyas) and [linkedin](https://www.linkedin.com/in/kathanvyas/)

Professional Experience

* **Clinical Research Intern,** ProUnlimited (Edwards Life Sciences) May 2022-Aug 2022
  + Working as a clinical research intern, focused on developing deep learning models and perform signal processing Heart Murmur Detection Using Ensemble of Deep Learning Classifiers for Phonocardiograms Recorded from Multiple Auscultation Locations.
* **Clinical Programing Researcher,** ProUnlimited (Edwards Life Sciences) May 2021-Aug 2021
  + Developing machine learning models and automation pipelines for pacemaker prediction & analysis of cardiac value events within clinical testing, patient monitoring.
* **Artificial Intelligence Researcher intern,** Philips (Research-North America) Feb 2020-June 2020
  + Developing IOT based artificial intelligence pipeline for automatic anomaly detection among daily usage utilities in a veteran’s home using wireless sensor and Raspberry PI. Also worked on COVID19 detection using IR image analysis of face.
* **3D Pose Researcher (Graduate Apprenticeship),** Biogen June 2019 –Dec 2019
  + Working with Multiple Intel Real Sense cameras, using various registration techniques, figuring out the best combination and number of angles to get a 3D pose. Finding an optimal algorithm that meets better quality and lowest budget used.
* **2D Pose and Behavior Researcher (Graduate Apprenticeship),** Behavior Imaging Jan 2019 –May 2019
  + Working with videos collected in home settings and building a detection pipeline for identifying stereotypical autistic behavior among kids. The pipeline implemented an improved kids pose estimation including a temporal element along with nonlinear interpolation with help of particle filter.
* **Graduate Clinical Researcher,** Philips (Research-North America) Aug 2018 –Jan 2019
  + Working with MIMIC3 Database, the main work was to develop an Actionable Semi-Automatic Machine learning algorithm that predicts the risk of developing Pressure based injuries on patients admitted in Intensive Care Units. The data analysis process also includes working with cameras and sensors which track patient’s movement in Sleep.
* **Deep Learning Intern,** Biomedical D.A. (Schwozny, Inc) & Behavior Imagining Jan 2018 –May 2018
  + As a part of the winter internship at BDA, Responsibilities include the development and implementation of a deep learning classifier to identify behavior mannerisms associated with autistic patients. Generating Python code to allow for the classification and test the code on a large body of day recorded for these patients.
* **Cloud Infrastructure Data Analytics Intern,** Autodesk July 2017-September 2017
  + As a part of a summer internship at Autodesk, got a fantastic opportunity to work with an amazing team working over cloud infrastructure and analyzing incoming logs dealing with infrastructure parts like AWS, Citrix Cloud, VDIs and Active Directory. Building dashboards in Kibana, setting up machine learning models and trying to detect any frauds if arise.
* **Co-Founder & Software/Web Developer,** Pixel PerfectionApril 2014-Sept 2016
  + Co-founded a startup during undergraduate days to develop efficient and cheap ERP solution for medium and small-scale industry. Started off as a final year project, the startup focused on providing an alternative to SAP ERP for companies that could not afford it. Received numerous government awards and scholarships. The startup was dismissed after all cofounders decided to pursue further studies in respective fields.

Academic Projects:

* **Hybrid Branch Predictor:** As a part of Computer Architecture course at graduate level, developed a branch predictor that used a perceptron as a hybrid selection mechanism at machine level code that achieved a parity to accepted benchmarks.
* **Capstone**: As a part of final term capstone in Master’s, working on a deep learning algorithm that classifies RGB videos based on an Autism characteristic as seen from video.
* **Kaggle**: Two individual projects had been undertaken, one precisely mask “Cancerous Lesions” on scanned Lung images (DICOM) and the other deals with image segmentation for Autonomous car driving project that segments vehicles and masks the type.
* **Intelligent Resource Planning Project**: In a group of 3, developed a custom-made ERP system, as a part of undergraduate project work. Acquired data from big companies and analyzed **it** to find an optimum set of modules required for any company as a basic ERP system.
* **MARS**: Developed a software for a company which Extracted data from their website and built an analysis report on statistics of users visiting the website.
* **SCRATCH**: As a part of curriculum for Data visualization course in Master’s, we were asked to analyze the data provided by Scratch (an online gaming community at MIT (Massachusetts Institute of Technology)) and based on that we were asked to author a white paper providing the findings and analysis.

Teaching Assistance / Graduate Research Assistance

* Data Science (DS): Foundation of Data Science
* Data Science (DS): Introduction to Data Management
* Electrical and Comp Eng (EECE): Noise and Stochastic Processes
* Electrical and Comp Eng (EECE): Computational Methods for Data Analytics
* Electrical and Comp Eng (EECE): Signal and Systems (Biomedical Applications)
* Computer Science: Introduction to Systems
* Computer Science: Programming

Technical Skills

* Data Science: **Classification, segmentation, Pattern Recognition, Supervised-Unsupervised Learning, Predictive & Descriptive Analysis, Data Visualization, Data Retrieval,** Working on Tableau
* **Clinical Data Collection**: Prepared protocols for data collection to be done at Hospital setting that consisted of three different sensors collecting 10 different modalities. Build dashboards for daily quality check and ackw to the nurse to making sure a proper process pipeline
* IOT: Raspberry PI, Home Assistant, Hass.io.
* Deep Learning Frameworks: **Keras, TensorFlow, Caffe, Theano, Pytorch, OpenCV**
* **Machine Learning and Computer Vision application, 3D Modeling -Rigging in Blender and Unity**.
* Certifications: Deep Learning and Computer Vision (Stanford University), Machine Learning and Data Analysis, Data Visualization with color pallets and Adobe Cloud, Analysis using Elastic Stack, Machine Learning in Elastic Stack, Big Data (Hadoop Developer), Big Data (Hadoop Admin), Analytics in R, Python and Data Analysis
* Workshops and Conferences: Hosted a Workshop for Deep Learning at “Metro Hacks 2018” for students. Also invited as a speaker to the first National Congress on Data Science and Big Data Analytics in Toronto (May 2018).
* Programming Languages: C, C++, Java, Python, HTML, JavaScript, Pearl, PHP, ASP .NET
* Frameworks/Software: Magento, WordPress, Elastic Stack, Anaconda, Jupyter Notebook, Canopy, Spyder
* Knowledge of Oracle, Microsoft Dynamics, Digital Marketing.