BADRINATH SINGHAL

(+91)8486508149 ◇ badrinath2602@gmail.com ◇ Personal Website

EDUCATION

- **Indian Institute of Technology (IIT) Guwahati** July 2014 - June 2018
  Bachelor of Technology CPI: 8.36/10
  Department of Electronics and Electrical Engineering
  Minor in Computer Science and Engineering

PUBLICATIONS

- U. Upadhyay, **B. Singhal** and M. Singh, *"Spinal Stenosis Detection in MRI using Modular Coordinate Convolutional Attention Networks,"* 2019 International Joint Conference on Neural Networks (IJCNN), Budapest, Hungary, 2019, pp. 1-8, doi: 10.1109/IJCNN.2019.8852085.
- S. A. Huddedar, M. Kagliwal, **B. Singhal** and F. C. Rhee, *"Performance Analysis of a Novel IT2 FCM Algorithm,"* 2018 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Rio de Janeiro, 2018, pp. 1-7, doi: 10.1109/FUZZ-IEEE.2018.8491457.

WORK EXPERIENCE

EmbodyMe - Machine Learning Scientist March 2020 - Present
Issay Yoshida, CEO EmbodyMe, Tokyo, Japan

- Working on 3D face reconstruction and expression and movement transfer in real time. Work involves literature search about similar work and innovating and implementing existing research.
- Prepared documentation of Xpression App for EmbodyMe.

Synapsica - AI Scientist Oct 2018 - August 2020
Meenakshi Singh, CEO Synapsica, Bangalore, India

- Developed Synapsica Spindle *(Product demo)* which is an AI reporting assistant for MRI Spine saving upto 80% of reporting time of radiologists.
- Used computer vision and deep learning techniques to identify vertebral levels measures patency of central canal and characterises of disc herniation and nerve root compression.
- Product is currently being used by radiology centers and going through clinical validation.

Student Mentor Oct 2019 - December 2020
Data Structures and Algorithms Nanodegree, Udacity

- Teaching, assisting and mentoring students globally for Udacity AI Nanodegree program.
- Weekly monitoring their performance in courses and assignments and providing feedback
- Providing guidance and motivation to students for completing the course.

Computer Vision and Fuzzy Systems Lab - Research Intern May 2017 - July 2017
Prof. Frank Chung-hun Rhee, Hanyang University, Seoul, South Korea

- Integrated *Multi-EIASC Algorithm* with *IT2 Fuzzy C-Means Clustering Algorithm* to give *Multi-IT2 Fuzzy C-Means Algorithm*.
- Instead of using the EIASC algorithm over each of the dimensions of pattern sets separately, we used Multi-EIASC algorithm for the complete pattern set which uses n-dimensionality of pattern sets as its fundamental property.
- Our work got published in **IEEE WCCI 2018 at Rio, Brazil**.

PROJECTS

- **Detection of Spinal Stenosis from axial MRI scans.**
  Synapsica
  - Developed a deep learning and computer vision based 2 stage architecture which measures spinal canal diameter in axial image of MRI scan.
  - Perform training and testing on 9,000 MRI axial scans and tweaked model to improve performance of the model
  - **Our work got published at IEEE IJCNN 2019.**
- **Efficient VLSI Implementation of SVD**
  Bachelor Thesis Project
  Prof. Shaikh Rafi Ahmed, Dept. of EEE, IIT Guwahati
  - Used CORDIC algorithm to calculate the SVD of $n \times n$ matrix ($n > 2$) using approach proposed to calculate SVD of 2×2 matrix using operations that can be implemented in VLSI architecture.
  - Involved reading papers, implementing and tested the approach on Verilog. Achieved reduction in processing time by 2% to calculate SVD.
- **Autonomous Intelligent Robot**
  Robotics Club, IIT Guwahati
  - Built a self-navigating bot which is able to map the environment, localize itself and reach the given goal position autonomously.
  - Displayed at technical exhibition conducted by Techniche 2015, IIT Guwahati.

KEY COURES TAKEN

- Advanced Topics and Probability and Random Process
- Biomedical Signal Processing
- Pattern Recognition and Machine Learning
- Introduction to Parallel Computing
- Linear Algebra
- Data Structures and Algorithms
- Probability and Random Processes
- Image Processing
- Digital Signal Processing
- Real Analysis
- Advanced Control Systems

TECHNICAL STRENGTHS

- **Programming Languages (Libraries):** C/C++, Python, OpenCV, Matlab, Git, Docker, LaTeX, Pytorch, ONNX, CoreML
- **Miscellaneous:** Intel 8085, Xilinx, PSCAD, Simulink, ROS

ACADEMIC ACHIEVEMENTS

- Joint Entrance Examination 2014: Secured position in top 1% among 150000 students.
- 5^{th} Rank in Guwahati region for AISSCE 2013.
- Offered Merit cum Means (McM) scholarship by IIT Guwahati for 3 consecutive years.
- 1^{st} in Algorithmic Trading competition during Kriti 2016, IIT Guwahati.
- 48^{th} state rank out of 80,000 students in JEE Mains 2014.