Shreyas Malakarjun Patil

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EDUCATION

Examination	University/Board	Institute	Year	CPI/Percentage
Graduate	GeorgiaTech	GeorgiaTech	2024 - Expected	–
Undergraduate	IIT Jodhpur	IIT Jodhpur	2019	9.24 / 10 (Rank - 1)
Intermediate/+2	CBSE	Infant Jesus Central School	2015	97 / 100
Matriculation	CBSE	VSSC Central School	2013	10 / 10

PUBLICATIONS

FS2Net : Fiber Structural Similarity Network (FS2Net) for Rotation Invariant Brain Tractography Segmentation using Stacked LSTM based Siamese Network
18th International Conference on Computer Analysis of Images and Patterns (CAIP) 2019
3 Sept 2019 - 5 Sept 2019 | Salerno, Italy

HFDSegNet: Holistic and Generalized Finger Dorsal ROI Segmentation Network
8th International Conference on Pattern Recognition Applications and Methods (ICPRAM) 2019
19 Feb 2019 – 21 Feb 2019 | Prague

A multi-task framework for skin lesion detection and segmentation
ISIC Skin Image Analysis Workshop, 21st International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018
15 Sept 2018 – 20 Sept 2018 | Granada, Spain

IPSegNet:Deep Convolutional Neural Network based Segmentation Framework for Iris and Pupil
13th International Conference on Signal Image Technology and Internet-Based Systems (SITIS) 2017
4 Dec 2017 – 7 Dec 2017 | MNIT Jaipur, India

UBSegNet: Unified Biometric ROI Segmentation Network
Asian Conference on Pattern Recognition (ACPR), 2017
26 Nov 2017 – 29 Nov 2017 | Nanjing, P. R. China

BrainSegNet : A Segmentation Network for Human Brain Fiber Tractography Data into Anatomically Meaningful Clusters
Deep Learning on Irregular Domains, British Machine Vision Conference (BMVC), 2017
4 Sept 2017 – 7 Sept 2017 | Imperial College London, UK

INTERNSHIPS AND EMPLOYMENTS

KapitalWise Inc.
Data Scientist | Dec 2018 - July 2019
Machine Learning for Financial Big Data Analytics

Pattern Recognition Lab | Friedrich–Alexander University, Erlangen–Nürnberg
Research Intern | Guide - Dr. Andreas K. Maier, Dr. Nishant Ravikumar and Sulaiman Vesal | May 2018 - July 2018
Learning Approahes for Medical Big Data Analytics

Multimedia Analytics Systems Lab | Indian Institute of Technology, Mandi
Research Intern | Guide - Dr. Aditya Nigam | May 2017 - July 2017
Deep Learning Applications in Biometric Recognition Systems and Medical Image Analysis

Crash and Safety Department | Mahindra Research Valley, Chennai
Research Intern | Guide - Kumarswamy Udugu | May 2016 - July 2016
Path Planning and Learning Applications in Autonomous Electronic Braking

PROJECTS

BIOMETRICS

Non-Ideal Iris Segmentation using Detection Networks

May 2017 – July 2017 | Guide - Dr. Aditya Nigam | IIT Mandi

- A deep network inspired from Faster RCNN was developed in Keras, which localized non-ideal iris assumed to be elliptical.
- A new CNN based Region Proposal Network (RPN) was designed and implemented to predict ellipse shaped regions.
- RPN predicted 5 parameters corresponding to a general ellipse and also the probability of the region containing an object.

Unified ROI Segmentation Network for Multi-Modal Bioemtrics

May 2017 – July 2017 | Guide - Dr. Aditya Nigam | IIT Mandi

- An end-to-end architecture for extracting region of interest from five biometric traits was designed in keras.
- The architecture consisted of two models merged: (i) Trait classification and (ii) Trait localization and was input size invariant.
- The model was trained and evaluated over various huge publicly available biometric databases.

An End-To-End HFDSegNet : Holistic And Generalised Ginger Dorsal ROI-Segmentation Network

May 2017 – July 2017 | Guide - Dr. Aditya Nigam | IIT Mandi

- A new end-to-end transformation and ROI extraction network was formulated combining ResNet50 and Faster RCNN.
- The first holistic deep learning architecture utilized to classify and localize the ROI of any type of fingerknuckle image.
- The entire network was trained with only 500 images per dataset, generally any deep network takes huge data to train on.

Human Gait Based Recognition System Using 3D Convolutional Layers and LSTMs

May 2017 – July 2017 | Guide - Dr. Aditya Nigam | IIT Mandi

- A hierarchal classification approach using C3-D and combination of C3-D and LSTMs for person identification is proposed.
- The network is made completely invariant of the size of the video data provided fortesting ortraining.
- An itertive combination based training of LSTMs is developed which learns the sequential information in the clips.

BIO-MEDICAL

Segmentation of the left Atrial Cavity from 3D Gadolinium-Enhanced MRI Data

August, 2018 - Present | Guide - Dr. Anil Kumar Tiwari | IIT Jodhpur

- We propose a 3D architecture for the localization of the 3D data to produce tightly fit 3D volumetric samples.
- A modified version of the Faster RCNN based architecture is developed for the localization and producing cubic samples.
- The cubes are then fed to a 3D U-Net + Hourglass network for generating 3D masks

Skin Lesion analysis for Melanoma Detection

May, 2018 - July, 2018 | Guide - Dr. Andreas Maier | FAU Erlangen-Nuremberg

- We proposed a multi-task convolutional neural network (CNN) based, joint detection and segmentation frame- work.
- A Faster R-CNN consisting a region proposal network (RPN), is used to generate region proposals, for lesion localization.
- The refined bounding boxes are finally cropped and segmented using 'SkinNet', a modified version of U-Net.

Fiber Structural Similarity Network for Unregistered Brain Tractography Data Segmentation

Aug, 2017 - Dec, 2017 | Guide - Dr. Aditya Nigam, Dr. Chiranjoy Chttopadhyay | IIT, Mandi and IIT, Jodhpur

- A deep network built with LSTMs and bi-directional LSTM in a Siamese architecture, for classification of DTI fiber tracts.
- In addition to registered brain data, we also demonstrated the effectiveness of the approach even in relative rotations.
- The proposed architecture is efficient using only 11,000 fiber pairs for training to get state-of-the-art results.

Brain Tractography Data Segmentation using Bilateral LSTMs

May 2017 – July 2017 | Guide - Dr. Aditya Nigam | IIT Mandi

- A stacked bidirectional LSTM based segmentation network was developed for classifying brain fiber tractography data.
- A two level hierarchical classification a) White vs Grey matter (Macro) and b) White matter clusters (Micro) was performed.
- BrainSegNet was developed in Keras and trained over three brain tractography data having over 250,000 fibers each.

GENERAL

Blind Signal Modulation Scheme Classification using Symmetrized Dot Patterns and CNNs

Jan, 2018 - April, 2018 | Guide - Dr. Sandeep Kumar Yadav | IIT Jodhpur

- The modulation schemes considered for the classification were 2-ASK, 4-ASK, 8-ASK, 4-PSK, 8-PSK, 8-QAM, 16-QAM.
- We propose a two step process for classification, first plotting the SD patterns and feeding it to the classification network. .
- The classification was performed in an hierarchical manner using ResNet50 at each level.

Edge Detection using Anisotropic Diffusion and Dynamic Stochastic Resonance

Jan 2017 – April 2017 | Guide - Dr. Rajlaxmi Chouhan | IIT Jodhpur , India

- Developed new methods for edge detection using Anisotropic Diffusion and Dynamic Stochastic Resonance.
- The method was formulated and the algorithm was implemented in MATLAB.
- Responsible for all the background research and played a vital role in ideation and implementation of the new technique.

Predictions for Autonomous Electronic Braking by Regression

May 2016 – July 2016 | Mahindra Research Valley | Chennai, India

- Worked on the ongoing project of Autonomous Electronic Braking in the Active Safety Departemnt.
- Prediction algorithms were developed for collision, degree of braking and steering angle in MATLAB.
- Generated algorithms for Path Planning in accordance with the vehicle dynamics and the terrain conditions.

SKILLS

Deep Learning Tools	ML and Image Processing Tools	Programming
• Keras	• OpenCv	• C++
• Tensorflow	• MATLAB	• C
• PyTorch		• Python
• Caffe		

COURSEWORK

Electrical and Data Sciences	Mathematics	Additional Online Courses
• Machine Learning	• Stochastic Calculus	• Machine Learning
• Pattern Recognition	• Probability Statistics and Random Processes	• Deep Learning for Computer Vision
• Information Theory and Coding	• Linear Algebra and Calculus	• Digital Image and Video Processing
• Digital Signal Processing	• Complex Analysis and Differential Equations	

AWARDS AND ACHIEVEMENTS

- Reviewer for the 22nd International Conference on Medical Image Computing and Computer Aided Interventions, Senzhen
- Awarded with the DAAD - Working Internships in Science and Technology Scholarship to pursue research in Germany
- Delegate, Indian Youth Delegation to Russian Federation
- 3rd in Idea and prototype presentation, Medical Technology Workshop , AIIMS
- Academic Distinction Award, Electrical Engineering , IIT Jodhpur, 2015-16, 2016-17 and 2017-18
- Achieved a perfect GPA of 10 consecutively in 2 semesters in second year of undergraduate studies.

POSITION OF RESPONSIBILITIES

Overall Student Head, Entrepreneurship Cell

May 2017 - May 2018 | IIT Jodhpur

Leading, managing and promoting the entrepreneurial activities in the institute, including lectures on finance, stock markets and several internal discussions

Assistant Director, Annual Theatre IIT Jodhpur, 2018

18th November 2018 | IIT Jodhpur

Headed the Acting Department for the Annual Theatre "Jab Sheher Hamara Sota He" IIT Jodhpur.

Corporate and Startup Relations Head, Entrepreneurship Cell, IIT Jodhpur

May 2016 - May 2017 | IIT Jodhpur

Maintaining the existing relations and forming new ones with several startups, mentors, speakers and investors and being the bridge between E-Cell and the corporate world.

Student Guide, Counseling Service, IIT Jodhpur

May 2016 - May 2017 | IIT Jodhpur

Counseling Service is a student run body to help the freshers to adjust to the exciting and challenging college life. As a student guide I had the responsibility to personally guide 10 freshers and give them support in their personal, professional and academic.