

Skand Vishwanath Peri

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| EDUCATION | B.Tech in Computer Science and Engineering, Indian Institute of Technology, Ropar, India | 2014 - 2018 |
| UNDERGRAD THESIS | Cross Modal Caricature Recognition and Verification <i>Mentored by Dr C.K.Narayanan, Dept. of CS, IIT Ropar</i> <i>Accepted in ACM MultiMedia, 2018</i> <ul style="list-style-type: none">Proposed a cross-modal, generic end to end network that exploits the shared and the unique features of visual and caricature faces for the verification and classification task.Collected a dataset of 205 celebs with visual and caricatures of them for the problem. | Aug, 2017 - Feb, 2018 |
| INTERNSHIPS | Google Summer of Code - DeepChem (Open Chemistry Organization) <i>Mentored by Bharath Ramsundar & Karl Leswing</i> <ul style="list-style-type: none">Working on incorporating U-Net architecture into DeepChem library.Working on adding data transformations suitable for medical images as a part of the library.Porting ResNet to DeepChem and shipping a pretrained model for further use by the users of DeepChem. HDR Deghosting <i>Mentored by Dr R.Venkatesh Babu, Dept. of Computational and Data Sciences, IISc Bangalore, India</i> <i>Work under submission in ECCV, 2018</i> <ul style="list-style-type: none">Trained a deep neural network model for generating HDR images from LDR images.Also a deep model was proposed for the registration of images in varying illumination. Mathematical Visual Simulators, <i>Mentored by Dr C.K.Narayanan, Dept. of CS, IIT Ropar</i> Developed a GUI version of Singular Value Decomposition, Gradient Descent and Lagrange Multipliers depicting their geometrical interpretation. Chart.js, Plotly.js, Numeric.js and Algebra.js libraries were used to develop the tool. | Summer, 2018 <i>Ongoing</i> Summer, 2017 Summer, 2016 |
| PUBLICATIONS | <ol style="list-style-type: none">MRI to FDG-PET: Cross-Modal Synthesis Using 3D U-Net For Multi-Modal Alzheimer's Classification Apoorva Sikka*, Skand Vishwanath Peri*, Deepti.R.Batula <i>MICCAI Workshop on Simulation and Synthesis in Medical Imaging</i> (to appear)Deep Cross Modal learning for Caricature Verification and Identification (CaVINet) Jatin Garg*, Skand Vishwanath Peri*, Himanshu Tolani*, Narayanan.C.Krishnan <i>ACM Multimedia (MM), 2018</i> (to appear)DisguiseNet : A Contrastive Approach for Disguised Face Verification in the Wild Skand Vishwanath Peri and Abhinav Dhall <i>IEEE Computer Vision and Pattern Recognition (CVPR) Workshop on Disguised Faces in the Wild</i>, 2018 <p>* - Equal Contribution</p> | |
| PROJECTS | MRI to FDG-PET: Cross-Modal Synthesis Using 3D U-Net For Multi-Modal Alzheimer's Classification <i>Mentored by Dr Deepti.R.Bhatula, Dept. of Computer Science, IIT Ropar</i> Proposed a cross-modal approach to estimate FDG-PET scans for the given MR scans using a 3D U-Net architecture. The use of the complete MR image instead of a local patch based approach helps in capturing non-local and non-linear correlations between MRI and PET modalities. The efficacy of the proposed method is evaluated in the context of Alzheimer's disease classification. | Aug, 2017 - April, 2017 |

Alzhemizer's Classification using MRI and PET images

Aug - Dec, 2017

Mentored by Dr Deepti.R.Bhatula, Dept. of Computer Science, IIT Ropar

In this work a localised deep neural net based architecture with 3D Convolution to predict if the has Alzhemizer's Disease using PET/MRI scans of the person's brain was proposed. Also a joint architecture (MRI + PET) was proposed in order to perform cross-model classification.

Personality Assessment from Videos *Under Submission*

Aug - Dec, 2017

Mentored by Dr Abhinav Dhall, Dept. of Computer Science, IIT Ropar

The main aim of this project was to assess the Big 5 personality traits from videos. We came up with a novel approach in which we could regress the 5 traits using the background as well as the facial features.

Detecting Distracted Vehicle Drivers

December, 2016 - January, 2017

Mentored by Dr C.K.Narayanan, Dept. of Computer Science, IIT Ropar

This project aims to predict if the driver is distracted while driving the vehicle. This project prominently uses Computer Vision and Convolution Neural Networks. Keras with tensorflow as backend has been used to run the model

Android Application for RNA Logistics, Noida, India

June, 2016 - July, 2016

Built an android application for real time tracking of trucks. Developed the driver end application and used Google Maps API for navigation and worked with JSON to recieve requests from server end.

Database Storage of data received from Sensors

Dec, 2015

Mentored by Dr C.K.Narayanan, Dept. of CS, IIT Ropar

This project aims to receive Data from sensors via Socket Programming and store it in MySQL Database which is further used as a training dataset for machine learning algorithm. This was implemented with the help of Queue data structure and Java Database Connectivity (JDBC) and no loss in data was ensured.

TECHNICAL SKILLS

Research Interests - Heterogenous Face Recognition, Cross Modal generative models, Computational Photography, BioMedical Imaging, Machine Learning, Deep Learning,

Languages - C, Python, Java, C++, PHP, MATLAB.

Tools/Frameworks - Pytorch, Keras, Lasagne, Theano, MySQL, SQLite, OpenGL, OpenCV, Android.

OTHER PROJECTS

1. Auto detection challenge

November, 2017

The aim of this task was to detect auto-rickshaws in images and give the bounding box as the output. A simple MLP with 4 layers was trained on HOG features of patches extracted from positive and negative class.

2. CT Reconstruction Algorithms - ART, SART, Back Projection and Filtered Back Projection

October, 2017

In this work, I have implemented different Computed Tomography (CT) reconstruction algorithms. Majorly CT reconstructions involve 2 methods, Algebraic Reconstruction Algorithms and Back Projection Algorithms. I have implemented 2 variants of the first one [ART and SART] and 3 variants of the second one [simple BP and Filtered BP, Noise Filtered BP].

3. Nonlocal Means-Based Speckle Filtering for Ultrasound Images

September, 2017

In this project I implemented non local means based noise filtering for ultrasound images. This algorithm is specific to ultrasound speckle noise. The paper proposed a new similarity metric : Pearson Distance.

4. Visual Bag of Words & Homography Estimation

September, 2017

Visual bag of words on the Fashion MNIST data set was implemented using k-means clustering. Also Mo-saic was created using homography estimation(projective transformation), warping and then blending of the images. The technical report of this can be found [here](#).

5. **Creating Collage using Hybrid Images**

August, 2017

Used the concept of [Hybrid Images](#) to create a collage of various images. The technical report of this can be found [here](#).

5. **Door Lock System using Zigbee Protocol**

March, 2017

Used the Zigbee protocol and Arduino in order to make a door locking system. This project was a part of the Computer Networks course.

6. **Image Morphing**

Nov, 2016

We morphed 2 images by using Delaunay Triangulation technique. We take the tie points as input from the user and then compute the affine transformation from one image to the other and then blend the two images to get a smooth transition from one image to the other. This process can be performed with multiple images (we have performed it with 2 and 3 images).

7. **Finding Quality of Life Index**

Feb, 2016

Used Fuzzy Relation Database in order to find the Quality of life index of a city. Various factors that would affect the life index were found and an algorithm in order to consider the fuzziness involved in the factors and compute the index was developed.

SCORES,
ACHIEVE-
MENTS,
SCHOLARSHIPS

1. Ranked 2nd in a class of 120 in Spring Semester of 2017-2018 academic year.
2. Head of Coding Club, IIT Ropar for the academic year 2016-2017.
3. City Head of [BloodConnect](#) (NGO) from 2015 to 2016 January.
4. Member of Team [Kshitij](#) (Annual Magazine of IIT Ropar) from 2014 to 2015 June.
5. Secured AIR 2084 in IIT JEE 2014 (among the top 0.5% students).
6. Selected for prestigious [Kishore Vaigyanik Protsahan Yojana](#) Fellowship (among top 2% of the students).
7. Intermediate/+2 (Board of Intermediate Education, Andhra Pradesh): 96.7 percent.
8. Matriculation (All India Secondary School Examination): CGPA 10/10.