

# Shreshth Saini

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## EDUCATION

Examination	University/Board	Institute	Year	CPI/Percentage
Undergraduate	IIT Jodhpur	IIT Jodhpur	2020	8.05 / 10
Intermediate/+2	Rajasthan Board of Secondary Education	M.B. Public School	2015	89.80 / 100
Matriculation	Rajasthan Board of Secondary Education	Modern Defence School	2013	91.33 / 100

## PUBLICATION

### PIXISEGNET: PIXEL LEVEL IRIS SEGMENTATION NETWORK USING CONVOLUTIONAL ENCODER-DECODER WITH STACKED HOURGLASS BOTTLENECK

IET Biometrics, DOI: 10.1049/iet-bmt.2019.0025

### DETECTOR-SEGMENTOR NETWORK FOR SKIN LESION LOCALIZATION AND SEGMENTATION

7th National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics(NCVPRIPG 2019)

## INTERSHIPS

### SAW SWEE HOCK SCHOOL OF PUBLIC HEALTH (SSHPH) | NUS

May 2019 – July 2019 | Guide - Dr. Mornin Feng

#### Skin Cancer Analysis\* | Paper Under Review

- Proposed a new branched segmentation network for challenging skin lesion identification and segmentation task
- Branches emerging from main encoder served different purpose like localizing the lesion, focusing on lesion boundaries
- Achieved state of the art results on ISIC and PH2 datasets

### MANAS LAB | IIT MANDI

May 2018 – July 2018 | Guide - Dr. Aditya Nigam

#### Iris segmentation

- Proposed a new segmentation network for challenging case of non ideal iris whilst capturing the image
- Network consisted of Convolutional Neural Network based Encoder-Decoder with stacked Hourglass bottleneck
- Achieved state of the art results (jaccard index of 0.92) on publicly available datasets of iris

#### No Reference Biometric Image Quality Assessment

- Proposed an end-to-end CNN based architecture for hand based biometric image quality assessment
- Architecture mainly consisted of two parts:(i) Image-Re-constructor and (ii) The Quality Score Regressor
- The proposed Network outperformed the existing methods(Classical Image Processing and Deep Learning)

## PROJECTS

### SKIN LESION ANALYSIS FOR MELANOMA DETECTION

Jan 2019 - May 2019 | Guide - Dr. Anil Kumar Tiwari | IIT Jodhpur

- Proposed a state of the art segmentation network to classify lesion pixel in dermoscopic images
- Architecture first localized the possible skin lesion and then localized regions were fed to the segmentation network
- Segmentation network was pretrained on the cropped dataset prepared from the original masks

### RETINAL VESSEL SEGMENTATION

Sep 2019 - Dec 2019 | Guide - Dr. Anil Kumar Tiwari | IIT Jodhpur

- Proposed a novel segmentation network to segment the blood vessels in fundus images.
- Architecture incorporates the octave convolution and attention modules.
- Segmentation network was trained on DRIVE dataset and was tested STARE and HRF along with STARE.

## **SEGMENTATION OF THE LEFT ATRIAL CAVITY FROM 3D GADOLINIUM-ENHANCED MRI DATA**

Aug 2018 - Dec 2018 | Guide - Dr. Anil Kumar Tiwari | IIT Jodhpur

- Proposed a 3D Convolutional Neural Network to localize cavity in MRI data to produce tightly fit 3D volumetric samples
- Modified version of the Faster RCNN based architecture was developed for the localization and producing cubic samples
- The cubes were then fed to a 3D UNet + Hourglass network for generating 3D masks

## **EDGE-PRESERVING IMAGE DENOISING TECHNIQUES**

Jan 2018 - April 2018 | Guide - Dr. Rajlaxmi Chouhan | IIT Jodhpur , India

- A rigorous study of edge preserving image de-noising techniques was performed
- Several denoising techniques were implemented from scratch in MATLAB
- A comparative study showed that with high computation cost Non-Local-Means(NLM) gives the best results

## SKILLS

Deep Learning Tools	ML and Image Processing Tools	Programming
<ul style="list-style-type: none"><li>• Keras</li><li>• Tensorflow</li><li>• Scikit-Learn</li></ul>	<ul style="list-style-type: none"><li>• OpenCv</li><li>• MATLAB</li></ul>	<ul style="list-style-type: none"><li>• Python</li><li>• C++</li></ul>

## COURSEWORK

Electrical and Data Sciences	Mathematics	Additional Online Courses
<ul style="list-style-type: none"><li>• Machine Learning</li><li>• Artificial Intelligence</li><li>• Introduction to Data Science</li><li>• Information Theory and Coding</li></ul>	<ul style="list-style-type: none"><li>• Probability Statistics and Random Processes</li><li>• Linear Algebra and Calculus</li><li>• Complex Analysis and Differential Equations</li></ul>	<ul style="list-style-type: none"><li>• Machine Learning</li><li>• Deep Learning for Computer Vision</li><li>• Digital Image and Video Processing</li></ul>

## AWARDS AND ACHIEVEMENTS

- First position in NUS-MIT datathon-2019 in medical imaging track
- Ranked in National Top 1(percent)(amongst 1,300,000 candidates) in JEE Mains 2016 and Top 5(percent)(amongst 200,000 candidates) in IIT-JEE Advanced 2016
- Letter of Appreciation from District Collector (Sirohi) for Academic Excellence | 2013
- State Rank 39th out of 0.8 million in Secondary exams | 2013

## POSITION OF RESPONSIBILITIES

### **STUDENT LEADER, LAMBDA**

Aug 2018 - Present | IIT Jodhpur

- Formed and leading the undergraduate search group of 20+ students "Learning Approaches For Medical Big Data(LAMBDA)"

### **OVERALL STUDENT HEAD, ENTREPRENEURSHIP CELL**

May 2018 - May 2019 | IIT Jodhpur

- Lead, Managed and Promoted entrepreneurial activities in and around the institute
- Organised IdeaSpark which witnessed the participation from across the state and National personalities as guests

### **ASSISTANT HEAD, COUNSELLING SERVICES**

May 2018 - May 2019 | IIT Jodhpur

- Organized events and workshops for maintaining positive atmosphere in college and mentored student guides

### **VOLUNTEER, INTERNATIONAL WORKSHOP ON DEEP LEARNING(IWDL) (IIT MANDI)**

May 2018 | IIT Mandi

- Prepared the study material and took hands-on session for participants

### **STUDENT GUIDE, COUNSELLING SERVICES**

May 2017 - May 2018 | IIT Jodhpur

- I had the responsibility to guide 10 freshers in their personal, professional and academic life