

# ABHINAV SAGAR

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## EDUCATION

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**Vellore Institute of Technology, Vellore**  
BTech

*July 2016 - Present*

## EXPERIENCE

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**Vellore Institute of Technology, Vellore**  
*Research Assistant*

*July 2018 - Present*

- Advised by Prof. RajKumar Soundrapandian and Dr. Dheeba Jacob.

**Vellore Institute of Technology, Vellore**  
*Teaching Assistant*

*Dec 2019 - Present*

- TA for UG level course CSE4020 (Machine Learning) with Professor Gayathri P.

**Tessact, Mumbai**  
*Computer Vision Intern*

*May 2019 - Jun 2019*

- Designed a machine learning model from scratch for product recommendation using variational autoencoder.
- The algorithm scored a mean average precision value of 0.86 which on deployment led to 23 percent increase in sales for the company.

**Tata Steel, Jamshedpur**  
*Deep Learning Intern*

*Jun 2018 - Jul 2018*

- Trained a neural network on power grid electricity consumption data to predict the load 24 hours ahead of the actual generation.
- My work was later refined and deployed by current engineers. It is currently being used and has boosted upto 20 percent energy in the plant.

## PROJECTS

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### Bayesian Neural Network using Variational Autoencoder

- Designed a neural network to take into account uncertainty while generating fashion images using variational inference and local reparameterization trick.

### Instance Segmentation for Nuclei Detection

- Made a U-Net neural network for automatic segmentation of nucleus in microscopic images. The segmentation IOU value achieved was 0.416.

### Predicting Airbnb Prices

- Answered business questions so that both hosts and guests can plan well in advance. Also made a Light GBM model to predict house prices. The model achieved R-Squared value of 0.632.

### Deep Deterministic Policy Gradients for Bipedal Walker

- Made an agent to run which had no knowledge beforehand by interacting with the environment using actor critic model, prioritized experience replay and custom reward design.

### **Automatic Segmentation of Ships in Satellite Images**

- Used a custom Mask R CNN algorithm to automatically identify whether a remotely sensed target is a ship or not. The algorithm obtained mean average precision value of 0.61.

### **Cryptocurrency Price Prediction in Real Time**

- Made an algorithm for predicting cryptocurrency price using LSTM neural networks. The MAE of the model obtained was 0.028.

### **VAE GAN to Create Facial Images**

- Created fake images of people using variational autoencoder generative adversarial network using custom loss function and sampling from gaussian distribution.

### **ICC 2019 Cricket World Cup Prediction**

- Devised a random forest model to predict the winner of 2019 cricket world cup by scraping data from Crickbuzz website. The accuracy of the model obtained was 70 percent.

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## **PUBLICATIONS**

**Abhinav Sagar**, Serge Belongie, James Davis et al

On Optimizing Human-Machine Task Assignments

AAAI Conference on Human Computation and Crowdsourcing (HCOMP), San Diego, CA, 2015

**Abhinav Sagar**, Rajkumar Soundrapandian

Semantic Segmentation for Self Driving Cars Using Dilated Transposed Fully Convolutional Neural Network

Submitted for review - Journal of Visual Communication and Image Representation (Springer)

**Abhinav Sagar**, Dheeba Jacob

Computer Aided Diagnostic Support System for Skin Cancer using Convolutional Neural Networks

Submitted for review - European Conference on Computer Vision 2020

**Abhinav Sagar**

A New Activation Function for Training Deep Neural Networks to Avoid Local Minimum

6th Workshop on Semantic Deep Learning - ICJAI

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## **TECHNICAL STRENGTHS**

### **Programming Languages**

Python, Java, C++, Javascript

### **Libraries**

Tensorflow, Scikit Learn, Keras, Pytorch, Numpy, OpenCV, Spark

### **Frameworks**

React, Flask, Express

### **Databases**

MySQL, MongoDB

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## **ACHIEVEMENTS**

- Attended the Nordic Probabilistic AI School at Trondheim, Norway with full travel grant.
- Ranked in the Top 30 Contestants for Flipkart Machine Learning Challenge held in Bengaluru, India.
- Participated actively in competitive programming on Spoj. My world rank currently is 3894.
- Awarded the VITEEE Scholarship for full 4 years.

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## **RELEVANT COURSES**

Data Structures and Algorithms, Object Oriented Programming, Statistics and Probability, Discrete Mathematics, Web Technologies, Java Programming, Python Programming, Multivariate Calculus, Graph Theory, Robotics, Operation Research, Open Source Programming, Numerical Methods

## **REFERENCES**

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**Professor Serge Belongie**

Dept. of Computer Science

Cornell University, Ithaca, New York

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**Professor Rajkumar Soundrapandian**

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