# Sanat B Singh

ML Researcher & Engineer


Bhubaneswar, Odisha
+918114342153
sanat.b.singh99@gmail.com
linkedin.com/in/sanatbsingh/
github.com/sanatsingh


## Summary


I am passionate and motivated about technology across different domains. My research interests are interdisciplinary comprising of Deep Learning, Computer Vision, Biomedical Imaging, AI for Social Good and Software Development. Always open to learning something new.


## Education

**Computer Vision Nanodegree** 2020 - 2020

Udacity

Graduated. Verify here

**Bachelor of Technology (Computer Science & Engineering)** 2017 - 2021

Kalinga Institute of Industrial Technology, Bhubaneswar

8.91 - (Till end of 7th Semester)

**Class XII - SSSC (Senior Secondary School Certificate)** 2016 - 2017

CBSE

83.6% in Class XII - CBSE Board - The Khaitan School, Noida

**Class X - SSC (Secondary School Certificate)** 2014 - 2015

CBSE

9.8 CGPA - CBSE Board - Khaitan Public School, Noida

## Experience

**Research Intern** July 2020 - Present

University of Houston Downtown

Working as a research intern under Dr. Hong Lin at the Department of Computer Science and Engineering Technology, University of Houston Downtown, USA.

**ML Engineer** 2019 - Present

Zyik.ML

- Founded Zyik.Ml along with my friend & colleague Aayush Kumar to provide affordable AI-based healthcare services.
- Took managerial decisions as one of the founding partners, and successfully led the team, which resulted in us getting selected for the AWS Activate program. Registered as a startup under the Ministry of Micro, Small and Medium Enterprises - Government of India.
- Developed Computer Vision-based CADx Systems and Proof of Concept projects/prototypes.

**Machine Learning Instructor (Core Team)** November 2018 - Present

Konnexions - KIIT

- Taught and mentored around 120 undergrad students in a semester long Machine Learning course.
- Designed course curriculum, prepared presentation, conducted hands-on sessions and workshops.

**Core Team Member - (ML Domain)** March 2019 - Jan 2020

DSC KIIT

- Member of DSC KIIT with Machine Learning as the domain. Developer Student Clubs is a flagship program by Google for aspiring student developers.
- Conducted workshops on Google Cloud and Basics of Machine Learning.

## Projects

### Medico - A Dashboard System

Johns Hopkins Center for Bioengineering Innovation & Design (CBID) - Covid19 Virtual Design Challenge

A dashboard system for doctors working in remote/assembled clinics where they can access status & detailed health-related information of different patients instantly and follow up with them (especially remote patients who are under quarantine at home) & a Covid19 X-Ray Screening application which will assist doctors in diagnosis. Also, a dedicated self-diagnosing section for COVID19 is present. Meant to act as a bridge between the patients quarantined at home and the doctors in hospitals.

Designed as an entry to Johns Hopkins Center for Bioengineering Innovation & Design (CBID) - Covid19 Virtual Design Challenge.(Detailed proposal available on request, currently only a Prototype)

Website: https://zyik-medico.herokuapp.com/

### CADx System for Chest X-Ray Diagnosis

Academic Project

Designed and developed a web application for interpretation/diagnosis of chest X-rays. Transfer Learning was applied, a pretrained DenseNet121 was used. Major issue tackled in the project was of Data Imbalance present in the dataset which solved by using Weighted Cross-Entropy Loss, weights were calculated based on class frequencies to ensure equal contribution to the loss by each class.

### ACL Tear Detection

Zyik.ML

A CADx system to detect ACL (Anti cruciate ligament) tear in MRI scans. A CNN classifier is built using Alexnet on the MRNet dataset released by Stanford ML group. Data augmentation was applied while training to deal with less number of data samples. The AUC achieved was 0.858 on the train set and 0.876 on the validation set.

Website: https://zyik.ml

(Project live on request)

### Computer Aided Diagnostic System for Malaria Detection

Zyik.ML

A lightweight Computer-Aided Diagnostic System with an aim of easing the weary task of detection of Malaria infected cells by examination of blood smears under a microscope using deep learning. A custom lightweight ConvNet is implemented with less than 8 million parameters that come close to Densenet121 in terms of parameters but shows 10x faster inference time with far fewer usage of resources on CPU deployment thus eligible for deployment on edge devices. Validation accuracy achieved was 95.6% (Updated Mish Version attained 97.8%).

GitHub Repository

Website: https://zyik.ml

## Publications

- MOSQUITO-NET: A Deep Learning based CADx system for malaria diagnosis along with model interpretation using GradCam and class activation maps - SCI @ Wiley Expert Systems - DOI : 10.1111/exsy.12695 (Status: In Production)
- Zyik.ML - A CADx System - Published as a book chapter in proceedings of Project Innovation Contest 2021 (ISBN available soon)
- Poster Presentation in ICML 2020 Machine Learning for Global Health Workshop

## Technical Skills

- **Languages:** Python, C, C++, Java
- **Machine Learning Frameworks:** PyTorch, Tensorflow, Scikit-Learn
- **Web Dev Tools :** Flask, Nginx, HTML, CSS
- **IDEs:** Visual Studio Code, Jupyter Lab, Spyder
- **Cloud & DNS Services:** AWS, Azure, GCP, Cloudflare, Freenom
- **Operating Systems:** Windows, Linux (Ubuntu, CentOS, Manjaro)

## Courses Undertaken

- Deep Learning Specialization (Coursera)
- Intro to Deep Learning with PyTorch (Udacity)
- Machine Learning (Coursera)

## Achievements

- Reviewer for Multimedia Systems, Springer Journal
- Selected as one of few teams from India for participating in Johns Hopkins Center for Bioengineering Innovation & Design (CBID) - Covid19 Virtual Design Challenge.

## Strengths and Interests

**Strengths:** Self Motivated, Flexible, Can adapt to a crucial situation, Determined, Teamwork Skills, Good Communication Skills, Always Learning

**Interests:** Reading, Keeping up with Technologies in General - Mobiles, PCs etc.