

# Soham Chitnis

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## Education

### BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

Goa, India

B.E(HONS.) IN COMPUTER SCIENCE WITH MINOR IN DATA SCIENCE

Oct. 2020 -Present

- **CGPA** - 8.6/10
- **Relevant Completed Coursework:** Computer Programming, Linear Algebra, Probability and Statistics, Calculus, Object-Oriented Programming, Data Structures and Algorithms
- **Relevant Ongoing Coursework:** Fundamentals of Data Science, Applied Statistical Methods
- **Teaching Assistant:** Computer Programming

### Thakur College of Science & Commerce

Mumbai, India

CLASS XII, MAHARASHTRA STATE BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION (MSBSHSE)

2019 - 2020

- **Percentage:** 90.77%

### Cambridge School

Mumbai, India

CLASS X, INDIAN CERTIFICATE OF SECONDARY EDUCATION (ICSE)

2017 - 2018

- **Percentage:** 96.42%

## Research Interests

Computer Vision, Reinforcement Learning, Graph Representation Learning, Cognitive Neuroscience

## Research Experience

### APP Center for AI Research, BITS Pilani

Goa, India

UNDERGRADUATE RESEARCHER

Feb. 2022 - Present

- **Project:** An interpretable deep-learning method for digital pathology image analysis
- **Supervisor:** Dr. Tanmay Verlekar, Dr. Tirtharaj Dash, Prof. Ashwin Srinivasan
- **Collaborators:** Dr. Sidong Liu, Macquarie University, Sydney
- Developing **data-efficient, adaptable, interpretable deep-learning methods** for glioma subtyping from Whole Slide Images in weakly supervised setting
- Previously worked on Molecule Generation using **Graph Autoencoders & Variational Graph Autoencoders**.

### Central Electronics Engineering Research Institute (CSIR-CEERI)

Chennai, India

RESEARCH INTERN | **CODE & REPORT**

May. 2022 - July. 2022

- **Project:** Hyperspectral Imaging for Plastic Segregation
- **Supervisor:** Dr. Madan Kumar Lakshmanan, Dr. Amalin Prince A.
- Conducted **pre-processing** of data and **benchmarking** models.
- Used Spectral Pre-processing methods: Smoothing & Standard Normal Variate
- Built a **data augmentation** module for **Hyperspectral Images**.
- Data Augmentation module is able to Random Cropping & Resizing, horizontal flip and colour jitter for Hyperspectral Images
- Implemented Deep CNNs for Hyperspectral Images
- Trained models using **Self-supervised learning** method: SimCLR

## Teaching Experience

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### Introduction to Deep Learning, Quark Controls BITS Pilani Goa

Online

INSTRUCTOR

July, 2022 - August 2022

- Taught an introductory course on Deep learning with focus on Computer Vision and mentored freshman students in the final project.

### Computer Programming, BITS Pilani

Goa, India

TEACHING ASSISTANT

May 2022 - August 2022

- Worked as Teaching Assistant for the course Computer Programming, which teaches C programming to freshman students
- Conducted doubt solving sessions, evaluated labs and assisted **Prof. Anup B Mathew & Prof. Arnab K Paul.**

### Mathematics-I (Multivariate Calculus), Academic Assistance Program CTE

Goa, India

MENTOR

Dec 2021 - May 2022

- Mentored freshman students for the course Mathematics-I and helped them in solving doubts and understanding the concepts

## Projects

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### Implementation of Super-Resolution ResNet(SRResNet) & Super-Resolution CNN(SRCNN)

March 2022

CODE & REPORT

- Implemented **Super-Resolution CNN & Super-Resolution ResNet** with an upsampling factor of 2
- Conducted experiments and study on interpolation modes: **Bi-cubic**, **Bi-linear** and **Nearest Neighbour** and upsampling methods: **Sub-pixel** and **Transpose Convolutions**.

### Comparative Study of Reward functions on Policy gradient

August 2021

CODE & REPORT

- Conducted a comparative study on different reward functions with **Policy gradient** algorithm to find minima of two variable quadratic function

### Robot for Autonomous Indoor Navigation

September - December 2021

CODE

- Deployed **Semantic Segmentation** model for Scene parsing on the robot Trotbot.
- Trained using MIT ADE20K Dataset

### Project Kratos

August 2021-Present

WEBSITE

- Developing Mars Rover for the University Rover Challenge (URC). At URC 2022, the team stood 1st in India, 2nd in Asia and 20th globally.
- Working on Rock analysis using Computer Vision. Building a End-to-end Deep Learning model for detecting presence of life in rocks.

### A review of "A ConvNet for 2020s"

March 2022

CODE & REPORT

- Reviewed the paper **A ConvNet for 2020s**
- Conducted a study over the activation functions used

### Bayesian Neural Network for Noisy XOR using Markov Chain Monte Carlo

March 2022

CODE

- Implemented Bayesian Neural Network using No-U-turn Sampler

### Adversarial Deep Learning

September - December 2021

CODE

- Worked as Contributor to this Project. This project is a part of a book being written of same name where this project involves tutorials for the book.

### MLDataset.jl

March 2022

CODE

- Worked as Contributor. Added PolBlogs Graph Datasets to Julia from Torch-geometric.

## Online Courses & Summer Schools

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2022	<b>CS 285: Deep Reinforcement Learning (Ongoing)</b> , UC Berkeley	<a href="#">Online</a>
2022	<b>AI Summer School</b> , CVIT, IIT Hyderabad	<a href="#">Online</a>
2022	<b>Deep Learning Specialization</b> , DeepLearning.AI	<a href="#">Online</a>
2022	<b>CS231n-Deep Learning for Computer Vision</b> , Stanford	<a href="#">Online</a>
2022	<b>Building Transformer-Based Natural Language Processing Applications</b> , NVIDIA Deep Learning Institute	<a href="#">Online</a>
2021	<b>Machine Learning</b> , Coursera	<a href="#">Online</a>
2021	<b>Fundamentals of Deep learning</b> , NVIDIA Deep Learning Institute	<a href="#">Online</a>

## Skills

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- **Languages:** Python, C/C++, Matlab
- **Frameworks:** PyTorch, Tensorflow, Keras
- **Tools:** GIT, Linux
- **Python Libraries:** Numpy, Scikit-Learn, OpenCV, Matplotlib, Pandas, Scipy

## Honors & Awards

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2022	<b>2<sup>nd</sup> Rank, Team Project Kratos</b> , Anatolian Rover Challenge(ARC)	<a href="#">Istanbul, Turkey</a>
2021	<b>Silver Prize</b> , CTE ML Hackathon	<a href="#">Goa, India</a>
2020	<b>100 percentile (Physics-Chemistry-Mathematics &amp; Mathematics)</b> , Maharashtra Common Entrance Test	<a href="#">Mumbai, India</a>
2017	<b>Silver Medal</b> , Dr. Homi Bhabha Young Scientist Competition	<a href="#">Mumbai, India</a>
2016	<b>5<sup>th</sup> Rank</b> , CV Raman Science Competition	<a href="#">Mumbai, India</a>

## Committees

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2022	<b>Member</b> , Society for Artificial Intelligence and Deep Learning	<a href="#">Goa, India</a>
2021	<b>Core Member</b> , Electronics and Robotics Club	<a href="#">Goa, India</a>
2021	<b>Core Member, Life Detection</b> , Project Kratos	<a href="#">Goa, India</a>