

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

Nov. 2020 - Present

- **CGPA** - 8.45/10
- **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

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

The Kwon Lab for Low Vision and Brain Research, Northeastern University

Boston, USA

RESEARCH ASSISTANT | [WEBSITE](#)

Oct. 2022 - Present

- **Supervisor:** Alish Dipani, Dr.MiYoung Kwon
- Understanding the statistical regularity for the **oblique effect** in Deep Neural Networks- CNNs & ViTs
- Creating benchmark datasets to understand the statistical regularities
- **Training** the state-of-the-art DNNs for understanding the effect of the regularity.

APP Center for AI Research, BITS Pilani

Goa, India

UNDERGRADUATE RESEARCHER | [WEBSITE](#)

Feb. 2022 - Present

- **Project:** Interpretable deep-learning methods for digital pathology image analysis
- **Supervisor:** Dr. Tanmay Verlekar, Dr. Tirtharaj Dash, Prof. Ashwin Srinivasan,
- **Collaborators:** Dr. Sidong Liu, Macquarie University, Sydney
- Proposed the use of **Domain-specific pre-trained** models for **multiple instance learning-based** cancer diagnosis models using Whole Slide Images which not only improves the accuracy but also, **confidence** of the models
- Previously worked on Molecule Generation using **Graph Autoencoders & Variational Graph Autoencoders**.

- **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**.
- Implemented Deep CNNs for Hyperspectral Images
- Trained models using **Self-supervised learning** method: SimCLR

Publications

1. **Chitnis, S.R.**, Liu, S., Dash, T., Verlekar, T.T., Di Ieva, A., Berkovsky, S., Vig, L. and Srinivasan, A., 2023. **Domain-Specific Pretraining Improves Confidence in Whole Slide Image Classification.** arXiv preprint arXiv:2302.09833. (Under Review)
Link: [Paper](#)

Teaching Experience

Introduction to Machine Learning and Deep learning, CTE BITS Pilani Goa

Goa, India

INSTRUCTOR

Nov. 2022 - Present

- Teaching an introductory course in Machine Learning & Deep Learning to freshman year students.

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

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

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

Skills

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

Honors & Awards

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

Committees

2022	Member , Society for Artificial Intelligence and Deep Learning	Goa, India
2021	Core Member , Electronics and Robotics Club	Goa, India
2021	Core Member, Life Detection , Project Kratos	Goa, India