

Rhitvik Sinha

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Coursework

* indicates provisional / ongoing coursework
(_) indicates grade received

New York University,
Graduate Level Coursework
09/2022 – present

CSCI-GA 1170: Fundamental Algorithms*, **CSCI-GA 2565:** Machine Learning*, **DS-GA 1014:** Optimization and Computational Linear Algebra*

IIT Kharagpur,
Graduate Level Coursework
01/2021 – 04/2022

AI60004: Big Data Processing (9/10), **AI61002:** Deep Learning (9/10), **CD66001:** Accelerated Data Science (10/10), **AI61005:** Artificial Intelligence (8/10), **CS61061:** Data Analytics (9/10), **CS66010:** Security & Privacy in Online Social Networks (8/10)

IIT Kharagpur,
Undergraduate Level Coursework
08/2018 – 04/2022

CS10001: Programming & Data Structures (8/10), **MA20101:** Transform Calculus (8/10), **MA20106:** Probability & Stochastic Processes (9/10), **CS31702:** Computer Architecture & Operating Systems (8/10), **AI42001:** Machine Learning (9/10)

Skill

Programming Languages
C, C++, C#, JavaScript, Python, R, MATLAB, Java, Scala

Python Data Science Frameworks
Tensorflow 2.x, PyTorch, Scikit-Learn, Numpy, Matplotlib, Pandas, OpenCV

Cloud Compute Tools
Amazon Web Services (AWS): S3, EC2, SageMaker

Education

Courant Institute of Mathematical Sciences, New York University, Master of Science

2022 – 2024 | New York City, USA

Major: Computer Science (Incoming, Fall '22)

Indian Institute of Technology, Kharagpur, Bachelor of Technology (Hons.)

2018 – 2022 | Kharagpur, India

Major: Electrical Engineering

Delhi Public School (DPS), RK Puram, High School

2016 – 2018 | New Delhi, India

English, Mathematics, Computer Science, Physics, Chemistry

Experience

Ministry of Electronics and Information Technology, Govt. of India,

Transformational AI Intern

08/2021 – 10/2021 | (Virtual) New Delhi, India

- Working on Transformational AI projects in the Health Sector, as part of Ministry of Electronics and Information Technology's **Digital India Internship Scheme** (2021).
- Responsible for the landscaping and the subsequent review of the ecosystem and policies operating at the intersection of AI and Healthcare in India.

Centre of Excellence in Artificial Intelligence, IIT Kharagpur

Bachelor's Thesis Project

08/2021 – 11/2021 | (Virtual) Kharagpur, India

Forecasting of Extreme-Causing Weather Patterns Using Deep Learning

Supervised by **Dr. Adway Mitra**, compare effectiveness and accuracies of Capsule Neural Networks compared to Convolutional Networks at the task of "Forecasting Extreme Weather Patterns".

Undergraduate Research Project

01/2021 – 04/2021 | (Virtual) Kharagpur, India

- Dataset Used: **NCAR CESM-LENS** (stored on AWS S3)
- Python**-based implementation, **PyTorch** used as Deep Learning framework of choice to implement "Dynamic Routing Between Capsules" (2017, Hinton et al.) from scratch.
- Recreate findings from "Analog Forecasting of Extreme-Causing Weather Patterns Using Deep Learning" (2020, Chattopadhyay et al.)

Kabuni Ventures Ltd., Deep Learning Intern

05/2021 – 07/2021 | (Virtual) London, England

Apply pre-trained Deep Learning models for the Human Pose Estimation task. Use extracted Pose Information to suggest improvements in a Cricket (Sport) Learner's technique, preventing inefficiency and injuries.

- Python** based implementation, with Deep Learning framework of choice being **PyTorch**.
- Torchvision's **KeypointRCNN** class finetuned for best accuracy used for the **Human Pose Estimation** (HPE) task. Used to generate time series pose data from video clips.
- Recurrent Neural Net** used for maximizing accuracy at detection of potential errors in technique from gathered time series pose data.

Otonomy IO, Autonomous Robotics & AI Intern

06/2020 – 08/2020 | (Virtual) Delaware, USA

- Automate last mile delivery through self-driving rovers that operate on sidewalks
- Setting up of cloud-based training and deployment pipelines for Deep Learning models utilizing **AWS** services, including but not limited to: **S3**, **EC2**, **SageMaker**
- Pipelines for the following frameworks were setup: **TensorFlow**, **PyTorch**

Projects

Interpretable Convolutional Neural Networks , Term Project, CS60021 🔗 <ul style="list-style-type: none"> Guided by the instructor, Prof. Sourangshu Bhattacharya, and research scholar Soumi Das. For the class CS60021, <i>Scalable Data Mining</i>, taken in Fall 2021 at IIT Kharagpur. Implement "Convolutional Dynamic Alignment Networks for Interpretable Classifications" (2021, Böhle et al.) using PyTorch as Deep Learning framework of choice. 	08/2021 – 11/2021
NumpyNet , Self Project 🔗 Building a Neural Network with nothing but NumPy . <ul style="list-style-type: none"> Layers implemented: Dense, Sigmoid, ReLU, Tanh Error functions implemented: Binary Cross Entropy, Mean Absolute Error, Mean Squared Error Optimizers implemented: Stochastic Gradient Descent 	05/2021 – 06/2021
Boolean Algebra Solver , Term Project, EC31003 🔗 <ul style="list-style-type: none"> Guided by Prof. Goutam Saha. For the class EC31003, <i>Digital Electronic Circuits</i>, taken in Fall 2020, at IIT Kharagpur. Design and presented the software "Boolean Algebra Solver" that solves many modern day Boolean Algebra problems like K-Map, Quine-McCluskey Algorithm, Hazard Detection and Removal, Hamming Code Generation, etc. C# based implementation. 	08/2020 – 11/2020
Practical Auto-Encoders , Self Project 🔗 <ul style="list-style-type: none"> Auto-Encoders for Image Super Resolution Github 🔗 Auto-Encoders for Image De-Noising Github 🔗 Implemented in Python using Keras with TensorFlow 2 backend. 	04/2020
parkMyCar , Microsoft presents Innovation Hackathon, an initiative of IncubateIND 🔗 <ul style="list-style-type: none"> Developed in 24 hours at Microsoft presents Innovation Hackathon, an initiative of IncubateIND, powered by Microsoft Azure. Provides real-time car park availability, also enables you to list personal land for parking. Developed using MapMyIndia APIs and hosted on Microsoft Azure servers. Tools used: HTML, CSS, JavaScript, Python (<i>Flask</i>). 	12/2019

Achievements and Test Scores

Graduate Record Examination (GRE) , ETS 🔗 Quant: 169/170 Verbal: 163/170 AWA: 4/6 Total: 332/340	10/2021
Test Of English as a Foreign Language (TOEFL) , ETS 🔗 Reading: 30/30 Listening: 28/30 Speaking: 26/30 Writing: 28/30 Total: 112/120	10/2021
Animal Breed Classification AI Challenge , Dockship 🔗 Classify images of Cats and Dogs into 37 given breeds . Achieved Global Rank 40 in the challenge. Use PyTorch as framework to build based classifier (with ResNet-152 backbone). Implement Learning Rate Decay. Achieved a test accuracy of ~93% and a 94.1 F1 score on public leaderboard.	07/2021
Data Sprint #41: Fruits Recognition , DPhi 🔗 Classify images of Fruits into 131 given classes . Achieved joint Global Rank 2 in the challenge. Use PyTorch as the framework to build classifier with ResNeXt-101 backbone. Implement Learning Rate Decay. Achieved a test score of 99.9951 on public leaderboard.	07/2021
Joint Entrance Examination (JEE) Advanced , IIT Kanpur All India Rank: 1098 Top 0.1% in 1,100,000+ JEE (Mains) applicants Top 0.5% in 230,000+ JEE (Mains) qualifiers	05/2018
Joint Entrance Examination (JEE) Mains , Central Board of Secondary Education All India Rank: 3264 Top 0.3% in 1,100,000+ applicants Qualified for JEE (Advanced)	04/2018
KVPY Fellowship , Department of Science and Technology, Government of India 🔗 Kishore Vaigyanik Protsahan Yojana fellowship awarded in high school with national rank 854	01/2017