

Parth Laturia

◇ [Github](#) ◇ [Linkedin](#) ◇ [Email](#) ◇ +91 9672315957

EDUCATION

Indian Institute of Technology Bombay

2018-2022

- Pursuing **Bachelor of Technology (with Honors)** in Computer Science and Engineering, *CPI: 9.59/10.00*
- Pursuing **Minor** in Artificial Intelligence and Data Science

Disha Delphi Public School

2016-2017

- CBSE Intermediate/+2, *Percentage: 95.2 %*

Gyan Mata Vidya Vihar

2006-2015

- CBSE Matriculation, *CPI: 10.00 / 10.00*

RESEARCH PAPERS

- *How to play Notakto: Can reinforcement learning achieve optimal play on combinatorial games?* (2020)
Zhenhua Chen, Chuhua Wang, **Parth Laturia**, David Crandall, Saul Blanco
[Paper](#) published at [AAAI-RLG 2021](#)
- *Doc2Video: Effective Consumption of Instructional Documents* (2021)
Parth Laturia, Prateksha Udhayanan, Dev Chauhan, Darshan Khandelwal, Suryateja BV, Stefano Petrangeli, Balaji Vasani Srinivasan
Paper submitted at [International Conference on Intelligent User Interface](#)
- *SPEAR : Semi-supervised Data Programming in Python* (2021)
Guttu Sai Abhishek, Harshad Ingole, **Parth Laturia**, Vineeth Dorna, Ayush Maheshwari, Ganesh Ramakrishnan, Rishabh Iyer
[Paper](#) to be submitted at the [Journal of Machine Learning Research](#)

RESEARCH EXPERIENCE

Winning Notakto with Reinforcement Learning —*RL, games*

Summer 2020

Guides: [Prof. Saul Blanco](#), [Prof. David Crandall](#)

[Indiana University, U.S.A](#)

- Co-Authored a paper titled "How to play Notakto?" published in **AAAI-Reinforcement Learning & Games**, '21
- Trained **UCB** based RL model from scratch using **1 Million** games of self-play to maximize win in Notakto
- Incorporated Monte Carlo Policy using **Every Visit** Approach and NN binarization for **space-time** optimization

Semi Supervised Data Programming (SPEAR) —*ML, Deep Learning*

Jan 2021 - Jul 2021

Guide: [Prof. Ganesh Ramakrishnan](#) — *RnD Project*

[IIT BOMBAY](#)

- Co-Authored a paper available at arXiv for submission at Journal of Machine Learning Research (**JMLR**), '21
- Developed a **Labeling** Function based module to reduce Annotation efforts and improve the correctness metrics
- Trained a High level Supervision encompassing **4** algorithms to learn from Rules generalizing Labeled **Exemplars**
- Implemented a **rule denoising** algorithm based on **Implication loss** to achieve high **F1-Score** & Accuracy

PROFESSIONAL EXPERIENCE

Doc2Video for Personalized Consumption —*ML, Algorithms, CV*

Summer 2021

Guide: [Balaji Vasani Srinivasan](#)

[Adobe Research Lab, Bangalore](#)

- Co-Authored a **patent-disclosure** and a paper for submission at Intelligent **User Interface** Conference, '22
- Automated conversion of instructional **document** to illustrative **video** tailored to user **expertise** and choices
- Embodied Clustering, Weak **Supervision** and Question Answering Modules to automate the **modality** selection
- Utilized GTTS to generate **voice over** and ffmpeg, moviepy to stitch the **coherent** clip pieces into final video

ATM's Predictive Maintenance —*Data Science, Process Development*

Winter 2020

Guide: [Prof. Siuli Mukhopadhyay](#)

[Bank of Baroda](#)

- Built a "**Smart ATM**" based on Regression model and cross-validation technique to warn for serious **faults**
- Reviewed Literature on Classification based **Failure Prediction** and extracted **2-sized** Pattern based Features

Noise Filtering by Stethoscope —*Machine Learning*

Winter 2019

Guide: [Adarsha K](#)

[Ayudevices, IIT Bombay](#)

- Conducted literature survey and tested algorithms for cancelling the noise for the Developed Digital stethoscope
- Executed **Recursive** Least Square and Least Mean Square Algorithm to filter out noises from the heart sound
- Collectively Implemented **Deep learning RNN** model for classifying Heart sounds as Normal or Abnormal

KEY ACADEMIC ACHIEVEMENTS

- Secured All India Rank **3** in **JEE Main Paper 1** out of **1.2 Million** candidates (2018)
- Achieved All India Rank **29** in **JEE Advanced** out of **163K** candidates (2018)
- Accomplished a perfect **10.0/10.0** performance index (SPI) in the **spring** semester of the **3rd** year (2021)
- Recipient of the Kishore Vaigyanik Protsahan Yojana (**KVPY**) fellowship with All India Rank **103** (2017)
- Earned the National Talent Search Examination (**NTSE**) fellowship by NCERT, Government of India (2016)
- Secured **4th** Rank and a **Gold** Certificate in **Technothon** Championship, held by **IIT Guwahati** (2014)
- Obtained **International** Rank **3** in the **International Mathematics Olympiad** held by **SOF** (2013)

OLYMPIADS

- Completed the **12-day** Orientation-Cum-Selection Camp for **IChO**, HBCSE (2018)
- Completed the **20-day** Orientation-Cum-Selection Camp for **IAO**, HBCSE (amongst **top 35** in India) (2015)
- Awarded **Gold Medal** for being placed among the top 35 students in **INChO**, HBCSE (2018)
- Qualified for Indian National Physics Olympiad (**INPhO**) (amongst top **396** students in India) (2017)
- Qualified for Indian National Astronomy Olympiad (**INAO**), top **275** students in India (2017,2016,2015,2014)
- Qualified for Indian National Junior Science Olympiad (**INJSO**), top **300** students in India (2014)
- Amongst **National top 1%** in National Standard Examination in Chemistry (**NSEC**) (2017)
- Amongst **National top 1%** in National Standard Examination in Physics (**NSEP**) (2017)

KEY PROJECTS

Developing Adversarially Robust Attacks —*ML, Deep Learning, Security* Spring 2021
Guide: [Prof. Sunita Sarawagi](#) | Course Project [Advanced Machine Learning](#)

- Analyzed FGSM and PGD based **Attacks** by pruning and varying **models** and norms to discern their severity
- Modified **TRADES** defense by changing the perturbation algorithm to secure **98.1%** accuracy on MNIST

SCLP Based Compiler—*Programming Languages, Algorithms* Spring 2021
Guide: [Prof. Uday Khedker](#) | Course Project [Implementation of Programming Languages Lab](#)

- Implemented scanning, **parsing**, AST, TAC and RTL stages with visibility of output at each intermediate stage
- Ensured that illegal tokens, syntax errors and semantic **errors** in the C-like compiler are robustly **flagged**

Restaurant Management System —*DBMS, Development* Spring 2021
Guide: [Prof. Umesh Bellur](#) | Course Project [Database and Information Systems Lab](#)

- Established a Robust System populated by Owner, Employees and Customers performing essential **user actions**
- Employed PostgreSQL with PgAdmin4 to maintain **Dynamic** Database and NodeJS to link it with the frontend
- Supported Time Series Analytics, Automated Dish **Recommender** and Atomicity to enhance the user experience

Buffer Overflow Attacks and Defenses—*Computer Security, Architecture* Autumn 2020
Guide: [Prof. Bernard Menezes](#) | Course Project [Computer Architecture](#)

- Demonstrated the Stack and Heap based **buffer overflow** exploits along with **defenses** against them
- Performed a case study on the **Code Red Worm** exploit paired with the ways of **protection** against it

Low-Dose Tomographic Reconstruction—*Statistics, Image Processing* Spring 2020
Guide: [Prof. Ajit Rajwade](#) | Course Project [Advanced Image Processing](#)

- Reconstructed test images from **low dose** projections and **Re-irradiation** in regions of significant changes
- Formulated **Weights** map using FBP and Z-test to quantify influence of **prior** templates on the reconstruction
- Implemented the modified FISTA package; tuned regularization parameters to achieve **RMSE** as low as **0.0749**

Question Bank Application —*Backend Development, Programming Language* Autumn 2019
Guide: [Prof. Amitabha Sanyal](#) | Course Project [Software Systems Lab](#)

- Developed a User-Authenticated Question bank storing questions and involving Question Addition in **Django**
- Devised a Search and Filter Panel based on Question Tags using **Topic Hierarchy**, **Databasing** and SQL
- Incorporated **Paper generation** feature in the Bank along with exporting and downloading them as PDF

Prevention of DOS Attacks —*Network Security* Summer 2019
[WnCC](#) | [Seasons of Code](#) [IIT BOMBAY](#)

- Devised Server Multi-Client message transfer protocol using **Socket** programming & **PoP3** algorithm in C++
- Studied the **Rampart** algorithm implementation for protecting Web Applications from CPU exhaustion attacks

Mastermind Solver—*Optimization, Algorithms* Spring 2019
Guide: [Prof. Amitabha Sanyal](#) | Course Project [Abstractions and Paradigms in Programming](#)

- Remodelled a two-player game Mastermind using **Racket** GUI library with the user using mouse as input
- Enforced the 5-Guess and **Mini-max Algorithm** with Alpha-Beta Pruning to identify the user's secret code
- Incorporated **Genetic** Algorithm and **Functional** programming to return secret code for tougher game levels

OTHER PROJECTS

- ◇ **Causal Intervention on Time Series** (Prof. [Sunita Sarawagi](#) | BTech Project) - Predicting **anomalies** and their confounders based on **multivariate time series** data using counterfactual explanations
- ◇ **XV6 System Development** (Prof. [Mythili Vutukuru](#) | Operating Systems) - Developed the Scheduling, Synchronization and Memory Management of Processes in XV6 OS entirely in C & X86 Assembly Language
- ◇ **Modelling Network Systems** (Prof. [Varsha Apte](#) | Computer Networks) - Simulated the working of an efficient Network system comprising of multiple bridges and nodes using the Spanning Tree Protocol
- ◇ **CS based Restoration** (Prof. [Ajit Rajwade](#) | Image Processing) - Implemented ISTA, OMP and **LASSO** techniques over **2D-DCT** Basis and Haar Wavelet Basis to reconstruct the **test** image data-set

TECHNICAL SKILLS

Programming	Matlab, RStudio, SQLite, Spark, Java, Prolog, Python, Cypher, Racket, VHDL, C++
Data Science	Tensorflow, Pytorch, Jupyter, GoogleColab, Scikit, Panda, StatsModels, PuLP
Software Skills	Wireshark, Gnuplot, Make, CMake, Git, Auto-CAD, SolidWorks, OpenCV, L ^A T _E X
Development	HTML, CSS, JavaScript, Django, AngularJS, Bootstrap, NodeJS, Beamer

INTERESTS

Machine Learning, Probability and Statistics, Algorithms, Logics

COURSES UNDERTAKEN

Data Structures & Algorithms Automata Theory	Data Analysis & Interpretation Digital Logic Design	Advanced Image Processing Logic for Computer Science
Numerical Analysis Database Systems + Lab	Advanced Machine Learning Compilers + Lab	Regression Analysis Intro to Probability Theory
Statistical Inference	AI & Machine Learning + Lab	Intelligent & Learning Agents*

LEADERSHIP POSITIONS

**to be completed by Dec 2021*

Department General Secretary—*Computer Science and Engineering*

April 2021 - Present

- Spearheading a council of **15** members, committed to serve socio-academic and sportive interests of the students
- Appointed **6** Placement Coordinators and a CyberSecurity Club Manager for the execution of student activities
- An active member of the Department **Policy** Formation Committee to ensure student participation in the same

Teaching Assistant

- Statistical Inference (Minor) under [Prof. Siuli Mukhopadhyay](#) Aug 2021 - Present
- Logic for Computer Science under [Prof. Krishna. S](#) Mar 2021 - May 2021
- Computer Programming and Utilization under [Prof. Kameswari](#) and [Prof. Bhaskaran](#) Nov 2020 - Feb 2021

Department Academic Mentor—*Department Academic Mentorship Programme*

May 2021 - Present

- Selected in a team of **34** mentors from **70+** applicants after interviews and peer reviews to mentor sophomores

Interview Co-ordinator—*Institute Placement Cell*

Dec 2020

- Coordinated with a team of **250+** members for interviews of the **1700+** students and tests for **15+** firms

Class Representative—*Computer Science and Engineering Association*

July 2020 - May 2021

- Represent the batch of **125+** students in Dept. Council and promote **progress** by solving the academic issues
- Link the Department **faculty** pool with the students and make the batch aware of all the **academic** updates

Social Secretary—*Computer Science and Engineering Association*

April 2019 - March 2020

- Responsible for **planning** and organizing all social and cultural events for **1000+** students of CSE department

Events Co-ordinator—*Mood Indigo*

July 2019 - December 2019

- Incentivized participation for flagship **competitions** by facilitation of astounding opportunities for winners
- Enhanced experience of **100,000+** visitors Judges by assembling lounges strategically placed in **550+** acres

EXTRACURRICULARS

- Co-Founder of **Femeal**: An initiative aiming to heal PCOS; Won the On-Campus Round of **Hult Prize** (2020)
- Represented **India** in **Asian Universities Alliance** Chulalongkorn Program on "**Humanizing Digital 2021**" (2021)
- Served as a **Volunteer** at Lions Eye Hospital to help poor and needy patients in the **COVID** Pandemic (2021)
- Engaged in the **AUA Nazarbayev** University Overseas Study Program on "**Data Science and AI**" (2021)
- One of the **12** Editors of Bitstream, **CSE Department Newsletter**; Contributed to **2** of its articles (2021)
- Engineered an App-controlled **Bot** in **XLR8** and Remote Controlled **Flight** maneuver in **RC Plane** (2018)
- Constituent of the Media and **Marketing** Team of **TechFest** aimed at achieving exclusive coverage (2018)
- Volunteered **80+** hours in **National Service Scheme** to maintain **Greenery** at IIT Bombay Nursery (2018)
- Elected as the **Senior Head Boy** at **Gyan Mata Vidya Vihar**; Involved in Student **Leadership** Squad (2014)