

# Shramay Palta

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

☎ (+91) 9888264722 | ✉ shramaypalta@gmail.com | 🏠 shramay-palta.github.io | 🌐 shramay-palta | in shramay-palta

## Education

### Birla Institute of Technology and Science, Pilani (BITS Pilani)

Pilani, India

BACHELOR OF ENGINEERING, ELECTRICAL AND ELECTRONICS ENGINEERING

August 2017-Present

- University of Maryland — Undergraduate Research Thesis Fall 2020
- TurnoutNow LLC — Undergraduate Summer Intern 2019

### Central Board of Secondary Education

St. John's High School, Chandigarh

SENIOR SECONDARY

May 2017

- Aggregate percentage of **95.60%**
- **100/100** in Mathematics

### Central Board of Secondary Education

St. John's High School, Chandigarh

SECONDARY

May 2015

- CGPA **10.0/10.0**

## Research Experience

### Maryland Information and Network Dynamics (MIND) Lab, University of Maryland

College Park, Maryland, USA

RESEARCH ASSISTANT UNDER PROF. ASHOK AGRAWALA (UNDERGRADUATE RESEARCH THESIS)

May 2020 - Present

- Analyzing the spread of **COVID-19 and Flu virus** on campus using location and breathing data collected from **Spire Tags**. Part of the PROMETHEUS Project in collaboration with the School of Public Health.
- Designed algorithms to efficiently determine **proximity pairs for contact tracing** on a data set of more than **500K** data points. Generated proximity pairs between two users within a distance of 3 meters and within a span of 15 minutes from each other.
- Development of algorithms for **time series analysis** for **segmentation of breathing data** to identify singular breathing events and anomalies like talking, sneezing, laughter, cough etc.

### Global Health Centre, Graduate Institute of International and Development Studies

Geneva, Switzerland

RESEARCH INTERN UNDER AMANDEEP GILL, EXECUTIVE DIRECTOR, UNSG's PANEL ON DIGITAL COOPERATION

May 2020 - October 2020

- The International Digital Health and AI Research Collaborative (I-DAIR) Project seeks to advance the **UN Secretary General's (UNSG)** High-level Panel on Digital Cooperation's recommendations related to digital health, and targets set at the **World Health Organization (WHO)** on universal and quality health coverage.
- Researched the role of **micro-narratives** as proxy variables to fill in missing data and used **natural language techniques** to study the social, health, and impacts of the **COVID-19** crisis on various sections on the society.

## Industry Experience

### TurnoutNow LLC

Lancaster, Pennsylvania, USA

DATA SCIENCE INTERN

May 2019-July 2019

- Analyzed how Big Data from **25000+ IoT BLE Beacons** is created and captured by over **900+ IoT data capture devices (Session App)**.
- Used **vert.x-core framework** for capturing and storing this **Big Data** into **Redis**. Used Java to process it in real-time and **MongoDB** for archiving.
- Used **R** to generate **real-time recommendations** based on the attendee's live location on the show floor.
- The data was then analyzed in **Power BI Dashboards** which displayed an overall summary of the event with **natural language insights**.
- Understood the interaction of real-time natural language generation tools with live data connections and generated narratives for end users. These narratives provided controlled insights based on user inputs in concise natural language text.

## Teaching Assistantships

### Department of Computer Science and Information Systems, BITS Pilani

Pilani, India

TEACHING ASSISTANT FOR THE COURSE CS F469 INFORMATION RETRIEVAL UNDER PROF. ABHISHEK MEHTA

January 2020 - May 2020

- Undertook doubt sessions and taught concepts of **Information Retrieval and Python** to more than **100 students**.
- Provided inputs for lesson plans, developing course materials, teaching software, preparing question bank, project ideas and **evaluated course assignments** that accounted for **35%** of the course total.

### Department of Electrical and Electronics Engineering, BITS Pilani

Pilani, India

TEACHING ASSISTANT FOR THE COURSE EEE F244 MICROELECTRONIC CIRCUITS UNDER PROF. ANU GUPTA

January 2020 - May 2020

- Undertook doubt sessions and taught concepts of Microelectronic Circuits using **LTSpice** to more than **280 students**.
- Demonstrated writing net lists and performing circuit simulations for **Analog Circuit Design**.
- Provided inputs for preparing question bank, and **evaluated the online lab test** that accounted for **15%** of the course total.

## Projects

### Economic Psychology: Stock Market Prediction using BERT

BITS Pilani, India

DR. RAJNEESH CHOUBISA, ASSISTANT PROFESSOR, DEPT OF HSS, BITS PILANI

January 2021- Present

- Implemented a **neural network** for utilizing information in **SEC 8-K forms** for predicting the movement of the **S&P 500 index**.
- Used **BERT** for capturing the contextual information in the form of two methods: **Masked Language Modeling (MLM)** and **Next Sentence Predicting (NSP)**.

## Digi Yatra: Re-imagining Air Travel in India

*BITS Pilani, India*

DR. VISHAL GUPTA, ASSISTANT PROFESSOR, DEPT OF CSIS, BITS PILANI

*January 2020-May 2020*

- An initiative by the **Ministry of Civil Aviation, Government of India** that aims to revolutionize air travel in the country.
- Explored the implications of Machine Learning and Artificial Intelligence as an asset to this program.
- Studied the security and privacy challenges involved in implementing technologies like **facial recognition, passenger tracking, recommender systems, etc.**

## Darknet Insights using R and Python

*BITS Pilani, India*

DR. VISHAL GUPTA, ASSISTANT PROFESSOR, DEPT OF CSIS, BITS PILANI

*August 2019-December 2019*

- Used information from DNS queries to predict a **DDoS attack** from Darknet data from **Center for Applied Internet Data Analysis (CAIDA)** supercomputer servers of the **University of California, San Diego (UCSD)**.
- Implemented **Python scripts for feature extraction** (like TTL, IP length, Packet Count etc.) and **CAIDA's internal tool, corsaro** for large scale analysis of trace data.
- Used **vector quantization algorithms including K-means and EM** on the extracted features to predict DDoS attacks.

## Cross-Lingual Document Translator

*BITS Pilani, India*

DR. LAVIKA GOEL, ASSISTANT PROFESSOR, DEPT OF CSIS, BITS PILANI

*August 2019 - December 2019*

- Built and implemented a Cross-Lingual Document Translator using **Statistical Machine Translation Model** for **Dutch and English** documents.
- Implemented the **IBM Model 1** for lexical translation and alignment along with the **Expectation Maximisation (EM) algorithm** to build and train the translator for a corpus of over **2 million sentences**.
- Used ensemble techniques like **Bagging and Boosting** to improve the precision and recall of the CLIR.

## Conferences and Events

### Microsoft Inspire 2019

*Las Vegas, Nevada, USA*

ONSITE DATA TECHNICIAN, TURNOUTNOW LLC

*July 2019*

- Deployed **900+ IoT data capturing devices** throughout the event venue to capture real time attendee location data from over **25,000 attendees**.
- Analyzed the flow and use of data captured by these devices for such Corporate Conference Events and how that data provides **real time analysis** based on high resolution **behavioral and demographic data**.

### Cisco Live 2019

*San Diego, California, USA*

ONSITE DATA TECHNICIAN, TURNOUTNOW LLC

*June 2019*

- Implemented a methodological and practical approach to deploy the receivers at the conference venue and efficiently track over **20,000 attendees**.
- Deployed TurnoutNow's data capturing devices along with **Cisco Meraki APs** to capture attendee location throughout the event.
- Learnt how the data capturing ability of the hardware changes according to **human traffic and real time interference** from various wireless devices deployed at the conferences.

## Skills

### Languages

Python, R, SQL, Linux/Unix shell, Java, C++, C, Assembly Language.

### Tools

Pandas, NumPy, scikit-learn, Matplotlib, Jupyter, Git, Power BI, Amazon Web Services (AWS), MySQL, LaTeX, Redis, OpenResty, MongoDB, MATLAB, LTspice, Proteus.

### Courses

Information Retrieval, Machine Learning, Discrete Structures, Object Oriented Programming, Computer Programming, Operating Systems, Microprocessors, Digital Design, Probability and Statistics, Calculus.

### OS

MacOS, Linux, Windows, FreeBSD.

## Achievements

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|-----------|--|----------------------------|
| 2010      | <b>World Robot Olympiad</b> , Represented India at the World Robot Olympiad held in Manila, Philippines and managed to secure a <b>world rank of 31</b> in my category.  | <i>Manila, Philippines</i> |
| 2010      | <b>Indian Robot Olympiad</b> , Awarded the <b>1st Runners Up Award</b> in my category for the north chapter.   | <i>Delhi, India</i>        |
| 2015      | <b>National Merit Holder</b> , One of the <b>top 0.1%</b> scorers across India in the board examinations conducted by Central Board of Secondary Education; Received Letter of Honour from the HRD Minister, Govt. of India. | <i>Chandigarh, India</i>   |
| 2015      | <b>National Level Science Talent Search Examination (NSTSE)</b> , Secured state-wise rank in <b>top 1%</b> in the competition organised by Unified Council.  | <i>Chandigarh, India</i>   |
| 2010-2016 | <b>SJOBA Scholar</b> , Consistently among the <b>top 3 students of my batch</b> and honoured with the scholar's award for <b>7 consecutive years</b> .   | <i>Chandigarh, India</i>   |

## Extracurriculars

### Punjabi Cultural Association (PCA), BITS Pilani

*Pilani, India*

CULTURAL SECRETARY

*March 2019 - June 2020*

- Responsible for mentoring and leading an organisation of over 150 students to help organise cultural events related to the heritage of Punjab and showcase them to the students of the college.

### BITS Pilani Athletics Team

*Pilani, India*

MEMBER

*January 2018-November 2018*

- Short distance sprinter specialising in 100, 200 and 400m races.