

# Shramay Palta

UNIVERSITY OF MARYLAND, COLLEGE PARK

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## Education

### University of Maryland College Park

DOCTOR OF PHILOSOPHY, COMPUTER SCIENCE. **GPA: 4.00/4.00**

Working with **Professor Rachel Rudinger**.

College Park, Maryland, USA

August 2021-Present

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

BACHELOR OF ENGINEERING, ELECTRICAL AND ELECTRONICS ENGINEERING . **FIRST DIVISION**

Thesis Supervisor: **Dr. Ashok Agrawala (UMD)** and **Dr. Navneet Gupta (BITS)**.

Pilani, India

August 2017-May 2021

## Research Experience

### Computational Linguistics and Information Processing (CLIP) Lab, University of Maryland Institute for Advanced Computer Studies (UMIACS)

College Park, Maryland, USA

GRADUATE STUDENT UNDER PROF. RACHEL RUDINGER

November 2021 - Present

- Investigating modern-day CommonSense NLP Models and datasets like Delphi, COMET, ATOMIC, CommonSenseQA to determine if they gave an implicit or explicit cultural bias baked into them.
- Preparing a dataset of test bed questions that can be used to stress test these models using examples of cultural and social norms, material and physical differences to prove such biases.

### Human-Data Interaction Group, University of Maryland

College Park, Maryland, USA

GRADUATE RESEARCH ASSISTANT UNDER PROF. LEO ZHICHENG LIU

September 2021 - March 2022

- Using Natural Language Processing Techniques to harvest design feedback from Visualization Comments on Social Platforms like Reddit.
- Crawled ~**26400** posts from **/r/dataisbeautiful** to get ~**2.5 Million** comments to be used for the study.
- A qualitative study of **600** sampled comments was used to derive meaningful taxonomy for prominent dimensions and categories for online visualization feedback.
- Used three **traditional classifiers: Naïve Bayes, Decision Tree, and Random Forest**, and a base **BERT** model for classification.

### 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 - February 2021

- 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.
- Developed 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 DR. 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 of 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.

## Projects

### Detecting Dietary Activity with Wearable Earphones

College Park, Maryland

PROF. NIRUPAM ROY, DEPT. OF COMPUTER SCIENCE, UNIVERSITY OF MARYLAND

September 2021- December 2021

- Developed a technique to detect the types of food being consumed using **eSense**, a consumer wireless earphone device by Bell Labs.
- Used data from the microphone to **detect chewing activity** and classify the food being chewed as **solid, liquid or semi-solid**.
- Choosing **Convolutional Neural Networks (CNNs)** as the feature extractor, used standard **Conv2d** layers and a standard training and evaluation procedure to train the models both with and without the **Mel Spectrogram**.

## Economic Psychology: Stock Market Prediction using BERT

*BITS Pilani, India*

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

*January 2021- May 2021*

- 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, 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, 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, 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.

## Skills

<b>Languages</b>	Python, R, SQL, Linux/Unix shell, Java, C++, C, Assembly Language.
<b>Tools</b>	Pandas, NumPy, NLTK, spacy, Keras, TensorFlow, PyTorch, scikit-learn, Matplotlib, Jupyter, Git, $\text{\LaTeX}$ , MATLAB, MySQL. CommonSense Reasoning and Natural Language Understanding, How and Why AI Answers Questions, Advanced Numerical
<b>Key Courses</b>	Optimization, Wireless and Mobile Systems for the IoT, Information Retrieval, Machine Learning, Discrete Structures, Object Oriented Programming, Computer Programming, Operating Systems.
<b>OS</b>	MacOS, Linux, Windows, FreeBSD.

## Achievements

2021	<b>Dean's Fellowship and Chair's Fellowship Award</b> , Awarded the Graduate School Dean's Fellowship and the Chair's Fellowship Award due to outstanding academic achievement.	<i>College Park, Maryland</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>
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>New Delhi, India</i>