Shramay Palta

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Education

University of Maryland College Park   *College Park, Maryland, USA*

Doctor of Philosophy, Computer Science. **GPA: 4.00/4.00**   *August 2021-Present*

Working with **Professor Rachel Rudinger.**

Birla Institute of Technology and Science, Pilani (BITS Pilani)   *Pilani, India*

Bachelor of Engineering, Electrical and Electronics Engineering . **First Division**   *August 2017-May 2021*

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

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**.
- Used 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 a 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

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

Achievements

2021	**Dean's Fellowship and Chair's Fellowship Award**, Awarded the Graduate School Dean's Fellowship and the Chair's Fellowship Award due to outstanding academic achievement.	*College Park, Maryland*
2015	**National Merit Holder**, One of the **top 0.1%** 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.	*Chandigarh, India*
2010	**World Robot Olympiad**, Represented India at the World Robot Olympiad held in Manila, Philippines and managed to secure a **world rank of 31** in my category.	*Manila, Philippines*
2010	**Indian Robot Olympiad**, Awarded the **1st Runners Up Award** in my category for the north chapter.	*New Delhi, India*