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Portfolio

Aman Priyanshu

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Exploring Tech through the Lens of AI, Cyber Security and Research. I am deeply passionate about Deep Learning, Cyber Security and the Research bringing together these two vast fields. My research interests lie in the field of Privacy-Preserving Machine Learning, Deep Learning, Reinforcement Learning, Spiking Neural Networks and Cyber Security.

Projects

DP-HyperparamTuning **Aug 2021**

- DP-HyperparamTuning offers an array of tools for fast and easy hypertuning of various hyperparameters for the DP-SGD algorithm. We proposed a novel, customizable reward function that allows users to define a single objective function for establishing their desired privacy-utility tradeoff.

Hexa Lite **Aug 2021**

- Created an unsupervised machine learning to extract contextually similar texts. The project was used in indexing Academic Literature, Law Precedents, and Financial Records. The project won *Code Innovation Series* - a Hackathon in association with *GitHub*.

Augmented Face Detection API for Professional Image Approval **Jul 2021**

- The app performs obstruction detection, spoof detection, blur detection and environment approval. Utilized Deep Neural Networks and Genetic Algorithms to achieve these goals in low computational time. The project won 1st place in *HackRx 2.0 by Bajaj Finserv.*

DeCrise **May 2021**

- DeCrise is an online platform that acts as an aggregator for public support/utility services which uses continual-federated-learning to create a quick response information retrieval system during a natural disaster. The project won 1st place in *The ACM UCM Datathon*.

Voix **Apr 2021**

- A social-media platform employing machine learning and differential privacy to promote civic engagement while protecting user-privacy. The project won under the *Community & Civic Engagement for UC Berkeley's CalHacks Hackathon*.

Positions of Responsibility

Undergraduate Research Assistant **May 2021 — Present**
Manipal Institute of Technology Karnataka, India

- Working under the supervision of Professors Balachandra Muniyal and Nisha P. Shetty on machine learning approaches to solve problems in the field of selective encryption and privacy-preserving machine learning.

Reviewer **Aug 2021**
BlackboxNLP 2021

- Reviewed papers for BlackboxNLP 2021, collocated with EMNLP2021. The goal of this workshop was to bring together people who are attempting to peek inside the neural network black box.

Expertise Sub-Head, Artificial Intelligence **Feb 2021 — Present**
Research Society Manipal Karnataka, India

- Leading and mentoring peers within RSM for Artificial Intelligence, with a focus on integrating machine learning and privacy. Research Society Manipal is an organization that focuses on research in different fields.

Technical Head **Jun 2021 — Present**
Cryptonite Student Project

- Technical Head of Cryptonite - the official Cyber Security Student Project of MIT, Manipal. Participated in multiple CTF competitions, ranked 18th in India on CTFtimes (2021). Developed and led research projects on Privacy-Preserving Machine Learning.

Machine Learning and Web Crawling Intern **Jan 2020 — Feb 2020**
Oniria Pets

- Interned at Oniria pets as a Machine Learning and Web Crawling Developer for Data Extraction and Management. Employed BERT for precise feature extraction pertaining to hotel prices, billing systems, locations etc. on data scraped from Hotel Websites. Used Selenium and Scrapy for extraction.

Google Code In mentor **Dec 2019 — Jan 2020**
TensorFlow User Group (TFUG)

- Mentored at Google Code-in for TensorFlow User Group (TFUG) - GCI'19.

Education

B.Tech in Information Technology, Manipal Institute of Technology, GPA: 8.44/10.00 **Jul 2019 — Present**

Technical Skills

Programming	Python, Java, C, C++, MATLAB, Julia, Go, Latex
Technical Skills	PyTorch, TensorFlow, Scikit-Learn, Numpy, Cuda, FastAPI, Flask

Publications

1. **Priyanshu, A.**, Naidu, R., Mireshghallah, F. & Malekzadeh, M. Efficient Hyperparameter Optimization for Differentially Private Deep Learning. *Accepted at the Privacy Preserving Machine Learning Workshop, ACM CCS 2021*. https://arxiv.org/abs/2108.03888 (2021).
2. **Priyanshu, A.**, Vardhan, A., Sivakumar, S., Vijay, S. & Chhabra, N. ”Something Something Hota Hai!” An Explainable Approach towards Sentiment Analysis on Indian Code-Mixed Data. *Accepted at Workshop on Noisy User-generated Text (W-NUT), EMNLP 2021* (2021).
3. **Priyanshu, A.**, Vardhan, A., Sivakumar, S., Vijay, S. & Chhabra, N. ExCode-Mixed: Explainable Approaches towards Sentiment Analysis on Code-Mixed Data using BERT models. https://arxiv.org/abs/2109.03200 (2021).
4. Naidu, R., **Priyanshu, A.**, Kumar, A., Kotti, S., Wang, H. & Mireshghallah, F. When Differential Privacy Meets Interpretability: A Case Study. *Accepted at the Responsible Computer Vision Workshop, CVPR 2021 and Privacy Preserving Machine Learning Workshop, ACM CCS 2021*. https://arxiv.org/abs/2106.13203 (2021).
5. **Priyanshu, A.**, Sinha, M. & Mehta, S. Continual Distributed Learning for Crisis Management. *Accepted at the 3rd Workshop on Continual and Multimodal Learning for Internet of Things, IJCAI 2021*. https://arxiv.org/abs/2104.12876 (2021).
6. **Priyanshu, A.** & Naidu, R. FedPandemic: A Cross-Device Federated Learning Approach Towards Elementary Prognosis of Diseases During a Pandemic. *Accepted at the Machine Learning for Preventing and Combating Pandemics and the Distributed and Private Machine Learning Workshops, ICLR 2021*. https://arxiv.org/abs/2104.01864 (2021).
7. **Priyanshu, A.**, Das, V. R., Rajiv Moghe, S., Rathod, H., Medicherla, S. S., Shail Chhabra, M. & Shastri, S. Stance Classification with Improved Elementary Classifiers Using Lemmatization (Grand Challenge). *2020 IEEE Sixth International Conference on Multimedia Big Data (BigMM).* https://www.doi.org/10.1109/BigMM50055.2020.00077 (2020).

Awards

First Prize - Code Innovation Series - associated with GitHub **Aug 2021**

- Innovation Series Hackathon was the hackathon organized by by Manipal Institute of Technology.
- Employed Document-Embedding for measuring contextual similarity between multiple pages and given search-queries.

First Prize - HackRx by Bajaj Finserv **Jul 2021**

- HackRx is the Annual Hackathon hosted by Bajaj Finserv.
- Used Deep Learning and Classical Image processing to achieve a face verification and profile-rank estimation task. The methodology out-performed classic Deep Learning methods. Created an API for the same.

First Prize - ACM UCM Datathon - UC Merced **May 2021**

- Won the ACM UCM Datathon, built DeCrise, an online platform that acts as an aggregator for public support/utility services for fast-response during a major crisis or disaster.

Runners-Up - Paper Presentation - IEEE SBM Manipal **Apr 2021**

- Presented a preliminary investigation of Federated Learning integrated with Continual Learning for Crisis Management.

First Prize - Community & Civic Engagement track of CalHacks Hackathon **Apr 2021**

- Won under the Community & Civic Engagement track of CalHacks Hackathon organized by UC Berkeley.
- Built Voix, an anonymous platform for uplifting communities and promoting civic participation. It is a social media platform that utilizes privacy-enabled machine learning to recover ideas affecting communities and bring them to the top of our platform while conserving user identity.

Runners-Up - Enigma: TechTatva 2020 (Machine Learning Competition) **Sep 2020**

- Came runners-up in Enigma 2020, reconstructed the classical version of VGGish in Tensorflow 2.0 and integrated it with elementary machine-learning models for categorical classification of Audio.

Runners-Up - IEEE BigMM Data Challenge - IEEE Grand-Challenge **Aug 2020**

- Came runners-up in IEEE Grand-Challenge for harassment detection on tweets. Utilized Elementary Classifiers for Sentiment Analysis.
- The team was invited to present a paper in IEEE Sixth International Conference on Multimedia Big Data (BigMM).

Scholarship Recipient - Intel Labs **Jan 2020**

- Honored to be selected as one of the recipients of the Intel Edge AI Scholarship Program.
- Learnt about Machine Learning Implementation on the Edge.