HUNAR BATRA

i@hunarbatra.com | hunarbatra.com | Linkedin | GitHub | Google Scholar

EDUCATION

University of Oxford – *MSc Advanced Computer Science* **[Graduation- Nov 2022]**

Dissertation title: "Protein Language Representation Learning to predict SARS-CoV-2 mutational landscape", under Prof. Peter Minary

University of Delhi – *BSc (Hons) Computer Science* – 8.42 CGPA, First Division Honours **[Class of 2020]**

RESEARCH EXPERIENCE [3 years part-time research exp.]

***Privacy Preserving ML Researcher (EWADA)* – Oxford Human Centred AI Group, University of Oxford** **[Nov 2021 – Present]**

Building decentralised web apps with PPML based recommendations for SOLID under Prof. **Tim Berners Lee**

***Research Lead* – Oxford Rhodes AI Lab** **[May – Oct 2022]**

Leveraging GNNs to predict climate closures equation using symbolic regression in collaboration with **CalTech** (CLiMA), **MIT** & **NASA JPL**

***Language Modelling Research* – Computational Biology Group, University of Oxford** **[April – Oct 2022]**

Applying language modelling to predict COVID-19 mutations using transformer-based models & AlphaFold2 under Prof. Peter Minary

***Chatbot Development Research* – University of Oxford** **[Feb – Aug 2022]**

Developed a Question-Answering language model for the Philosophy Dept to help convey their research work over website/messenger

***NLP Student Researcher* – Department of Computer Science, University of Delhi** **[March 2020 – July 2021]**

Researched & developed multiple projects- GPT-3 use-case model extractor, Ensemble ML Fake News detection, GPT-2 Title Generation. COVID-19 News Summariser using transformers, Medical QA bot. Co-authored and published papers in IEEE & Springer Singapore

***Computer Vision Student Researcher* – AI Research Lab, University of Delhi** **[June – Sept 2019]**

Built a Computer Vision based Assistive System for Autonomous Vehicles. Compiled Darknet with OpenCV for real-time predictions

WORK EXPERIENCE [1 year full-time work exp.]

***Mobile Robotics Engineer* – Swift Robotics** **[Aug 2020 – Sept 2021]**

Developed Flask REST API to livestream video processed with Computer Vision techniques (OpenCV, image stitching- KNNs)

Built a React Native application which interacts with ROS melodic nodes to control robot's navigation & visualised LiDAR odometry

***Co-Founder* – HushTech Solutions** **[June 2019 – July 2021]**

Self-taught NLP engineer; developed omni-channel messenger chatbots & RPA solutions for businesses such as a DIET classifier email bot

***Machine Learning Engineer* – Omdena** *(One of the 28 Global AI experts selected)* **[March – June 2020]**

Applied statistical models: LDA topic modelling, VAR, ARIMA & EDA over COVID-19 policies. Results showcased at UN AI Summit

***Mobile Application Development Intern* – Impute Inc.** **[March – June 2019]**

Developed & extensively trained a contextual conversation QA agent for Fluent8 iOS app. Deployed webhooks on Firebase Cloud Function

***Chatbot Development Intern* – Inverted Sense** **[Dec 2018 – March 2019]**

Built chatbots using Twilio & developed an in-built shopping cart with up-selling resulting in higher lead conversions & ROAS

PROJECTS | Github : github.com/hunarbatra

- **CoVBERT:** COVID-19 mutation prediction language model [Link]
- **GraphSAGE LSTM & BiLSTM Aggregators**: Merged in PyTorch Geometric Package [Link]
- **HunAI:** DialoGPT DSTC telegram buddy bot
- **MUCE:** GPT-3 based requirement specification use-case extractor
- **TiGen:** GPT-2 based SEO-optimised Research Article Title Generator
- **CoVShorts:** Transformer-based abstractive COVID-19 news summariser
- **Real Time Voice Cloning:** Transfer Learning based voice cloning on the recorded input to generate TTS

AWARDS & ACHIEVEMENTS

- **Google Women in Computer Science** Generation Scholarship EMEA, 2022
- **Grace Hopper Conference Scholar**, Department of Computer Science, University of Oxford, 2022
- Deep Learning Theory Summer School Full-funding, Simons Institute for Theory of Computing, UC Berkeley, 2022
- **Student of the Year & Rank 3,** Department of Computer Science, University of Delhi, 2020
- The Mars Generation **24 under 24** Award for Leaders & Innovators in STEM, 2019
- **National Finalist, Smart India Hackathon** Software Edition, (out of 5,000 teams) in India's largest hackathon by MHRD Govt. of India, 2019
- **Highest GPA** in Data Structure, Machine Learning, Computer Graphics, Android, Software Eng, System Programming, PHP, Microprocessor
- **National Winner**, Summer with Google (out of 20,000 participants), 2018

SKILLS

Python, C++, C, Javascript, SQL, App Dev (Native, React Native), Web Dev (HTML, CSS, React.js, TypeScript, Node.js, Flask)
PyTorch, PyTorch Geometric [Merged PR], TensorFlow, JAX, OpenCV, Kubernetes, Google Cloud Platform, ROS

RESEARCH PUBLICATIONS | Google Scholar

1. Medbot: Conversational Artificial Intelligence powered Chatbot for delivering Telehealth after COVID-19, **IEEE** 5th International Conference on Communications and Electronic Systems (ICCES 2020); Urmil Bharti, Deepali Bajaj, **Hunar Batra** et al,. IEEE Xplore [Link]
2. Serverless Deployment of a Voice-Bot for Visually Impaired, International Conference on Applied Soft Computing & Communication Networks (ACN 2020); Deepali Bajaj, Urmil Bharti, **Hunar Batra** et al,. Book Chapter - **Springer** Singapore [Link]
3. CoVShorts: News Summarization application based on Deep NLP transformers for SARS-CoV-2, **IEEE** 9th International Conference on Reliability, Infocom Technologies and Optimization (ICRITO 2021); **Hunar Batra**, Akansha J, et al. - IEEE [Link]

4. MUCE - A Multilingual Use Case Model Extractor using GPT-3; Deepali Bajaj, **Hunar Batra** et. al, International Journal of Information Technology (IJIT 2022), **Springer** [Link]
5. CovFakeBot: a machine learning based chatbot using ensemble learning technique for COVID-19 fake news detection; **Hunar Batra** et. al, International Journal of Artificial Intelligence and Soft Computing 2022 [Link]
6. TiGen - Title Generator based on Deep NLP Transformer Model for Scholarly Literature; **Hunar Batra**, Eshika G et. al; Under Review (2021)
7. Protein Language Models are self-supervised mutagenesis learners; **Hunar Batra**, Peter Minary; Under Review (2022)

INVITED TALKS & WORKSHOPS

ICML 2022, Oxford Women in Computer Science Virtual Social – Highlighting Women Researchers in Machine Learning
Oxford Computer Science Conference 2022 – Protein Language Modelling to generate de novo SARS-CoV-2 mutations [Slides]
Oxbridge Women in Computer Science Conference 2022 – Protein Language Modelling to generate de novo SARS-CoV-2 mutations [Slides]
Ryerson University (The DMZ, Think Outside the Valley 2020) – Process Automation with Chatbots [Link]
HackOn Hackathon 2020 – Ok Google! Let's build an action for Google Assistant [Link]
SRCC, University of Delhi 2019 – Chatbot Development for Marketing (youngest invited speaker)
Google DevFest New Delhi 2019 – Project showcase, Google Developer Students Club

POSITIONS OF RESPONSIBILITY

Reviewer – ICML 2022, AI4ABM workshop [May 2022]
Student Entrepreneur – Oxford University Innovation and Oxford Science Enterprises [June - July 2022]
Summer Fellow – Global Leadership Initiative, Oxford Character Project [June - July 2022]
IT Officer – Oxford Women in Business [April - Oct 2022]
IT Officer – Oxford Women in Computer Science [Oct 2021 - Oct 2022]
MSc Academic Representative – Department of Computer Science, University of Oxford [Oct 2021 - Oct 2022]
Solutions Challenge Lead – Google Developer Student Club Oxford [Oct 2021 - Jan 2022]
Exam Marker – Mathematical Institute, University of Oxford [Oct 2021 - Nov 2021]
Lead – Google Developer Student Club (One of the few students selected globally by Google) [Jan 2019 - Aug 2020]
Mentor – Google Code-in at TensorFlow [Nov 2019 - Jan 2020]