Hunar Batra

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Education

B.Sc (Honours) Computer Science, Class of 2020,
University of Delhi (Accredited by NAAC Grade 'A+')
C.G.P.A - **8.42 / 10**, First Division
Academic Achievements and Honours

- Student of the Year, Department of Computer Science, 2020 - *for all-rounder performance*
- Scored S.G.P.A - 9.5 / 10 in sixth semester
- Achieved the Highest Grade Point in the university in Data Structures, Machine Learning, Android Programming, Software Engineering, System Programming, PHP Programming, Computer Graphics, Microprocessor subjects

Modern School Vasant Vihar, New Delhi Class of 2017
Grade 12th (CBSE) - 92%
Grade 10th (CBSE) - 9.6 CGPA

Research Experience

Student Researcher, Department of Computer Science 03/2020 – 06/2020
University of Delhi & IIT Delhi

- Developed a Voice-based personal assistant web application for visually impaired students, embedded with NLP capabilities, built over a serverless architecture with a NoSQL Cloud Database - Cloud Firestore
- Single-handedly built & trained the feedback collection NLP agent, tagged entities, added contextual input-output conversational flow. Created Node.js webhook to handle responses, deployed on Google Cloud Platform
- Embedded voice interaction using WebSpeech API Speech Recognition & Speech Synthesis interfaces, websocket for bi-directional real-time communication. Performed benchmarking, load, soak, sink testing & built GNU plots
- Co-Authored a research paper on this project, accepted to International Conference on Applied Soft Computing & Communication Networks (ACN'20), to be published in Springer

Student Researcher, Artificial Intelligence Research Lab 06/2019 – 09/2019
University of Delhi

- Self-initiated research work under Dr. Amita Kapoor, wherein I built an Assistive System for Autonomous Vehicles for vehicles and lane detection, based on Deep Learning & Computer Vision
- Compiled Darknet, an open-source neural network & YOLOv3 with OpenCV for real-time predictions. Implemented a bash script to automate bulk testing & mean average precision calculation
- Achieved 99.07% accuracy for detecting vehicles and lanes using Histogram of Oriented Gradients (HOG) & a Linear Support Vector Machine Classifier on HSV colour space

Work Experience

Mobile Robotics Engineer, UVRobots 08/2020 – present | London, UK

- Developed a Flask REST API for streaming live video from Raspberry Pi using the Motion-JPG technique. Processed the video, generated depth & disparity maps using OpenCV.
- Generated room laser scan visualisations using LiDAR real-time data, roboviz & PyLidar libraries
- Built a React Native mobile application integrated with ROS melodic nodes, to control the Robot Lamp navigation for disinfection & lucidly developed the front-end of the application

Co-Founder, HushTech Solutions 06/2019 – present | New Delhi, India

- Self-taught Conversational AI developer, developing omni-channel messenger chatbots powered by Natural Language Processing (NLP) to help businesses automate their customer interactions, marketing & lead generation
- Built intelligent full-funnel integrated messaging chatbots with data analytics abilities
- Conducted extensive research into the conversational technology market, requirements of the clients & shipped chatbots for websites and popular messaging platforms

Machine Learning Engineer, Omdena AI 03/2020 – 06/2020 | Palo Alto, USA

- Selected as one of the 28 Global AI Experts to work on the AI Pandemics project in collaboration with AI for Peace
- Performed Latent Dirichlet Allocation (LDA) topic modelling over a dataset of scraped COVID-19 news articles to analyse the impact of government policies over the vulnerable population.
- Used time series analysis on OxGCRT & Mobility Datasets to find correlations between policy implementations & it's impact on number of cases & mobility. Further, implemented moving averages & vector autoregression (VAR)
- Conducted exploratory data analysis and built categorical heat maps for analysis. Results to be published at the United Nations AI for Good Summit 2020

Mobile Application Development Intern, Impute Inc. 04/2019 – 07/2019 | Tokyo, Japan

- Developed a Hybrid Voice-Assistant based on Natural Language Processing for the Fluent8 iOS Application, integrated with a corpora of daily-life topics to help users improve their conversational skills.
- Extensively trained the NLP agent & enabled contextual conversation using Dialogflow AI & Node.js client SDK
- Deployed webhooks on Cloud Function for Firebase for response retrieval. Designed the Conversational User Interface (CUI) & directed fallback user queries to external APIs to enhance the conversational experience

Chatbot Development Intern, Inverted Sense 12/2018 – 04/2019 | New Delhi, India

- Built messenger chatbots for real businesses using Twilio, Chatfuel, Janis.ai. Worked on designing, building, training, testing bots & integrated interactive UI with suggestion cards
- Proposed & successfully developed an in-built shopping cart, instant order email alert & up-selling feature which led to higher lead conversions & ROAS

Research Publications

- 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]
- 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,. **Springer** [To be published]

Projects | github.com/hunarbatra

HunAI [Python, GPT]
A pre-trained response generation, DialoGPT DSTC model based Telegram Bot buddy, trained on Reddit discussions
CoRelief [React.js, Kendo UI, API.AI]
Natural Language Processing based web chatbot to help fight COVID-19 related anxieties & support mental health
UAV Delivery Drone [ArduPilot Copter]
Unmanned Aerial Vehicle for delivering vaccinations and disaster relief material to remote areas. Awarded The Mars Generation 24 under 24 Award in recognition of this project
Voixt [JS, HTML, CSS, Chrome TTS]
A Chrome Extension to read aloud the textual content on any browser tab, enabling TTS [Link]
Real Time Voice Cloning [Python, Synthesizer, TensorFlow]
Transfer Learning based voice cloning on the recorded input to generate Text-to-Speech (TTS)
Apka Chikitsak [Node.js, SSML, GCP]
Multilingual voice application to provide telehealth, healthcare literacy & information in rural India
All India Emergency Helpline [Node.js, SSML, GCP]
Hybrid NLP bot to provide emergency helpline info. 5K+/m users on Google Assistant [Link]
Songify [Python, GPT 2]
A GPT-2 based song lyrics generator based on a transformer natural language processing model
Vehicle and Lane Detection [Python, SciKit]
99.07% accuracy for detecting vehicles, lanes using HOG & SVM on HSV colour space
Rekognition [Java, XML, ML Kit]
Native Android app for Text Recognition, Object Recognition & Facial Features Recognition

Awards and Honours

- **First Indian** to receive **The Mars Generation 24 under 24** Award - *Leader & Innovator in STEAM category,* 2019
- **National Finalist**, Smart India Hackathon Software Edition (out of 5,000 teams), *India's largest hackathon by MHRD Govt. of India,* 2019
- **Young Inventor**, Tech Will Save Us, 2019
- Developer Student Clubs Lead, Google Developers, 2020
- **Paper Presentation** at 5th International Conference on Communication and Electronic Systems, ICCES'20, IEEE
- Ideation **Paper Presentation** on 'Ingestible Robots' at 15th WONCA World Rural Health Conference, 2018
- **National Winner**, Summer with Google (out of 20,000 participants), 2018
- World Rank **1642**, Google CodeJam 2020
- Winner, Smart City Challenge, IIT Delhi, 2018
- Winner, National Level B-Plan Competition, MSME, Govt. of India, 2019
- Rank **15**, All India Gen-Z Leadership Olympiad, 2018
- Gold Award, Digital Champions Program, Reliance JIO, 2018

Skills

C++, C, Python, Javascript, Java, HTML, CSS, PHP, SQL, Application Development (Native, React Native)

Tools & Frameworks: Node.js, React.js, TensorFlow, Flask, OpenCV, Dialogflow, git, bash, Firebase, Google Cloud Platform, ROS

Positions of Responsibilty & Volunteering

Founder & Lead – Developer Student Clubs, Google Developers 01/2019 – 07/2020
One of the few students selected globally by Google

- Conducted 10+ workshops, trained 300+ students, delivered talks on Cloud, Machine Learning, Data Science, Web & Mobile Application Development.
- Facilitated Google Cloud Platform Crash Course, Explore ML & hackathons to foster a strong technical developer community. Supervised & led live projects

Teaching Assistant - Computer Literacy Program 07/2019 – 03/2020
University of Delhi

- Served as a Teaching Assistant in Computer Literacy Program, which aims to teach women foundational basics of Computer Science in order to help them restart their career.
- Undertook weekly classes, elucidated core basics & hands-on over general-purpose industry tools

Mentor – Google Code-in at TensorFlow 12/2019 – 01/2020

- Mentored students to get started with open source developments for TensorFlow.
- Developed problem statements on BERT model, beginner friendly resources, reviewed submissions, provided constructive feedback & guidance

Invited Talks

Process Automation with Chatbots
Think Outside the Valley, The DMZ (Ryerson University), World's leading accelerator for Tech Startups [Link]
Ok, Google! Let's build an Action for Google Assistant
HackOn, A Pan-India Virtual Hackathon [Link]
Chatbot Development for Marketing
Youngest Guest Speaker at Shri Ram College of Commerce, University of Delhi
The Power of Technology - Developer Student Clubs
Google Developer Groups DevFest 2019, India's Largest Developer Conference

MOOCs

Machine Learning, Stanford University - *Coursera - July'20*
Intro to TensorFlow 2.0 for Deep Learning - *Udacity - June'19*
Google Cloud Platform Big Data and Machine Learning Fundamentals - *Google Cloud, Coursera - April'19*