Anukriti **Kumar**

Research Fellow, Microsoft Research

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Education

July 2021 | **Delhi Technological University (Formerly, Delhi College of Engineering)** **GPA: 9.82/10**
August 2017 | B.Tech student in Information Technology (**University Rank: 2** in 2360 students)

Research Experience

Present | **Microsoft Research | Technology and Empowerment Group** [🌐] **Bangalore, India**
July 2021 | *Research Fellow | Advisors: Dr. Saikat Guha, Tanuja Ganu, Dr. Mohit Jain*
- Developing tools for automatically converting inaccessible printed content (currently, research papers) into standard compliant EPUBs and making them accessible to the visually-impaired.
- Developing an android application which uses smartphone camera to track various eye parameters. These are then analyzed to provide actionable feedback to the users to encourage behavior change.

Dec 2020 | **Delhi Technological University | Biometric Research Lab** [🌐] **Delhi, India**
Oct 2020 | *Research Intern | Advisor: Prof. Dinesh Kumar Vishwakarma*
Worked on building a robust system for the classification of traffic signs in real-time using deep neural networks and achieved an accuracy of around 97.6%, comparable to state-of-the-art architectures.

June 2021 | **Nanyang Technological University | Cyber Security Research Centre** [🌐] **Singapore**
Jan 2021 | *Research Intern | Advisors: Prof. Thambipillai Srikanthan, Prof. Siew-Kei Lam*
Implemented prototype based classification model for malware classification using static, behavioral and memory stats from limon sandbox along with hardware features to incorporate side-channel attacks.

Dec 2019 | **Indian Institute of Technology** [🌐] **Delhi, India**
Sept 2019 | *Undergraduate Research Intern | Mentor: Dr. Chetan Arora*
Research project where I worked on conventional 3D-CNN and Siamese neural network to learn effective feature representations from videos of human gait with distance metric learning for human identification.

July 2019 | **Samsung R&D Institute | Natural Language Understanding Team** [🌐] **Bengaluru, India**
May 2019 | *Student Trainee (Under CTO) | Mentor: Vikram Mupparthi*
Implemented an end-to-end solution for generating triplets (speaker, persona category and value) from real time conversation to make voice assistants personalized for daily use.

Industry Experience

Aug 2020 | **OCaml | Outreachy Internship Program** [🌐] **Remote**
May 2020 | *International Industrial Intern | Mentors: Guillaume Bury, Vincent Laviron*
Worked on reducing global mutable states from the OCaml compiler codebase by identifying parts of the compiler that use mutable states and also proposing refactoring changes to fix those issues.

July 2020 | **Linkedin | Performance Insights Team** [🌐] **Bangalore, India**
June 2020 | *Software Development Engineering Intern | Mentor: Saurabh Badhwar*
Worked on implementing Spark Jobs responsible for aggregating useful API metrics information from service call events and generating call tree data to provide useful insights to software developers.

June 2020 | **D.E. Shaw & Co. | Application Engineering Team** [🌐] **Hyderabad, India**
Apr 2020 | *System Intern | Mentor: Nithin Srikar Karnala*
Research project to build an AI-powered Slack Bot to assist the Helpdesk team in answering commonly asked questions. Also, implemented an application which creates a FAQ repository across various help channels.

Feb 2019 | **Bharti Airtel | Product Engineering Team** [🌐] **Gurugram, India**
Dec 2018 | *SDE Intern | Mentor: Bhupendra Niranjan*
Research Project on implementing and integrating biometric (eye) based liveness detection into their product for customer verification during purchase of a new sim card.

Publications

S=In Submission, C=Conference, W=Workshop, B=Book Chapter, J=Journal

[S.2] **i-Fit: Taking charge of eye fitness**
Anukriti Kumar, Mohit Jain, Nipun Kwatra
[Working Paper]

[S.1] **ChartParser: Automatic Chart Parsing for Print-Impaired** [🔗]
Anukriti Kumar, Tanuja Ganu, Saikat Guha
Scientific Document Understanding Workshop **[AAAI'23]**

[W.1] **Document Navigability: A Need for Print-Impaired** [🔗]
Anukriti Kumar, Tanuja Ganu, Saikat Guha
Accessibility, Vision and Autonomy Meet Workshop **[CVPR'22]**

[C.3] **Document Navigability: A Need for Print-Impaired** [🔗]
Anukriti Kumar, Tanuja Ganu, Saikat Guha
5th Assistive Technology Conference **[EMPOWER'22]**

[C.2] **Realistic face generation using a textual description** [🔗]
Anukriti Kumar, Anurag Mudgil, Nakul Dodeja, Dinesh Kumar Vishwakarma
(Virtual) **[ICCMC'21]**

[C.1] **Intelligent Transport System: Classification of Traffic Signs Using Deep Neural Networks in Real Time** [🔗]
Anukriti Kumar, Tanmay Singh, Dinesh Kumar Vishwakarma
(Virtual) **[ICCV'20]**

[B.1] **Artificial Intelligence (AI) at the Edge for Smart Cities Applications**
Anurag Mudgil, Anukriti Kumar, Anvit Negi, Arman Dhanda, Surendrabikram Thapa, S. Indu
Sustainable, Innovative and Intelligent Societies and Cities **[Springer]**

Awards and Achievements

Hackathons

- **Winner,** Citi Campus Innovation Challenge 3.0
- **Audience Choice Award,** Citi Campus Innovation Challenge 3.0
- **Winner,** Stratethon 2.0 by Optum
- **Winner, Sponsored Hack - Accelerate91 Future of Edge Computing** Microsoft Global Hackathon 2021
- **Runner Up,** Makeathon by American Express
- **National Finalist,** KPMG Ideation Challenge
- **Top 10,** Rakathon by Rakuten
- **Top 60 girls in India,** Wintathon by Linkedin
- **Top 6,** Vihaan by IEEE, DTU

Scholarships

- **Cargill Global Scholarship:** 1 in 10 students across India, received a scholarship of 5000 USD
- **NTU-India Connect Fellowship:** Fully-funded research internship for one semester at NTU, Singapore
- **Diversity Scholarship:** Student attendee (fully funded) for KubeCon, Flink Forward, PyData, ODSC West'20
- **Academic Scholarship:** Received scholarship from DTU in 1st, 4th year for academic excellence
- **Merit Scholarship:** Awarded scholar coat for being consistent topper in school for 5 years

Others

- Shortlisted for **Innovate India research and innovation program** by Delhi Government
- Selected for **Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS), 2020**
- Attended **ACM India Winter School on Fairness, Accountability, and Transparency in AI (by IIT, Kharagpur**
- Selected for **5th Summer School on AI (conducted by CVIT)**

Select Projects

CareWheel

- Developed a healthcare platform to bridge the gap between the elderly, their doctors and caretakers.
- Implemented various machine learning models for severity analysis, stress and mood detection, anomaly detection and close distance monitoring.
- Created whatsapp chatbot and a user dashboard for interacting with the users, tracking their health parameters/reports and alerting caretakers during emergencies.
- Conducted user interviews with various doctors and the elderly to understand the system's utility and future scope.

Multi-modal Emotion Recognition System

- Developed an ensemble model that gathers text, sound and video inputs to understand human emotions in real-time using MELD dataset.
- Used pre-trained word2vec embeddings, followed by 1-D CNN and LSTM for feature extraction and emotion classification from textual input.
- Performed audio signal discretization, log-mel-spectrogram extraction and used a Time Distributed Convolutional Neural Network for the audio input.
- Identified the face by using HOG feature descriptor and used pre-trained XCeption model for classifying human emotions from video input. Finally, assigned the majority class of emotion to the human.

Political Fake News Analysis

- Implemented a model to detect political fake news by using the statement and justification (context or background information) approach.
- Trained BERT uncased large model using LIAR-PLUS dataset along with additional data scraped from Politifact website and achieved an accuracy of 70% on the test set.

Stock Watch

- Developed a prototype to predict the future price of a stock of interest for the next quarter by doing fundamental and technical analysis using news articles, twitter posts as well as historical stock prices data.
- Implemented Extra Trees Classifier for final feature selection and XGBoost regressor model for stock price prediction.

Teaching and Leadership Roles

Participant Aug'21 - Present

Technology and Empowerment Reading Group, Microsoft Research, India
Active participant in our weekly reading group where I regularly present research papers and engage in discussions.

Host Aug'21

Hosted the Multi-modal networking session at IKDD 2021 where Dr. Vikas Raykar was our guest.

Mentor

- Mentorship Program 4.0 organized by Women Who Code, Delhi (Jan'22)
- SheHacks, Delhi's largest all women Hackathon organized by Climb, DTU (Apr'21)
- Toyota Code for safer India Hackathon, organized by IRSC (Dec'19)
- National Service Scheme (Aug'18-Aug'19)

Chairperson, Women in Tech Aug'20 - Aug'21

International Organization of Software Developers
Organized events to promote women in technology and mentored juniors to reach their next career milestone.

Head, Mobile Development Aug'19 - Aug'20

International Organization of Software Developers
Conducted Special Interest Groups (Tutorials) for students on various concepts related to application development.

Co-Head Aug'18 - Aug'19

Entrepreneurship Cell, DTU
Responsible for organizing various events like startup weekend, E-summit and other entrepreneurship workshops.

Skills

Languages	C++, C, Python, Java, SQL, HTML/CSS
ML Libraries	OpenCV, Keras, PyTorch, Tensorflow
Development	React, Android App Development, Flask, Basic Web Development
Relevant Coursework (Online)	Mathematics for Machine Learning, Sequence Models, Neural Networks and Deep Learning, Convolutional Neural Networks for Visual Recognition (Coursera), Android Application Development, Computer Vision: Deep Learning (Udemy), Machine Learning with Python (IBM)
Relevant Coursework (Classroom)	Linear Algebra and Differential Equations, Machine Learning, Pattern Recognition, Artificial Intelligence, Object Oriented Programming, Database Management Systems, Operating System, Data Structures and Algorithms