Anukriti **Kumar**

Research Fellow, Microsoft Research

anukriti12.github.io | anu1999kriti@gmail.com | github.com/Anukriti12 | Google Scholar | anukriti-kumar

Education

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

Research Experience

Present – **July 2021** | **Microsoft Research | Technology and Empowerment Group** [🌐] | **Bengaluru, India**
Research Fellow | Advisors: Dr. Saikat Guha, Tanuja Ganu, Dr. Mohit Jain
- Developing a system for making printed content accessible to those with vision impairment, leveraging state-of-the-art computer vision models to alleviate pressing challenges identified from user study and iterative feedback.
- Studying the potential of smartphone applications to develop healthy eye habits for preventing digital strain. The developed system tracks eye parameters, such as eye blink rate, and provide actionable feedback based on them.

June 2021 – **Jan 2021** | **Nanyang Technological University | Cyber Security Research Centre** [🌐] | **Singapore**
Undergraduate 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 – **Sept 2019** | **Indian Institute of Technology** [🌐] | **Delhi, India**
Research Intern | Mentor: Dr. Chetan Arora
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 – **May 2019** | **Samsung R&D Institute | Natural Language Understanding Team** [🌐] | **Bengaluru, India**
Student Trainee | 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.

Dec 2018 – **Sept 2018** | **Delhi Technological University | Biometric Research Lab** [🌐] | **Delhi, India**
Research Intern | Advisor: Prof. Dinesh Kumar Vishwakarma
Worked on developing 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.

Industry Experience

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

July 2020 – **June 2020** | **Linkedin | Performance Insights Team** [🌐] | **Bengaluru, India**
Software Development Engineering Intern | Mentor: Saurabh Badhwar
Implemented Spark jobs that aggregated API metrics from a service performance platform and generated call tree data in order to provide useful insights to software developers.

June 2020 – **Apr 2020** | **D.E. Shaw & Co. | Application Engineering Team** [🌐] | **Hyderabad, India**
System Intern | Mentor: Nithin Srikar Karnala
Designed and implemented an AI-powered Slack bot to improve the efficiency of the Helpdesk team in answering frequently asked questions. Created a centralized FAQ repository across various help channels for easy access to essential information.

Feb 2019 – **Dec 2018** | **Bharti Airtel | Product Engineering Team** [🌐] | **Gurugram, India**
SDE Intern | Mentor: Bhupendra Niranjan
Conducted a research project on integrating biometric (eye) based liveness detection into the company's product for customer verification during the purchase of a new SIM card.

Publications

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

[S.1] **i-Fit: Taking charge of eye fitness**
Anukriti Kumar, Mohit Jain, Nipun Kwatra
[Working Paper]

[W.2] **ChartParser: Automatic Chart Parsing for Print-Impaired** [🔗]
Anukriti Kumar, Tanuja Ganu, Saikat Guha
Scientific Document Understanding Workshop [**AAAI'23 Workshop**]

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

[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)**

Talks

Document Navigability: A Need for Print-Impaired
EMPOWER 2022, IIT Madras Research Park

Democratizing Printed Content
Technology and Empowerment Reading Group, Microsoft Research, India

Data Privacy with Federated Learning
Technology and Empowerment Reading Group, Microsoft Research, India

Data Security with Federated Learning - Industrial Use-Cases
Industry Expert Session, International Organization of Software Developers

Are We Excluding, If We Are Not Consciously Including
Cargill India Virtual International Women's Day event

Select Projects

CareWheel

- Developed a healthcare platform to deliver patient care to the elderly using sensor's data from an IOT wearable device.
- Created whatsapp chatbot and a user dashboard for interacting with the elderly, tracking their health parameters/reports and alerting caretakers during emergencies.

Multi-modal Emotion Recognition System

- Developed an ensemble model that gathers text, sound and video inputs to understand human emotions in real-time.
- 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 user's face using HOG feature descriptor and used pre-trained XCeption model for classifying human emotions from video input.

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 the guest speaker.

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 several women-centric hackathons and events during the technical fest
- Delivered multiple talks on open-source, android development, and research
- Organized an internship fair and a talk series by researchers from different institutions

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