# Dhruv Agarwal

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## RESEARCH INTERESTS

Responsible AI (LLMs/GenAI), Human-AI Interaction, Misinformation

## EDUCATION

**Cornell University** | ITHACA, USA
PhD in Information Science | 2022–Present
Advisor: Aditya Vashistha

**Ashoka University** | SONIPAT, INDIA
BS in Computer Science | 2016–2020
CGPA: 3.84 / 4.0 | Major: 3.98 / 4.0 | **Magna cum laude**
Thesis: Incentivizing Drivers to Collect Off-Route Pollution Data

## EXPERIENCE

**Microsoft Research** | RESEARCH FELLOW
Jun 2020 – Jul 2022 | Bangalore, India
- Developed Turn2Earn, a novel way of improving data coverage using vehicular crowdsensing.
- Mixed-effects modeling of air pollution using wind dispersion models and NASA pollutant data.
- Developed PollutionMapper, a system to analyze large-scale geospatial data and visualize it.

**Microsoft Research** | RESEARCH INTERN
May 2019 – Aug 2019 | Bangalore, India
- Designed a greedy algorithm to maximize city coverage for drive-by sensing.
- Library open-sourced by Microsoft: `github.com/microsoft/Modulo`
- Implemented by Ola Cabs (Uber's key competitor in India) — 300% coverage improvement.

**Mirabilis Design** | SOFTWARE ENGINEERING INTERN
Dec 2018 – Jan 2019 | Chennai, India
- Generated execution traces of ARM executables from QEMU source code for VisualSim software.

**Ampersand Design** | UI DEVELOPMENT INTERN
Jul 2017 – Aug 2017 | Gurgaon, India
- UI design and development of interaction-heavy web pages for the State Bank of India.

## RESEARCH PUBLICATIONS

1. AI-Assisted Deliberation to Combat Harmful Content on WhatsApp Groups.
   **D. Agarwal**, F. Shahid, A. Vashistha. [under review]

2. 'One Style Does Not Regulate All': Moderation Practices in Public and Private WhatsApp Groups.
   F. Shahid, **D. Agarwal**, A. Vashistha. [under review]

3. "If it is easy to understand then it will have value": Examining Perceptions of Explainable AI with Community Health Workers in Rural India. ACM CSCW 2024.
   **D. Agarwal**\*, C. T. Okolo\*, N. Dell, A. Vashistha.

4. PollutionMapper: Identifying Global Air Pollution Sources. ACM COMPASS 2023.
   **D. Agarwal**, P. Kumar, S. Iyengar.

5. India's "Aadhaar" Biometric ID: Structure, Security, and Vulnerabilities. Financial Crypto 2022.
   **D. Agarwal**\*, P.R. Tiwari\*, P. Jain, S. Dasgupta, D. Gupta. (21% acceptance rate)

6. Understanding Driver-Passenger Interactions in Vehicular Crowdsensing. ACM CSCW 2021.
   D. Agarwal, S. Agarwal, V. Singh, S. Iyengar, M. Jain. Methods Recognition Award.

7. Modulo: Drive-by Sensing at City-scale on the Cheap. ACM COMPASS 2020.
   D. Agarwal, S. Iyengar, M. Swaminathan, et al. Best Paper Award.

8. Poster: An Alternative to India's Reservation Policy. ACM COMPASS 2020.
   D. Sinha, O. Sahasrabudhe, D. Agarwal, D. Gupta.

9. Poster: System for Vehicle Selection in Drive-by Sensing. ACM SenSys 2019.
   D. Agarwal, S. Iyengar, M. Swaminathan.

## TECHNICAL SKILLS

Python • JavaScript • React • GeoSpatial tools                C/C++ • PHP • Bash • Git • SQL • Android
Applied AI (Sklearn & PyTorch) • MongoDB • Flask            Photoshop • Raspberry Pi • Arduino • LaTeX

## AWARDS AND RECOGNITION

**Quad Fellow**                                                         Schmidt Futures 2023
**Cornell University Fellow**                                        Cornell University 2022
**Winner – Edge Computing Track**                   Microsoft Global Hackathon 2021
**Undergraduate Research Excellence Award**   Computer Science Department, 2020
**Student Life Excellence Award**                        Office of Student Life, 2020
**Dean's List – All 8 Semesters**                Dean of Academic Affairs, 2016–2020
**Alok Bhatla True Marian Award**                   High School Instituted Award, 2016

## SERVICE

Reviewer — ACM CHI                                                        2023–2024
Reviewer — ACM CSCW                                                     2023–2024
Reviewer — ACM COMPASS                                               2021–2023

## MEDIA COVERAGE

### The Hindu
Ola, Microsoft to analyse street-level air quality

### The Business Insider
Ola and Microsoft come together to measure air quality on the streets of India's national capital

### The Economic Times
Ola partners with Microsoft Research to study street-level air quality in Delhi-NCR

## PROJECTS

### Exploring Human Bias in FIFA Ratings
Prediction of football players' future FIFA ratings from their previous ratings and on-ball actions.

### Fake News Challenge
An NLP approach to the Stance Detection problem using a novel "staged" technique.

### Beating Facial Obfuscation with ML
Convolutional autoencoder to recreate blurred, pixelated or blocked facial images.

### COVID-19 Multilingual Knowledgebase
FAQ website to combat misinformation surrounding the crisis in local Indian languages.

### VAHN: Vehicle Accident Hazard Notifier
A real-time smart city system for automatic detection and reporting of road accidents.

### Ashoka Menu and Shuttle Bot
Chatbot to inform students about mess menu, shuttle timings. 800 users and 190k messages.

Energy Sensing System for Dorms
Hardware prototype to monitor real-time energy wastage expressed in monetary loss.

## SELECTED COURSEWORK

| | |
|---|---|
| Math | Discrete Math • Probability & Statistics • Linear Algebra |
| Systems | Computer Organization • OS • PLDI (PLs) • Networks |
| Theory | Algorithms • Advanced Algorithms • Theory of Computation |
| AI/ML | Intro to ML • Advanced ML • Unstructured Information • NLP • How LLMs work |
| Security | Computer Security • Blockchain |
| HCI | Data Viz • New Geographies of Information Age • ICTD |
| | |
| TAship | Intro to ML • Discrete Math • New Geographies of Information Age |

## STUDENT ACTIVITIES

**University Sports Teams** | Ashoka University
August 2016 – May 2020
- Lawn Tennis – Gold in men's doubles, vice-captain, U-18 nationals
- Badminton – Gold in team event
- Football – Gold and silver at inter-varsity tournaments

**Technology Minister** | Ashoka University Student Government
March 2017 – March 2018
- Elected into 15-member Student Government. Nominated as Tech Minister by President.
- Introduced apps for campus life; technology consultant for 1500+ students.

**Volunteer Instructor** | Ad-hoc Workshops
August 2016 – Present
- Photoshop & Web Development – 3 sessions, 80 students
- Python for Physicists – 2 sessions, 30 students
- Google ExploreML – amongst 60 chosen out of 1000+ applicants.
- Computer Science Hepdesk – Weekly walk-in CS doubt sessions

## SERVICE & TEAMWORK

**Project Muskaan** | Founder & Head
July 2018 – May 2019
- Instituted a program to teach computers to kids from a rural background.
- The student body's most successful social initiative since Ashoka's inception.

**Agneepath – Sports Festival** | Founder & Fest Secretary
March 2017, November 2017, November 2019
- Curated and organised Ashoka's annual inter-varsity sports festival.
- Led 70-member team thrice in 4 years: team formation, organisation, delegation of work, execution.

**Banjaara – Cultural Festival** | Head of Technology
February 2017
- Developed website, digital solutions to organizational issues like entry coupons and certificates.