

# Dhruv Agarwal

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## RESEARCH INTERESTS

ICTD, Human-Computer Interaction, Systems  
Application Areas: Healthcare, Sustainability, Accessibility

## EDUCATION

**Cornell University** | ITHACA, USA

Ph.D. in Information Science | Since Fall 2022

Advisor: Prof. Aditya Vashistha

**Ashoka University** | SONIPAT, INDIA

P.G.D. in Advanced Studies and Research | 2019 - 2020

CGPA: **4.0** / 4.0 | **Summa cum laude**

Thesis: Incentivizing Drivers to Collect Off-Route Pollution Data

**Ashoka University** | SONIPAT, INDIA

B.Sc. (Hons.) in Computer Science | 2016 - 2019

CGPA: **3.84** / 4.0 | Major: **3.98** / 4.0 | **Magna cum laude**

## EXPERIENCE

**Microsoft Research** | RESEARCH FELLOW

Jun 2020 – Present | Bangalore, India

- Developed Turn2Earn, a novel way of improving data coverage using vehicular crowdsensing.
- Modelling air pollution (PM2.5) using wind dispersion models and NASA pollutant data.

**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: <https://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. "What Should I Explain Here?": Explainable AI in the Global South. Manuscript under preparation.  
**D. Agarwal\***, C. T. Okolo\*, N. Dell, A. Vashistha.
2. 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)
3. Understanding Driver-Passenger Interactions in Vehicular Crowdsensing. ACM CSCW 2021.  
**D. Agarwal**, S. Agarwal, V. Singh, S. Iyengar, M. Jain. **Methods Recognition Award**.
4. Modulo: Drive-by Sensing at City-scale on the Cheap. ACM COMPASS 2020.  
**D. Agarwal**, S. Iyengar, M. Swaminathan, et al. **Best Paper Award**.

5. Poster: An Alternative to India's Reservation Policy. ACM COMPASS 2020.  
D. Sinha, O. Sahasrabudhe, **D. Agarwal**, D. Gupta.
6. Poster: System for Vehicle Selection in Drive-by Sensing. ACM SenSys 2019.  
**D. Agarwal**, S. Iyengar, M. Swaminathan.

## AWARDS AND RECOGNITION

**Quad Fellow**  
**Cornell University Fellow**  
**Winner – Edge Computing Track**  
**Undergraduate Research Excellence Award**  
**Student Life Excellence Award**  
**Dean's List – All 8 Semesters**  
**Alok Bhatla True Marian Award**

Schmidt Futures 2022  
 Cornell University 2022  
 Microsoft Global Hackathon 2021  
 Computer Science Department, 2020  
 Office of Student Life, 2020  
 Dean of Academic Affairs, 2016–2020  
 School Instituted Award, 2016

## ACADEMIC SERVICE

**Program Committee – Posters & Notes**  
**Shadow Program Committee**

ACM COMPASS 2022  
 ACM COMPASS 2021

## TECHNICAL SKILLS

Python • JavaScript • React + Vue • PHP • Git  
 Hyperledger •  $\text{\LaTeX}$  • MongoDB • Flask • Keras

C++ • C • Bash • SQL • Java • Android  
 Photoshop • Arduino • Raspberry Pi

## 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 Processing
Security	Computer Security • Blockchain
HCI	Data Visualization • New Geographies of Information Age

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.