Perspectives on having (societal) impact through research

Venkat Padmanabhan Microsoft Research India

ACM India Summer School 02 Jun 2025

Questions

- Many questions:
 - What is research?
 - How can one find good problems?
 - What is impact?
 - How can one have impact through research?
- There is no one "right" answer to these and other questions!
- Personal opinions, not the views of my employer or any other org
- Personal opinions \Rightarrow undoubtedly biased!
- Please decide for yourself what works best for you

Themes

- Interesting problems are everywhere
- Use-inspired (basic) research
- Malleability of AI
- Don't forget the humans
- Collaboration and partnership
- Expect surprises

Research

- Create new knowledge and apply it in new ways
- Basic versus applied research: a false dichotomy?
- Use-inspired (basic) research: Pasteur's quadrant



Source: Pasteur's quadrant, Wikipedia

THE short out a care is a constraint of the foreign sports of the

"In later years it would sometimes be construed, thanks in part to AT&T's vast publicity apparatus, that scientists came to the Labs in the 1930s and 1940s for the good of science. But that was an incidental dividend of their work... Oliver Buckley, the Labs vice president, told his new employees, "Our job, essentially, is to devise and develop facilities which will enable two human beings anywhere in the world to talk to each other as clearly as if they were face to face and to do this economically as well as efficiently."

What is impact?



IIT Delhi CS Convocation Nov 2018 (afternoon)

A Kaleidoscope of Projects







Shiksha: Education



Responsible AI across language & culture



India's dismal road safety record: One death every four minutes

In fact, more than a tenth of the world's road deaths take place on India's roads, which carry less than 3% of the world's vehicles

Vijay C Roy | New Delhi November 14, 2015 Last Updated at 00:46 IST Source: Business Standard

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Key Risk Factors:

- Speed
- Drinking and driving

Road traffic injuries

Fact sheet Reviewed September 2016







If they follow previous vehicle technologies autonomous vehicles it will take one to three decades to dominate vehicle sales, and one or two more decades to dominate vehicle travel, and even at saturation a significant portion of vehicle travel may continue to be human operated, indicated by the dashed lines.

Source: Victoria Transport Policy Institute

It'll be a while before drivers disappear!

Nericell (ca. 2007)



Wireless Tilt Sensing



WiTilt v2.5 2.4GHz Wireless 3-axis Tilt Sensor 3/2/2006



- Earliest smartphone-based system for road & traffic monitoring
- Precursor to commercialization of smartphone-based insurance telematics



Nericell pioneered the use of smartphones as a vehicular sensing platform, at a time when these devices lacked the sensing capabilities that are commonplace today. Nericell showed how smartphones could be used to sense various aspects of road and traffic conditions. In addition to the technical achievements, it influenced a large body of research, inspired others to develop novel uses of smartphone sensors, and fostered new lines of academic and commercial research.

Lesson: Don't Forget the Human!

We were so bent on automation that we never seriously considered human-powered or human-augmented sensing





Consolation: we beat them to a paper!

Driver/Driving Context and Safety





Road traffic injuries

Fact sheet Reviewed September 2016





- Drinking and driving
- Helmets
- Seat-belts and child restraints

Distracted driving



What's missing?

Driver & driving context





Inertial sensors

HAMS: Harnessing Automobiles for Safety

Akshay Nambi, Venkat Padmanabhan, Satish Sangameswaran, and many others



- Smartphone serves as virtual harness that monitors drivers and their driving
- Low-cost system that can be retrofitted onto the existing base of vehicles
- Intelligent edge for efficient local processing of camera & other sensor data
- Driver training, license testing, fleet monitoring



Front camera (driver state)





Back camera (driving relative to environment)



Inertial sensors

Some Technical Innovations

- 1. Adaptive switching for computational efficiency
 - E.g., vehicle ranging
- 2. Auto-calibration for robust driver gaze tracking
 - E.g., tracking mirror scanning
- 3. Fine-grained trajectory tracking with minimal infrastructure
 - E.g., automated driver license testing

2. Gaze tracking



Facial Landmarks



- We use OpenFace [Baltrušaitis 2016], a state-of-the-art tool for facial landmark detection and head pose estimation
 - 68 landmark points \Rightarrow head pose
 - We identify a subset of 22 landmarks ⇒ 35% less expensive
- Challenges:
 - Frequent head and eye movement
 - Non-standard and variable camera orientation
 - Driver- and vehicle-specific variation

Incorporating Eye State

• Driver gaze depends on a combination of head pose and eye state







Auto-Calibration with Head Pose & Eye Gaze



Application of Gaze Tracking: Mirror Scanning



HAMS pilot in Maruti IDTR

- Used to flag inappropriate mirror scanning
 - 200+ training sessions (each lasting about an hour)
 - 140+ trainees
 - 12 instructors
 - 2200 video events out of which 1200 were rated
- Usefulness of HAMS:
 - 5-star: when HAMS was able to correctly identify trainee not scanning mirrors
 - 1-star: event generated was a false positive



40

20

% of videos

Manual license testing falls short

- Slow and tedious
- Subjective
- Prone to shortcuts being taken

The licensing system in India is corrupt and inefficient, while the mandatory driver training system is non-existent. There are 997 Regional Transport Offices (RTOs) in the country issuing over 1.15 crore fresh or renewed driving licences every year.¹⁶

59% PEOPLE DID NOT GIVE A TEST TO GET A DRIVER'S LICENSE



Source: SaveLIFE Foundation (Jul 2017)

Stumbled upon automated driver license testing through serendipity

Smart RTO Tracks for Automated Testing

- Significant initiative in several states
- But cost & coverage concerns



Pole-mounted cameras





Curb-hit sensors

HAMS-based License Testing

• Portable sensors





• Minimal track instrumentation



s







Lower cost & better coverage

Microsoft Research Al project automates driver's license tests in India





- Launched in Dehradun in 2019, now live in 34 RTOs
- 249,000+ automated tests till date, live in 36 RTOs, 62% pass rate
- +ve user feedback, unanticipated benefits (e.g., during pandemic)
- Partnerships: government, Maruti-Suzuki IDTR, SoftX
- Research collaborations: IIT-B, IIIT-H
- Open-source software



Uttarakhand CM's Award (2019-20)

Made it to the shortlist for the PM Award (2020)





Uttarakhand Hams-based Automater Driver License Testing

Interest from beyond India

Columbia (2020)

Our company is interested in introducing a smart driver ś license system in latin America.

We would like to know if it is possible that the system you have developed can be deployed in this region and for that we would like to have a representation of the HAMS to offer it in the latam market.

Spain (2020)

Hi Venkat, I would like to contact you to develop your HAMS project in Europe / Spain. I have as an alliance a Gold Parnership of Microsoft. Thank you very much beforehand for your help.

The Philippines (2025) (yesterday!) HAMS project

Hi Venkat,

We're working on a Government project to automate the driver license test and we're looking at replicating the system. I've seen the Github repository but I can't



Afrastructure

Future Decoded CEO Summit, Feb 2020

Impact on Road Safety?

Dear Venkat,

Hello, my name is <u>Michael Kremer</u>. I'm a Development Economist at the University of Chicago and the founder of the <u>Development Innovation Lab at the University of Chicago</u>.

During my recent visit to Punjab's Transport Department, I learned about Microsoft's "Harnessing AutoMobiles for Safety" (HAMS) project. We were impressed with the technology's potential to improve driver discipline and increase road safety in India.

From a research standpoint, we are interested in evaluating the effect of this intervention on changes in driving behavior patterns and road accidents. We are interested in using administrative data on accidents to estimate the impact of HAMS on road safety. This would ideally be an event study where the HAMS intervention is rolled out in one geographical area at a time.

Three-way Collaboration

RCT for societal interventions



A Kaleidoscope of Projects





Healthcare

- Access to healthcare in India is constrained by two broad factors:
 - Cost of specialized diagnostic equipment
 - Makes it unaffordable to deploy broadly
 - Availability of expertise
 - Low doctor-to-patient ratio: 7.3 per 10k patients (India ranks 134th out of 197 countries)
- Challenge: lowering cost while ensuring accuracy
- Approach: Leverage
 - Commodity device (smartphone) with software intelligence
 - Human + AI workflows



SmartKC Smartphone-based Corneal Topographer for Keratoconus Diagnosis

 FTEs Mohit Jain, Nipun Kwatra
 RFs Siddhartha Gairola
 Interns, Contractors
 Ophthalmologists
 Murtuza Bohra, Nadeem Shaheer
 Dr. Pallavi Joshi, Dr. Anand Balasubramaniam, Dr. Murali Kaushik (Sankara Eye Hospital)

Keratoconus Disease

Distorts cornea into a cone-like shape Impact teens Causes (partial) blindness

Affects 0.05% people globally

Affects 2.3% people in India: Genetics > Thinner and steeper corneas

Hot dry weather > irritation > rubbing



Diagnostics: Placido Disc



Cheap | Doctor needed | No digital record

Diagnostics: Corneal Topographers



Expensive No doctor needed Digital record

SmartKC

A low-cost portable corneal topographer, which captures the mire image and outputs curvature maps.





Remidio InstaKC

India's first Smartphone-Powered Innovation for Early Keratoconus Detection

Placido disc-based and Printed cone based corneal mapping for precise screening of keratoconus



DCTOR-IN-THE-LOOP CHATEOT

Mohit Jain Microsoft Research **Examples** Cataract Bot Onco Bot ASHA Bot

Key Insight

- Human expert + AI workflow
 - AI helps humans scale
 - Humans help AI be accurate



DILBot Workflow



DILBot Workflow (future queries)



Cataract Bot @ SANKARA EYE HOSPITAL (Bengaluru, Hyderabad, Jaipur)



1800+

Patients and Attendants

7500+

Questions Answered 18+

Experts (12+ Doctors, 6+ Coordinators)

90%+

'Yes' Answers

ASHA Bot



Deployed with Khushi Baby In Salumbar and Udaipur, Rajasthan

2,750+ASHAs (Community Health Worker) 500+ANMs (Auxiliary Nurse Midwife)

24,000+Questions

[1] ASHABot: An LLM-Powered Chatbot to Support the Informational Needs of Community Health Workers. CHI'25.

| ← 🔊 Khushi Baby ASHA Saheli 🤄 🚦 t | |
|--|--|
| अंतरा इंजेक्शन के दुष्प्रभाव क्या हैं? 8:14 | • Supports regional languages |
| You अंतरा इंजेक्शन के दुष्प्रभाव क्या हैं? अंतरा इंजेक्शन का उपयोग करने वाली महिला को मासिक धर्म में रक्तस्राव में बदलाव का अनुभव हो सकता है, जैसे कि हल्की अवधि, स्पॉटिंग, अनियमित रक्तस्राव, या एक वर्ष के बाद मासिक धर्म न होना। इंजेक्शन बंद करने के बाद सामान्य मासिक रक्तस्राव फिर से शुरू हो जाता है। 8:14 | • Instant answer: RAG over expert's curated KB |
| You अंतरा इंजेक्शन के दुष्प्रभाव क्या हैं? | Supports speech and text If ASHA Saboli |
| आगे क्या करना है? ≔ संबंधित सवाल अस्थानिक गर्भावस्था के मामले में क्या करें? 9.30 | does not know the answer: it asks multiple ANMs and combine their responses using a consensus algorithm. |
| अस्थानिक गर्भावस्था के मामले में क्या करें? क्षमा करें, मुझे इस प्रश्न का उत्तर नहीं पता। मैं एएनएम की हमारी टीम से जांच करूंगी और जल्द ही आपसे संपर्क करूंगी। इस बीच, आप मुझसे प्रश्न पूछना जारी रख सकते हैं। 9.31 | KB updates w/ consensus answers |



Build Your Own **expert** Bot within minutes Open sourced



A Kaleidoscope of Projects







Shiksha Copilot Empowering teachers to generate engaging learning experiences

Tanuja Ganu and Akshay Nambi

World of Teachers

- Teachers are the backbone of our education system
- Universal challenges
 - High teaching load
 - Large class sizes
 - Diversity of students in the class
 - Time management
 - Creating effective lesson plans
- Key challenge: engaging & contextual content to for best learning experience
- Solution: Shiksha copilot for teachers
 - Amplification through trained intermediary



Learning Experiences Grounded in Curriculum

| Shiksha copilot | | | | | D |
|---------------------------------------|---|-----|--------------|------------|---|
| Teacher Panel Dashboard Profile | Lesson Plan Details Info: Lesson Plan Type-5E, Board-KSEEB | | | | |
| Content Generation | Board * | | Medium* | | |
| Constation Status | KSEEB | × ¥ | english | × ¥ | |
| Generation status | Class * | | Subject * | | |
| 😕 Chatbot | 6 | ×× | Science Sem1 | × v | |
| My Schedules | Chapter * | | | | |
| | Select Chapter | | 6 | ~ | |
| pant FAQ | 1. COMPONENTS OF FOOD | | | | |
| | 2. SORTING MATERIALS INTO GROUPS | | | | |
| | 3. SEPARATION OF SUBSTANCES | | | | |
| | 4. GETTING TO KNOW PLANTS | | | | |
| | 5. BODY MOVEMENT | | | | |

Pedagogy Adaptation & Contextualization

| 🕽 Shiksha copilot | |
|--------------------|--|
| eacher Panel | Learning Outcomes Engage 🖉 Explore 🗸 Explain 🖻 Elaborate 🗹 Evaluate 🖻 Documents |
| Dashboard | |
| Profile | ELABORATE Phase Activity Plan: Components of Food Real-World Scenarios: |
| Content Generation | 1. Scenario for Topic 1.1 (What Do Different Food Items Contain?): In the diverse state of Karnataka, from the ragi mudde of the south to the jolada rotti of the north, how do the staple foods of these regions reflect the nutritional components derived from plants? |
| Generation Status | Description/Answer: Ragi mudde, a staple in southern Karnataka, is rich in dietary fibers, minerals, and vitamins, showcasing how plant-derived foods contribute essential nutrients. Similarly, jolada rotti, popular in northern Karnataka, is made from jowar (sorghum) and is a great source of carbohydrates, proteins, and dietary fiber, highlighting the nutritional diversity of plant-based foods. |
| Chatbot | 2. Scenario for Topic 1.2 (What Do Various Nutrients Do for Our Body?): Considering the coastal Karnataka diet, which includes a lot of fish, how does the inclusion of seafood contribute to a balanced nutrient intake? |
| My Schedules | Description/Answer: Seafood, especially fish, is a rich source of omega-3 fatty acids, proteins, and vitamins D and B2 (riboflavin). These nutrients are crucial for maintaining heart health, supporting mental and neurological development, and strengthening the immune system, illustrating the role of various nutrients in maintaining |
| I FAQ | a healthy body. |
| | ∠ Edit |
| | Feedback |
| | ○ Relevant 😊 ○ Moderately Relevant 😑 ○ Irrelevant 😑 |
| | |

Multilingual Interaction

| a copilot | | | | |
|------------------|---|--|---|---|
| el | Questions Real World Scenarios | Activities | Videos | E Documents |
| board | BEGINNER | | | |
| le | ಕರ್ನಾಟಕದ ಪ್ರಧಾನ ಆಹಾರಗಳಲ್ಲಿ ಪೌಷ್ಟಿಕಾಂಶದ ಅಂಶಗಳು | | | |
| | ವೈವಿಧ್ಯಮಯವಾದ ಕರ್ನಾಟಕ ರಾಜ್ಯದಲ್ಲಿ, ದಕ್ಷಿಣದ ರಾಗಿ ಮುದ್ದೆಂ ಪಡೆದ ಪೌಷ್ಟಿಕಾಂಶದ ಅಂಶಗಳನ್ನು ಹೇಗೆ ಪ್ರತಿಬಿಂಬಿಸುತ್ತವೆ? | ಯಿಂದ ಉತ್ತರದ ಜೋಳದ ರೊಟ್ಟಿಂ | ಯವರೆಗೆ, ಈ ಪ್ರದೇಶಗಳ ಪ್ರಮುಖ ಆಕ | ಹಾರಗಳು ಸಸ್ಯಗಳಿಂದ |
| itent Generation | ದಕ್ಷಿಣ ಕರ್ನಾಟಕದಲ್ಲಿ ಪ್ರಧಾನವಾಗಿರುವ ರಾಗಿ ಮುದ್ದೆಯು ಆಹಾರದ ನ | ಾರುಗಳು, ಖನಿಜಗಳು ಮತ್ತು ವಿಟಮಿನ್ | ್ಗಳಲ್ಲಿ ಸಮೃದ್ಧವಾಗಿದೆ, ಸಸ್ಯ ಮೂಲದ | ಆಹಾರಗಳು ಅಗತ್ಯವಾದ |
| eneration Status | ಪೋಷಕಾಂಶಗಳನ್ನು ಹೇಗೆ ಕೂಡುಗೆ ನೀಡುತ್ತವ ಎಂಬುದನ್ನು ತೋರಿಸುತ ತಯಾರಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಇದು ಕಾರ್ಬೋಹೈಡ್ರೇಟ್ಗಳು, ಪ್ರೋಟೀನ್ ವೈವಿಧ್ಯತೆಯನ್ನು ಎತ್ತಿ ತೋರಿಸುತ್ತದೆ. | ತ್ತದೆ. ಅದೀ ರೀತಿ, ಉತ್ತರ ಕರ್ನಾಟಕದಲ್ಲಿ 'ಳು ಮತ್ತು ಆಹಾರದ ಫೈಬರ್ನೆ ಉತ್ತವ | ್ಲ ಜನಪ್ರಿಯವಾಗಿರುವ ಜೋಳದ ರೂಟ್ಮ ಕು ಮೂಲವಾಗಿದೆ, ಇದು ಸಸ್ಯ ಆಧಾರಿತ (| ,ಯನ್ನು ಜೋಳದಂದ (ಬೇಳ) ಆಹಾರಗಳ ಪೌಷ್ಟಿಕಾಂಶದ |
| hatbot | INTERMEDIATE | | | |
| | ಕರ್ನಾಟಕ ಥಾಲಿಯನ್ನು ಸಮತೋಲನಗೊಳಿಸುವುದು | | | |
| ly Schedules | ಸಮತೋಲಿತ ಆಹಾರದ ಉದಾಹರಣೆಯಾಗುವಂತೆ ಸಾಂಪ್ರದಾಯಿಕ | ಸಮತೋಲಿತ ಆಹಾರದ ಉದಾಹರಣೆಯಾಗುವಂತೆ ಸಾಂಪ್ರದಾಯಿಕ ಕರ್ನಾಟಕದ ಥಾಲಿಯನ್ನು ಹೇಗೆ ಮಾರ್ಪಡಿಸಬಹುದು? | | |
| AO | ಕಂದು ಅಕ್ಕಿ (ಕಾರ್ಬೋಹೈಡ್ರೇಟ್ಗಳು ಮತ್ತು ಫೈಬರ್ಗಾಗಿ), ಸಾಂಬಾರ್ (ಮಸೂರದಿಂದ ಪೋಟೀನ್ಗಳು ಮತ್ತು ತರಕಾರಿಗಳಿಂದ ಜೀವಸತ್ಕಗಳು), ಎಲೆಗಳ ಸೊಪ್ಪಿನ ಒಂದು ಬದಿ (ವಿಟಮಿನ್ಗಳು ಮತ್ತು ಖನಿಜಗಳಿಗಾಗಿ) ಮತ್ತು ಮೊಸರು ಮುಂತಾದ ವಿವಿಧ ಭಕ್ಷ್ಯಗಳನ್ನು ಸೇರಿಸುವ ಮೂಲಕ ಸಾಂಪ್ರದಾಯಿಕ ಕರ್ನಾಟಕದ ಥಾಲಿಯನ್ನು | | | |
| | / Edit | | | |
| | | | | |
| | Feedback | | | |
| | Relevant O Moderately Relevant | | | |
| | Additional Resources | | | |

Shiksha Copilot Deployment

Currently partnering with **Government of Karnataka, Sikshana Foundation, Microsoft Philanthropies**

Pilot Evaluations:

Karnataka state board curriculum, English & Kannada (local language) medium, 5th to 10th grades, all subjects

- Phase 1 pilot 50+ teachers from both urban and rural schools (2023-24)
- Phase 2 pilot 1000 teachers from both urban and rural Government school across Karnataka (2024-25)
- Phase 3 Scale up to 8000 teachers across Karnataka and 1000 teachers across Telangana (ongoing)

Karnataka launches AI-powered digital assistant for teachers

In the first phase, 1,000 teachers across the State will be trained to use Shiksha Co-pilot, an AI-powered digital assistant



Bengaluru, India

muru India

than any AI can. And to me really having Siksha really be the tool



A Kaleidoscope of Projects





Responsible AI across language & cultures



Responsible AI across Languages and Cultures

WIRED

The Dire Defect of 'Multilingual' AI Content Moderation

For years, social media companies have focused their automatic content detection and removal efforts more on content in English than the world's 7,000 other languages.

Facebook left almost <u>70 percent of Italian- and Spanish-language Covid</u> <u>misinformation</u> unflagged, compared to only 29 percent of similar English-language misinformation. Leaked documents reveal that <u>Arabic</u>-language posts are regularly flagged erroneously as hate speech. Poor local language content moderation has contributed to human rights abuses, including <u>genocide in Myanmar</u>, ethnic <u>violence in</u> <u>Ethiopia</u>, and <u>election disinformation in Brazil</u>. At scale, decisions to host, demote, or take down content directly affect people's fundamental rights, particularly those of marginalized people with few other avenues to organize or speak freely. Most common approach: translate English training data to create datasets for other languages

Alternate approach: create data from scratch with native speakers for each language and culture

Can AI help scale RAI solutions with humans-in-the-loop?

Pariksha: Community Evals

AI by the People, For the People

Karya - Dignified Digital Work to enable pathways out of poverty

Digital work – OCR, translation, read and conversational speech

First experience with evaluation task

First large-scale LLM evaluation effort with this population

| ಪ್ರತಿ ಕಾಯ ಪ್ರತಿಕ್ರಿಯೆಗ ಎಚ್ಚರಿಕೆಯೆ | ರ್ುದಲ್ಲಿ ಗಳನ್ನು ಬಂದ ನೆ | , ನಿಮಗೆ ಪ್ರಾಂಪ್ಟ್ ಮತ್ತು ಎರಡು ವಿಭಿನ್ನ ತೋರಿಸಲಾಗುತ್ತದೆ. ಪ್ರತಿಕ್ರಿಯೆಗಳನ್ನು ಟೀಡಿ ಮತ್ತು ಯಾವುದು ಉತ್ತಮ ಎಂದು |
|---|------------------------------|---|
| an or | BAU | പ്പെ പ്പെ പ്രം പ്രം പ്രം പ്രം പ്രം പ്രം പ്രം പ്രം |
| ಅನುಸರಿ | ರಿಸಬಾ | ಕುದು: |
| ಪ್ರತಿಕ್ರಿಯೆ | 8 2 | |
| ರಕ್ತದೊ ಸ್ವಯವ ಸಂದೇಶ See Mo | ತ್ತಡವ ಸ್ಯ್ರವನ ವಾಗಿಗ | ನ್ನು ಕಡಿಮೆ ಮಾಡನ್ನು ನ್ನು ಹೇಗೆ ಹೆಚ್ಚು ಮಾಡುವೆಂದು ವೇ ಇದನ್ನು ಮಾಡುವಾಗ |
| ಯಾವ ಕ | ಪ್ರತಿಕ್ರಿಂ | ಯೆ ಚೆನ್ನಾಗಿದೆ? |
| D.E | 0 | ಪ್ರತಿಕ್ರಿಯೆ 1 ಉತ್ತಮವಾಗಿದೆ |
| | 0 | ಪ್ರತಿಕ್ರಿಯೆ 2 ಉತ್ತಮವಾಗಿದೆ |
| | 0 | ಇಬ್ಬರೂ ಸಮಾನರು |

Figure 1: Karya App interface for doing pairwise evaluations for Kannada. The app shows the prompt (question) along with answers from two LLMs and options for them to pick from - the first response is better, the second response is better, and tie

Samiksha: Real-world Use Case Evaluation



Community-created benchmark in multiple Indian languages Cultural nuances Specialized LLM-judges



Bringing Al-enabled earning and learning opportunities to low-income communities



Themes

- Interesting problems are everywhere
- Use-inspired (basic) research
- Malleability of AI
- Don't forget the humans
- Collaboration and partnership
- Expect surprises

Last Word



IIT Delhi Main Convocation Nov 2018 (morning)

Microsoft Research India

Microsoft

Microsoft Research

- Established in 1991
- Combination of basic & applied research
- 1000+ researchers, engineers, program managers
- Global footprint (U.S., U.K., China, India, ...)
- Impact axes: Scientific, Company, Society

We advance science and technology to benefit humanity

Microsoft Research India: Our People & Work

• Established in 2005

- Full time staff: ~60 researchers, engineers, program managers, support
 - Diverse: academia, industry, startups, IAS, ...
- Global recognition for our people & work
 - Shanti Swarup Bhatnagar Prize ('16, '19, '22)
 - Infosys Math Prize 2021
 - MacArthur Prize (2016)
 - ACM OCCW award 2020
 - SIGCHI Societal Impact Prize (2017)
 - Knuth Prize 2011
 - CAV Award (2011, 2023)
 - Fellows: 4 INAE, 5 ACM, 2 IEEE
 - 4 MIT TR35 Awards
 - TIME AI 100 (2023)
 - Forbes AI 30 (2025)
- Sizeable pool of postdocs & research fellows
 - Next stop: faculty, PhD, startup founders



AI & ML

Systems

Theory & Cryptography Tech & Empowerment

Broad Engagement with Ecosystem

Spinoffs from MSR projects

(e.g., Digital Green (agritech), Karya (data, dignified digital work), Everwell (medication adherence for TB))



New Pathways to having Impact at Scale

Goal: have benefits of our research reach max possible audience



Academic Engagement

- Goals:
 - Help grow talent pool at all levels (bachelors, masters, PhD, postdoc)
 - Foster academic collaborations in areas of mutual interest

• Programs:

...

- Academic summit
- PhD awards
- Targeted support for external events (e.g., ACM India events)

Research Fellow Program



Pre-doctoral training program

Fresh/recent graduates from the IITs, IIITs, NITs, BITS, Ashoka, ...

Outgoing fellows go to:

- Ph.D. programs: IITs, CMU, Washington, Berkeley, Stanford, Columbia, MIT, Cornell, UCSD, USC, UIUC, GaTech, U Wisconsin, UT Austin, ...
- Found startups: Ola, Capillary, Everwell, ...
- Other destinations: Microsoft, Google, Amazon, ...

We have "graduated" 400+ RFs!

Some return to MSR after PhD or elsewhere at Microsoft

Other notable alumni

- Bhavish Aggarwal (CEO of Ola)
- Krishna Mehra (founded Capillary)
- Andrew Cross (CEO of Everwell)
- Manu Chopra (CEO of Karya)
- Uday Singh Pawar (Bollywood Director)
- Vidhya Y (co-founded Vision Empower Trust)