

# Ramneek Kaur

PhD, IIIT-Delhi (India)

Post doctoral Fellow, IIT Delhi

## About me

I'm a Computer Science researcher working at the intersection of AI and Geospatial analytics for environmental applications. My current research focuses on climate resilience in the agricultural sector, targeted towards building water security in rural India.

## Current employment

I am working as a postdoctoral fellow with the [ACT4D](#) (Appropriate Computing Technologies for Development) research group at IIT Delhi, mentored by [Prof. Aaditeshwar Seth](#), where I have been working since April, 2023, on using data and technology to strengthen rural livelihoods.

My postdoctoral research focuses on the impact evaluation of Natural Resource Management (NRM) interventions, particularly the construction and maintenance of water harvesting structures (e.g., farm ponds and check dams), and waterbody rejuvenation efforts in rural areas. My work leverages satellite imagery and computational methods to evaluate the effectiveness of these interventions in enhancing agricultural productivity and drought resilience, and to perform site suitability analysis, for the broader aim of informing strategies for sustainable agricultural practices, in the face of climate change.

Prior to this, I completed my Ph.D. from IIIT-Delhi in 2022, where my research focused on developing navigation and task allocation algorithms to promote sustainability in urban transportation systems.

My broader research interests lie in the use of ICT for development, with a focus on leveraging computational methods to drive sustainability and equity in both rural and urban contexts.

## Research expertise

ML/AI for climate adaptation in the agricultural sector, Remote-sensing data for climate resilience (Google Earth Engine, QGIS), Causal inference (Difference-in -Differences, Double ML), Geospatial analytics, Route planning for road networks, Task assignment in Spatial crowdsourcing (platforms such as taxi-hailing services, online-to-offline food ordering and delivery services, etc.).

## Education

- Ph.D. (June 2016-September 2022) (**8.71/10.00**)
  - Dept. of Computer Science & Engineering, Indraprastha Institute of Information Technology-Delhi (IIIT-Delhi), New-Delhi, India
- Master of Technology (2013-2015) (**8.46/10.00**)
  - Dept. of Computer Science & Engineering, Akal College of Engineering & Technology, Eternal University, H.P., India
  - Dissertation: An Intelligent Framework for Agricultural Land Suitability Evaluation
- Bachelor of Technology (2009-2013) (**9.67/10.00**)
  - Dept. of Computer Science & Engineering, Akal College of Engineering & Technology, Eternal University, H.P., India

**Ph.D. Thesis:** ‘Investigating computational techniques for micro-level and macro-level transportation problems on urban road networks’, mentored by Prof. Vikram Goyal and Prof. Venkata M. V. Gunturi

My thesis aims to address challenges related to navigation on urban road networks, with a focus on route planning in developing nations, where the road-network infrastructure may be compromised, and also develop scalable solutions for spatial crowdsourcing based applications such as taxi-hailing service, online-to-offline food ordering and delivery services, rescue operations, etc.

### Published works

1. **Kaur, R.**, Goyal, V., Gunturi, V.M.V. (2018) **Finding the Most Navigable Path in Road Networks**: A Summary of Results. In: Database and Expert Systems Applications. DEXA 2018. Lecture Notes in Computer Science, vol 11029, pp. 440–456. Springer, Cham.
2. Gupta, V., Kaur Jolly, B.L., **Kaur, R.**, Chakraborty, T., (2019) Clark Kent at SemEval-2019 task 4: Stylometric insights into hyperpartisan news detection, in: Proceedings of the 13th International Workshop on Semantic Evaluation, Association for Computational Linguistics. Pp. 934–938.
3. **Kaur, R.**, Goyal, V. & Gunturi, V. M. V. (2021) Finding the most navigable path in road networks. *Geoinformatica* 25, 207–240. <https://doi.org/10.1007/s10707-020-00428-5>
4. **R. Kaur** et al., "A Navigation System for Safe Routing," (2021) 22nd IEEE International Conference on Mobile Data Management (MDM), 2021, pp. 240-243, doi: 10.1109/MDM52706.2021.00047
5. **Kaur, R.**, Goyal, V., Gunturi, V. M. V. and Long, C., (2022) A Matching Based Spatial Crowdsourcing Framework for Egalitarian Task Assignment, 23rd IEEE International Conference on Mobile Data Management
6. **Kaur, R.**, Bansal, K., Garg, D., Sardana, R., Vishnubhatla, S., Aggarwal, S., Kumari, S., Singla, P., Seth, A., Assessing the impact of farm ponds on agricultural productivity in Northern India, ACM COMPASS 2024, New Delhi, India, July 8 - 11, 2024

### Manuscripts in preparation

1. **Kaur, R.**, Kapoor, S., Murarka, A., Verma, A., Prasad, P., Seth, A., Assessing the Differential Impacts of Farm Ponds on Agricultural Landscapes in India: A Causal Inference and Remote Sensing-based Approach. Manuscript in advanced preparation for submission to World Development.
2. **Kaur, R.**, Coauthors. Evaluating the Heterogeneous Impacts of Farm Ponds at the Agro-ecological Zone Level in India. Manuscript in preparation.
3. **Kaur, R.**, Coauthors. A Toolkit for Impact Evaluation of Farm Ponds and Check Dams using Remote-sensing data. Manuscript in preparation.
4. First author, Second author, **Kaur, R.**, et al. Data-driven Modelling for Landscape-level Impact Prediction of NRM Interventions. Manuscript in preparation. (Substantial contribution to methodology and analysis)

### Works in progress

1. **Kaur, R.**, Coauthors. Impact Monitoring of Waterbody Rejuvenation Works in India. Work in progress.

### Work experience

- **Post Doctoral Fellow**, ACT4D research group, CSE department, IIT Delhi (April 2023 - present date)

- **Intern** at Air India Limited (August 2012 - November 2012)
  - Project: Cargo Information application development based on the Swings Framework
- **Intern** at Engineers India Limited (June 2011- July 2011)
  - Project: Construction of portal for construction work based on documentum
- **Manager, School Innovation Projects** for The Kalgidhar Society, an International NGO working towards rural education, women empowerment, drug and alcohol de-addiction, and social welfare relief and rehabilitation, among other initiatives

## Teaching Experience

- **‘Introduction to Computer Science’** with Introduction to Computer Science COL100 at IIT Delhi, 2024 (Co-taught with Prof. Kumar Madhukar, Dr. Mahesh Sreekumar Rajasree and Dr. Prasad Chaugule)
- **Teaching assistant** at IIIT-D for undergraduate level courses on Introduction to Programming, Algorithm Design and Analysis, Database Management Systems, Theory of Computation, Data Mining and Big Data Analytics
  - Duties: Lecturing in tutorial sections, leading lab sections, grading and guiding students, designing programming assignments

## Invited talks

- **‘Waterbody Rejuvenation - Decision Support and Impact Assessment’**, Landscape Solvability Workshop Edition 2, ANSK School of IT, IIT Delhi, 15 Dec, 2025
- **‘Paper discussion - Shallow Gains, Deep Losses: The Limits of Uniform Groundwater Regulation’**, Workshop on Economics of Groundwater and Irrigation in Asia, IIIT Delhi, October 7, 2025
- **‘AI/ML for Climate Adaptation and Sustainable Resource Management’**, Short term training program on AI and ML, Faculty of Computer Engineering, Jamia Millia Islamia, 11 July, 2025
- **‘Impact Assessment of Farm Ponds in North India’**, Monitoring, Evaluation and Learning (MEL) Roundtable, organised by **WELL Labs**, 16 September, 2024, New Delhi
- Lecture on **‘Causal Inference for Climate Resilience’**, in the course on 'Ethics in Computer Science' offered by Prof. Aaditeswar Seth in the Winter 2024 semester at IIT Delhi
- **‘Commoning for Resilience and Equality (CoRE) stack’** at India SGC (Sustainable Geocommunities) Event, IIT Kanpur Outreach Center, Noida, 25 June, 2024
- **‘Commoning for Resilience and Equality (CoRE) stack’** at Data stewardship for climate change through AI held at IIT Bombay, India on March 19-20 '24, organised by FCDO, UK

## Conferences talks and tutorials

- Talk on ‘Assessing the impact of farm ponds on agricultural productivity in Northern India’ at **ACM COMPASS 2024**, New Delhi, July 8-11
- Talk on ‘Impact assessment of farm ponds on agricultural productivity’ at **GeoSmart India 2023**, Hyderabad, India, October 16-19 '23, organised by Geospatial World
- Online talk on ‘A Matching Based Spatial Crowdsourcing Framework for Egalitarian Task Assignment’ at the 23<sup>rd</sup> IEEE International Conference on **Mobile Data Management** held in Paphos, Cyprus on June 06-09, 2022

- Online talk on ‘A Navigation System for Safe Routing’ at the 22<sup>nd</sup> IEEE International Conference on **Mobile Data Management**, Toronto, Canada , June 15-18, 2021
- In-person talk on ‘Finding the most navigable path in road networks’ at the 29<sup>th</sup> Intl. Conference on **Database and Expert Systems Applications**, The University of Regensburg, Germany, September 3–6, 2018
- Informal talk on ‘Route planning for road networks’ as part of the **PhD ketchup talk series** at IIIT-Delhi on 28 August, 2018
- Programming tutorial on ‘Parallel computing using PySpark’ at the **Summer school on AI-Assisted Data Analytics**, IIIT-Delhi, 11-14 July, 2019

### Participation in conferences and forums

- Stakeholder Consultation Workshop on **Designing Inclusive and Scalable Digital Advisory Framework for Climate Resilience**, New Delhi, 4-5 November 2025, organised by **IRRI, CGIAR**
- **CivicSabha**, New Delhi, November 6-7 '23, organised by the CivicDataLab
- ACM India Grad Cohort Workshop, IIT Bombay on 6-7 July, 2018, organised by ACM-W
- Very Large Databases (VLDB), New Delhi, 5-9 September, 2016
- Women Entrepreneurship Conference, New Delhi, 17 March, 2016, organised by Delhi Management Association
- Women Economic Forum, New Delhi, 16-21 May, 2016, organised by the All Ladies League
- Global Indian Business Conference, New Delhi , 10 January, 2014, organized by FICCI

### Academic achievements and distinctions (in chronological order)

1. Recipient of the **Dean’s list award for Innovation in R&D** for the work 'Stylometric insights into hyperpartisan news detection', awarded on the foundation day of IIIT-Delhi in 2019
2. Recipient of the prestigious **Visvesaraya Ph.D. fellowship** by the Ministry of Electronics and IT, Govt. of India during PhD
3. Qualified the All India Graduate Aptitude Test in Engineering Exam (**GATE**) – 2016 with **98.8 percentile**
4. Awardee of **university gold medal** for standing first in Eternal University in B.Tech.
5. Awardee of **university gold medal** for being the ‘**Best All Round Graduate across all disciplines**’ among 817 students of graduating batch of 2013 of Eternal University, for exemplary performance in academics, co-curricular activities and community work
6. **All India topper** in mathematics in CBSE secondary board examination

### Community engagement

- Went on a field visit to some villages in Sirohi district, Rajasthan, India on May 9 -10 '23, with the objective to understand the GIS based planning done in the rural villages for prospective NRM interventions, as a post-doctoral fellow at IIT Delhi
- Developed a patient management portal based on Java Server Pages for the Physiotherapy Dept. of Akal Charitable Hospital during B.Tech.

- Undertook the following projects as **Manager, School Innovation Projects** for The Kalgidhar Society - part-time voluntary service done while pursuing M.Tech., during academic sessions 2013-'14 and 2014-'15:
  1. Professional development of 3000 K-12 teachers and 110 school principals through a series of 150 workshops delivered by eminent resource persons/authors from leading publishing houses
  2. Implementation of the 'Cambridge Secondary 1' curriculum at Akal Academy, Baru Sahib through a teachers' training programme
  3. Pilot project for pedagogical training of primary level teachers and principals of 33 schools, in collaboration with XSEED Education
  4. Students' audit project for assessment of thinking and problem solving skills of primary level students in 77 schools, in collaboration with Scholastic India Pvt. Ltd.

## References

1. Prof. Aaditeshwar Seth, Professor, School of IT, IIT Delhi ([aseth@cse.iitd.ac.in](mailto:aseth@cse.iitd.ac.in))
2. Prof. Vikram Goyal, Professor, Dept. of CSE, Indraprastha Institute of Information Technology-Delhi ([vikram@iiitd.ac.in](mailto:vikram@iiitd.ac.in))
3. Prof. Venkata M. V. Gunturi, Assistant Professor, University of Hull, UK ([gunturi@iitrpr.ac.in](mailto:gunturi@iitrpr.ac.in))
4. Dr. Davinder Singh, Secretary, The Kalgidhar Society ([secretarykts@barusahib.org](mailto:secretarykts@barusahib.org))
5. Dr. Neelam Kaur, Advisor, Health & Education, The Kalgidhar Society ([admin@akalacademy.in](mailto:admin@akalacademy.in))