Bhartendu Pandey

Alvin M. Weinberg Fellow

Where and when did you earn your PhD?

I got my PhD in 2021 from the Yale School of the Environment.

What was the subject of your dissertation?

My doctoral dissertation research focused on measuring and forecasting urban infrastructure distributions, as well as assessing their human health impacts while also contemplating broader implications for global sustainable development.

What was your dissertation's major contribution to your field?

My dissertation research developed novel empirical approaches to study urban infrastructure distributions at scale, using detailed satellite remote sensing and census datasets. Using these approaches, my doctoral research emphasized how these distributions are intertwined with urbanization—and are a challenge to urban sustainability as well as global sustainable development—and highlighted the human health benefits and disbenefits of changes in infrastructure distributions.

Who is your ORNL mentor and which group and division are you working in?

My primary ORNL mentor is Supriya Chinthavali, group leader for the Critical Infrastructure Resilience Group in the Geospatial Science and Human Security Division (GSHSD). Within GSHSD, I also receive mentorship from Dalton Lunga, GeoAI Group leader. Beyond GSHSD, my mentoring panel include David McCollum (Buildings and Transportation Science Division), Colleen Iversen (Environmental Sciences Division), and Forrest Hoffman (Computational Sciences and Engineering Division), which offers a unique opportunity for my research to engage with multiple ideas and perspectives.

What will your fellowship research focus on?

My fellowship research will focus on advancing the science and decision-making capabilities towards urban transitions under constraints with a goal to transform our ability to advance human well-being, considering transformative potential of urban areas.

What is your project's expected contribution to your field?

My project is expected to deliver a novel understanding of generalizable aspects of infrastructure distributions including boundary conditions, dimension-specific constraints, and future expectations, all of which are necessary to inform future urban transitions.

What are your research interests?

My research interests are in urbanization and global environmental changes, remote sensing, geographic information, and complex systems sciences, and artificial intelligence.

What led you to science and your specific discipline?

I am keen on discovering pathways that can simultaneously advance human and planetary well-being, and a firm believer in science bringing a transformative impact. Ongoing social processes offer significant opportunities but can be challenging to leverage especially with limited scientific understanding. With my research expertise, I seek to elucidate the nature of opportunities underlying urbanization as well as limiting constraints.

What did you do before coming to ORNL?

Assuming the role of a lead urban data scientist, I served the Urban Nexus Lab at the Department of Civil and Environmental Engineering and the M.S. Chadha Center for Global India, both housed at Princeton University.

Could you share an interesting fact or two about yourself?

Coming from northern India, I have a penchant for (vegetarian) street food, which I indeed miss in the United States. But, over the years I have spent here, I have discovered several hidden gems—just scattered across the country.

What nonscience topic or activity is important to you and why?

Besides spending time with my wife and son (a recent addition), I love to explore, and play on my guitar, diverse forms of contemporary music—from Trio Da Kali to Taylor Swift, from Johnny Cash to Slayer, from Indian classical to Indian folk metal. I find spending time with family and music very inspiring.

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