

CASE STUDY  
Z BY HP AMBASSADOR

## PARAS VARSHNEY: INQUISITIVE NATURE FINDS FERTILE GROUND IN DATA SCIENCE

Unprecedented levels of achievement, problem-solving made possible  
with Z by HP



Z8



Paras Varshney's parents had a challenge on their hands. Little Paras was forever taking household appliances apart to find out what was inside and how they worked. At least he would re-build them, and they grew to understand that these dissections were influencing their child's future.

At school, math and physics were Varshney's fortés, and he earned a bachelor's degree in

Computer Science from the Indian Institute of Information Technology. It was here that he first heard about machine learning/AI and data science. Varshney explains, "Suddenly, it seemed I was hearing about machine learning everywhere. The idea that you didn't need to code; that a machine could learn by itself was just absolutely fascinating and thrilling to me."

## AT A GLANCE

### PARAS VARSHNEY, BENGALURU, INDIA

- Data Scientist at IUDX, Society for Innovation and Development, IISc. Bengaluru
- Bachelor's degree in Computer Science from the Indian Institute of Information Technology
- Kaggle highest world ranking of 68 out of 138,000+ data scientists
- Kaggle Master and 3X Expert
- Teaches programming skills to junior coders
- Author for Towards Data Science
- Loves playing guitar and drums, table tennis, and speedcubing



As a Z by HP Global Data Science Ambassador, Paras Varshney's content is sponsored and he was provided with HP products.

Inspired, he turned to YouTube and some MOOCs (massive open online courses) and began teaching himself about machine learning and data science and found they were the perfect complements to his school coursework.

Today, Varshney is a Data Scientist at IUDX Programme Unit, Society for Innovation and Development, IISc Bengaluru, where he works on data analytics and R&D behind

products to help both consumers and the government improve quality of life."

During the first COVID-19 lockdown, Varshney joined Kaggle, the world's largest online data science community, to explore how other data scientists are working to solve problems. He says, "I started participating in discussions, then developing notebooks, and then competing." Varshney is recognized within the top one percent

**"EVEN THOUGH I STARTED THE COMPETITION LATE, THE Z BY HP SOLUTIONS GAVE ME THE ABILITY TO EXPERIMENT WITH A LOT OF POTENTIAL IDEAS AND TRAINING WAS VERY SMOOTH. IN FACT, ON KAGGLE THE TRAINING TASK TOOK SIX TO SEVEN HOURS BUT ON THE Z8 WORKSTATION, I DID IT IN LESS THAN FOUR HOURS. THIS EXTRA TIME GAVE ME THE OPPORTUNITY TO TRY OUT OTHER APPROACHES— SOMETHING I WOULD NOT HAVE BEEN ABLE TO DO WITH KAGGLE KERNELS."**

Paras Varshney, Z by HP & NVIDIA® Data Science Global Ambassador

an open-source data exchange platform for smart cities. He says, "At IUDX, we are ingesting and analyzing streaming data with high throughput coming from transportation systems, air quality sensors, flood sensors, weather stations, pollution sensors and waste management, and a lot of sensors based locally in smart cities in India. This information will then be used to build

of Kagglers worldwide and has achieved a Master tier as well as three Expert tiers.

In addition, Varshney enjoys writing and has been published on the highly respected online platform Towards Data Science. He also shares his passion for learning by teaching junior students above the 6th standard programming skills through an online collaborative-based classroom he



## SOLUTION HIGHLIGHTS:

### HP Z8 G4 1125W PSU

- Dual Gold Intel® Xeon® 6234 3.3 GHz 8C - CPU
- NVIDIA® RTX 8000 - GPU
- 96GB (6x16 GB)
- Ubuntu 20.04
- Z by HP Data Science Software Stack

### Z38C DISPLAY

- 37.5-inch diagonal curve
- 3840 X 1600 at 60 Hz resolution

### HP ZBOOK STUDIO G7

- Approx: 4 lbs/2 Kilos
- i9 – 10885H processor
- 32GB RAM
- NVIDIA® RTX 5000 (16 GB VRAM)
- 15.6-inch display
- Ubuntu 20.04
- Z by HP Data Science Software Stack

## PRE-LOADED, POPULAR DATA SCIENCE TOOLS, TURN-KEY & READY OUT OF THE BOX:

Z by HP Data Science Software Stack

Learn more:

Z by HP Data Science Brochure

established. He says, “I have about 15 students doing Python-based projects and learning the art of programming computers. I love teaching every weekend.” He also loves to travel, play table tennis, and is a speedcuber: solving a Rubik’s Cube phenomenally fast. Varshney says, “I’m not a pro, but I can solve it in under 30-40 seconds.”

### Power and speed fuel curiosity

As data science takes on an increasingly important role, the curiosity of data scientists like Varshney is critical. Data alone is not valuable—it is the insights that come from analyzing and interpreting it that are true gold. Curiosity impels scientists to examine data to probe for all possible patterns and implications in an unbiased way. With tools that help them do this faster, they now have the freedom and power to delve deeper and look further. As a Z by HP & NVIDIA® Data Science Global Ambassador, Varshney uses both the HP Z8 G4 Tower Workstation with an HP Z38c LED monitor, and the HP ZBook Studio Mobile Workstation for work and on Kaggle.

He utilizes the Z8 workstation to train models, something he says just isn’t possible on the computer he has at work. He credits this to the fact that the Z8 was purpose-built for power-intensive workloads, citing that the GPUs have more than 5,000 CUDA cores. Multiple cores allow Z by HP to perform numerous tasks simultaneously and do it much faster. He says, “I can train for 8-12 hours non-stop and there is never a lag. The Z8 GPUs can handle huge data sets and do it quickly. Training models with a 16GB GPU



“THE ZBOOK IS A MIRROR OF THE Z8, SAME POWER AND PERFORMANCE, JUST IN A SMALL, SLEEK, PORTABLE SIZE. I CAN TRAIN MODELS ON THE ZBOOK JUST AS WELL AS THE Z8 WORKSTATION.”

Paras Varshney, Z by HP & NVIDIA® Data Science Global Ambassador



like Kaggle offers takes 12-plus hours; the Z8 cuts that time to eight hours. I can literally work as much as I want to.”

Varshney says that the preloaded software stack provides everything a data scientist needs, already loaded and ready to go. He explains, “There is no need to install anything or deal with version updates. The right tools for analyzing data and creating powerful

models are all there, tested, preloaded, and ready to work.”

#### **Z by HP in action**

He used the Z8 on a Kaggle competition for Cassava Leaf Disease Classification. Cassava is a starchy root vegetable and a major source of calories and carbs for people in developing countries. Varshney’s project examined images

of cassava leaves to identify if they were diseased. His submission ranked 7th globally on the public leaderboard. He says, “I ran the project and built the competition pipeline on the HP Z8 workstation, training models for seven or eight hours a day. My work would not have been possible without the Z8.”

For another Kaggle competition, the Shopee Price Match Guarantee, his team

won a silver medal and placed 26 out of 2,426 teams. Varshney explains, “It would not have been possible without my powerful Z8 workstation powered by NVIDIA Quadro RTX 8000, which enabled me to train all the different models and build the pipelines smoothly and efficiently.”

Of the less-than-four-pound, 17.5mm thin HP ZBook Studio, Varshney says, “The



## KAGGLE: LEARN, COMPETE, CHANGE THE WORLD

- Over 6 million registered Kagglers solve data science problems, gain access to powerful tools and resources, and compete for prizes.
- There are five tiers: Novice, Contributor, Expert, Master, and Grandmaster. Currently, there are 211 Grandmasters.
- Kaggle has run hundreds of competitions, from improving gesture recognition to improving the search for the Higgs boson at CERN. Competitions have resulted in successful projects including furthering HIV research and traffic forecasting. The learnings that result from the competitions and shared on Kaggle are being transferred into enterprise workflows to transform how business works.

Visit [www.kaggle.com](http://www.kaggle.com) to learn more.

ZBook is a mirror of the Z8, same power and performance, just in a small, sleek, portable size. I can train models on the ZBook just as well as the Z8 workstation.” He mentions the NVIDIA Quadro RTX™ Graphics, saying it makes it easy to render, design, and multi-task, effortlessly.

He says that his work is all about using data to create insights that will address the complex issues facing Indian cities and to improve urban life over the long-term. Because of this, there are many huge data sets and a very fast in-flow of data, but the Z8 and the ZBook never falter. He says, “All the libraries and software that I need for work are already installed, and the Z by HP solutions handle whatever I throw at them.”

Varshney used the Z by HP solutions to develop a prediction model for the 2021 NCAA March Madness tournament—where he won a solo bronze medal. He says, “Even though I started the competition late, the Z by HP solutions gave me the ability to experiment with a lot of potential ideas and training was very smooth. In fact, on Kaggle the training task took six to seven hours but on the Z8 workstation, I did it in less than four hours. This extra time gave me the opportunity to try out other approaches—something I would not have been able to do with Kaggle Kernels.” He adds that the 50GB of NVIDIA memory on the Z8 accommodated intense training for all his models

which in turn helped him achieve a better score and boosted his overall performance.

### Protecting and enabling the future

As machine learning evolves and moves beyond simply predicting what may happen next, to actually learning and doing without human intervention, we will see more and more functions become automated. Varshney points to robotics in assembly lines and stock predictions as just two ways this is already manifesting. He says, “Machine learning and the automation that is possible because of it have applications across industries. There is enormous potential for improvement everywhere you look.”

With his country in the midst of a devastating second COVID-19 wave, he says that data science is making an impact. “A year ago, we had zero data about COVID. Now, we have massive amounts. Some data scientists at a university here in India predicted this second wave, and it’s happening exactly as they said, with a very fast and high peak,” he explains. In the future, data science and machine learning will enable us to address potential outbreaks before they get out of control, stimulate vaccine development proactively, and adjust health system capacity automatically. Data science will help keep the next generation of young tinkerers and future scientists healthy and safe.

### THE POWER OF Z:

Train models in half the time

Pre-loaded data science tools for immediate productivity

Power and performance of Z8 in sleek, > four-pound, 17.5mm thin HP ZBook Studio

Easy rendering, designing, and multi-tasking with NVIDIA® Quadro RTX™ Graphics

Install any libraries or software



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