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Weekend

A PART OF OUR EVERYDAY LIFE

Anirudh Sharma, Tanveer Ahmed and Rahul Rawat

Give them some space

They're working on a sort of "Google Maps" for Low-Earth Orbit. Their first tracker is now in space. They aim to add more, to generate live maps of this crowded and hazardous zone. The maps will plot every satellite, all the old debris, even bits of orbiting junk as tiny as 5 cm in size. This could make LEO safer, they say. Oh, and the three men are 26 years old

Anesha George
anesha.george@hindustantimes.com

They spent their childhoods gazing up at the sky. Now they have a satellite out there, doing some of that for them.

Anirudh Sharma grew up in Bengaluru, the son of a DRDO (Defence Research and Development Organisation) technical officer, captivated by the air shows his father took him to.

Tanveer Ahmed, also in Bengaluru (they were classmates, in fact), told anyone who asked that he was going to be a fighter pilot when he grew up.

Hundreds of kilometres away, in the foothills of the Himalayas, Rahul Rawat marvelled at the star-studded skies over Pauri Garhwal, Uttarakhand.

All this was just a few years ago. The three men are only 26. But their space-tech start-up Digantara (Sanskrit for Distant Land), recently launched the world's first commercial space-based space surveillance satellite, named Space Camera for Object Tracking, or SCOT.

The 25-kg contraption (slightly larger than a shoebox) will essentially scan the skies and map debris as small as 5 cm, in Low-Earth Orbit, providing maps and data, for a fee, to

clients from among the growing number of government agencies and private companies operating satellites, labs, research vessels and potentially tourist operations off-planet.

Their SCOT left Earth aboard SpaceX's Transporter-12 in January. It is currently in orbit, and relayed its first images on March 8.

Digantara shot into the limelight with an exuberant tweet that day: "Space just ran out of hiding spots."

Behind the scenes, it had been a long, nail-biting journey. In the hours after the launch, each orbital pass saw stress levels balloon, until they received the ping that told them the satellite was alive and well.

"I don't really think I slept for a good 48 hours before we got our first signal," says chief technical officer Ahmed, laughing.

"Receiving the images was a huge culmination of all our hard work," adds chief executive officer Sharma. "This is a giant leap."

Think of it like air-traffic control, for space. So far, most situational assessments of planet have been carried out using ground-based systems.

ISRO, for instance, uses NETRA (the Network for Space Object Tracking and Analysis) to keep an eye on objects that might be approaching Indian space assets, with a view to keeping those assets safe.

Most satellites and orbiters are in fact designed for a certain amount of redundancy, with the understanding that parts will be struck, and need backups or repairs.

But with rockets now being reused and traffic set to grow, the men behind Digantara decided to use their skills in computer-science and aerospace engineering to meet a niche need. Digantara essentially aims to create "a Google Maps for Near-Earth Objects", enabling a greater degree of protection, in an environment where speeds exceed 14 km per second.

How much debris are we talking about? According to the European Space Agency (ESA), over 39,000 space objects are now tracked by surveillance networks, of which 11,000 are payloads. An estimated 40,500 pieces of debris are larger than 10 cm. Objects larger than 1 cm number over a million.

Incidentally, the three men know what it's like to lose something to a direct hit.

In 2018, a piece of space debris crashed into a satellite they helped build. "Its loss highlighted the need for space-situational awareness," says Ahmed.

They were 19 and still in college when they joined hands to land that international consultancy project. They were still 19 when they registered Digantara as a company, to "claim an invoice that would eventually become our seed capital", Sharma says.

Today, it is a huge relief, they say, to have met their goal of being first in the air, "at a time when space tech is in rapid development around the world," as Sharma puts it.

They have seen their company raise \$14.5 million in funding, over five years.

"Our mantra has been to celebrate failure and fall fast," Sharma says. "We've made mistakes, learned along the way, built the right technology at the right time. I'd say that's the lesson: Fail early and learn fast."

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WATCH clips from inside the Digantara lab, and the nail-biting launch day

1 This wasn't the original dream for any of the three men. Anirudh Sharma and Tanveer Ahmed of Bengaluru, and Rahul Rawat of Pauri Garhwal in Uttarakhand, started out chasing the dreams of a life in the US, or a career as a fighter pilot.

2 They ended up studying computer-science and aerospace engineering, and began to collaborate while in college. They registered their start-up, Digantara, when they were still 19. "We registered it so we could claim an invoice, which ended up being our seed capital," says Sharma, CEO.

3 The company has since grown to 100 employees, testing and production facilities, a growing list of investors – and a first-of-its-kind eye in the sky. "We've made mistakes, learned along the way, but built the right technology at the right time. I'd say that's the lesson: Fail early and learn fast," Sharma says.