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Mumbai firm empowering self-driving cars in US with high-precision HD mapping

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NEW DELHI: Although self-driving cars remain a distant reality for the Indian roads, a Mumbai-headquartered firm has become the first desi company to develop high-precision HD maps for a customer in the United States which is at the forefront of autonomous vehicle technology.

Established in 1995, Genesys International Corporation Ltd has completed an extensive HD mapping of road and street network for an autonomous driving project in North America that will enable residents to access self-driving taxis at their doorstep.

Core to the autonomous vehicle technology, HD self-navigation maps enable, aid and guide autonomous cars to self-drive and navigate.

The HD map has high-precision navigational geometry and 360-degree panoramic imagery leading to a unique "fingerprint" of every stretch of the road.

"We cannot disclose the customer name as we are bound by non-disclosure. Through our technical expertise, we were able to support our customer to quickly verify the assumptions on large-scale areas," Kuldeep Moholkar, CEO-Designate, Genesys International Corporation Ltd, told IANS.

"Once we completed initial data deliveries, we were able to scale up to the customer's requirements. This has now given us the confidence to undertake HD map creation for a large volume of work involving counties, states and even entire countries," Moholkar emphasised.

The HD maps are created from Light Detection and Ranging (LiDAR) source data which consists of billions of pixels -- commonly referred to as a point Cloud.

These billions of data points are curated to extract the features to create a machine-readable image of the road as well as the entire surrounding environment.

LiDAR sensors calculate how far a given object is, by measuring how long it takes for a pulse of infrared laser light to reach a car and bounce back.

Currently, Google' Waymo and global cab-hailing service Uber rely on the LiDAR technology but not Elon Musk's Tesla that uses high-end computer vision technology via cameras.

HD maps aid the autonomous vehicle in real-time decision-making capability, by localising the earth spatially and letting the vehicle know the position of its exact location, thus guiding the vehicle to align to the road, when to drive, where to head and when to stop.

The HD map content is currently being rigorously tested on autonomous cars for real-world readiness and large-scale deployment. Once successfully passed, the autonomous car fleet will start using the HD maps data for self-navigation within the community in the US," Moholkar explained.

Genesys has nearly 2,000 professionals with expertise in Geographical Information System (GIS) and Geospatial Engineering domain.

The company is working in the fields of remote sensing, LiDAR, aerial survey, photogrammetry and GIS-based e-governance solutions.

Based in the financial capital, Genesys also operates production and software development centres in Dehradun and Jaipur.

"We are in discussions with auto-makers, original equipment manufacturers (OEMs) and various product/services companies in the autonomous vehicle eco-system to partner and provide value-based services.

"We are also close to signing a formal MoU with another technology company for supporting their autonomous vehicle initiative. We will talk about that subsequently," Moholkar told IANS.

Considering the existing infrastructure, driving culture and the breadth of our geography, lamented Moholkar, the idea of an autonomous vehicle being fully functional on the Indian roads looks a little distance away at the moment.

"Having said so, Genesys and many Indian technology companies are investing heavily to build competence in this space via LiDAR technology, deep learning and Machine Learning (ML)," the Genesys executive said.

Hundreds of technology startups are currently engaged in creating products and services related to autonomous vehicles in the country.

"The resultant technology stack can be potentially used to build and implement our very own indigenous autonomous cars which will operate within a small geographical area such as corporate campuses, universities, airport lounges and large industrial premises, etc," Moholkar noted.