



IIT Hyderabad, Department of Posts, and NRSC (ISRO) Collaborate to Launch DIGIPIN: A National-Scale Geospatial Addressing System for India

Highlights:

- **Compactness:** Short and efficient codes for ease of use.
- **Geographic Precision:** Ability to extract exact latitude and longitude coordinates.
- **Inclusivity:** Coverage for all parts of India, including densely populated and remote regions.
- **Privacy:** DIGIPIN carries no personal information.
- **Future-readiness:** Scalable and adaptable for future needs.

Hyderabad, 30th June, 2025: In a landmark move to revolutionize India's addressing infrastructure, the Indian Institute of Technology Hyderabad (IITH), in collaboration with the Department of Posts and the National Remote Sensing Centre (NRSC), ISRO, Government of India, has developed DIGIPIN – an open-source, machine-interpretable geospatial addressing system designed to provide precise and standardised digital addresses across the country.

Traditional descriptive addresses in India suffer from a lack of uniformity and machine-readability, causing inefficiencies in postal and logistics operations. DIGIPIN aims to transform this system by introducing a geo-coded, digital public infrastructure (DPI) layer for India's physical addressing landscape.

DIGIPIN is a compact, intuitive, and human-readable geohash, capable of encoding the latitude and longitude of any point of interest in India, from urban households to remote maritime locations. The system is designed for offline usability, privacy, and robustness, making it suitable for diverse applications including e-commerce, emergency response, and public service delivery.

DIGIPIN is the outcome of a dedicated research effort by a team of faculty from the Department of Electrical Engineering at IIT Hyderabad, Dr Shashank Vatedka, Prof Soumya Jana and Dr Lakshmi Prasad Natarajan, along with Tarandeep Singh, a former MTech (AI) student. Their work has produced a geohashing scheme that encapsulates geographic coordinates into short, intuitive codes, which can be extracted even offline using location-enabled devices.

Prof. B S Murty, Director of IITH, expressed pride in the achievement, stating, “DIGIPIN represents a leap towards the vision of a digitally empowered India. By converting every location into a simple, verifiable, and interoperable digital code, we are laying the foundation for an address infrastructure that can scale with our nation's growing technological and societal needs. IITH is proud to contribute to this national initiative that blends open-source innovation, geospatial intelligence, and public service and this can be considered a revolution in the field of Navigation.”

Dr. Shashank Vatedka, Assistant Professor, Department of Electrical Engineering, IITH, mentioned that, “DIGIPIN will provide immense convenience to Indian residents and all stakeholders by succinctly and precisely representing a physical address. For instance, it could be represented as a QR code or a barcode and printed on consignments for machine-based routing; DIGIPIN could be easily stored and communicated using digital wallets.

Dr. Lakshmi Prasad Natarajan, Associate Professor, Department of Electrical Engineering, IITH, mentioned that, *“The idea was to make it as easy as possible to automatically assign codes and start using DIGIPIN with as little manual intervention as possible. In many cases, finding one’s DIGIPIN would be possible using only a device with a reasonably good location service (such as a smartphone) and an app equipped with a high-resolution map.”*

Dr. Soumya Jana, Professor, Department of Electrical Engineering, IITH, mentioned that *“The applicability of DIGIPIN could be wider, going beyond the primary use as a digitization technology for conventional addressing. They could be used in scenarios where conventional addresses are inconsistent or not available, such as emergency response services, locating public service centres/utilities such as Health camps, Aadhar enrollment offices, and so on.”*

DIGIPIN is a geohashing scheme designed to have the following features:

- The length of the DIGIPIN is designed to be as small as possible in order to provide an efficient digital representation of addresses.
- It contains the geographic location of the address. It is possible to extract the latitude and longitude of the address from the DIGIPIN with low complexity. This can also be done offline.
- All points of interest to India (including maritime regions) are assigned DIGIPIN, and it is possible to assign a unique DIGIPIN to very densely populated areas.
- The format of the DIGIPIN is intuitive and human-readable. An effort was made to infuse a sense of directionality within the format of DIGIPIN.
- Ease of code assignment and usability: A crucial point of consideration was to make it as easy as possible to automatically assign codes and start using DIGIPIN with as little manual intervention as possible. In many cases, finding one’s DIGIPIN would be possible using only a device with a reasonably good location service (such as a smartphone) and an app equipped with a high-resolution map.
- DIGIPIN only encodes geographical information and contains no personal details that could lead to privacy violations.
- DIGIPIN is designed to be robust to future developments and changes.

About IIT Hyderabad:

IITH, established in 2008, has reached a respectable position in Academics, Research, Technology development and Startups in a short span of 16 years. In the National Institutional Ranking Framework (NIRF), IITH has bagged at 3rd in Innovation and 8th among Engineering institutes in the last two consecutive years, while it has maintained its rank within the top 10 Engineering Institutes ever since NIRF was launched. IITH is ranked 664 in QS World University Ranking-2026 and among the top 10 Engineering Institutes in India in the QS ranking. IITH has been striving for excellence with a motto of "Inventing & Innovating in Technology for Humanity (IITH)".

With 330+ full-time Faculty and 5,200+ Students (PG+PhD students accounting for about 60%), IITH has a strong research focus with ~ 4630+ Projects worth of Rs. 1510+ Cr of R&D funding (Rs. 335+ Cr funding in 2024-25), 11,800+ Publications, 2,17,000+ Citations, 530+ Patents (210+ Patents in 2024 and a commitment to “Patent a Day: Mission 365” for 2025 to earn 365 Patents by the end of 2025), and about 260+ Startups (that have generated 1100+ jobs with a revenue of Rs. 1500+ Cr).

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