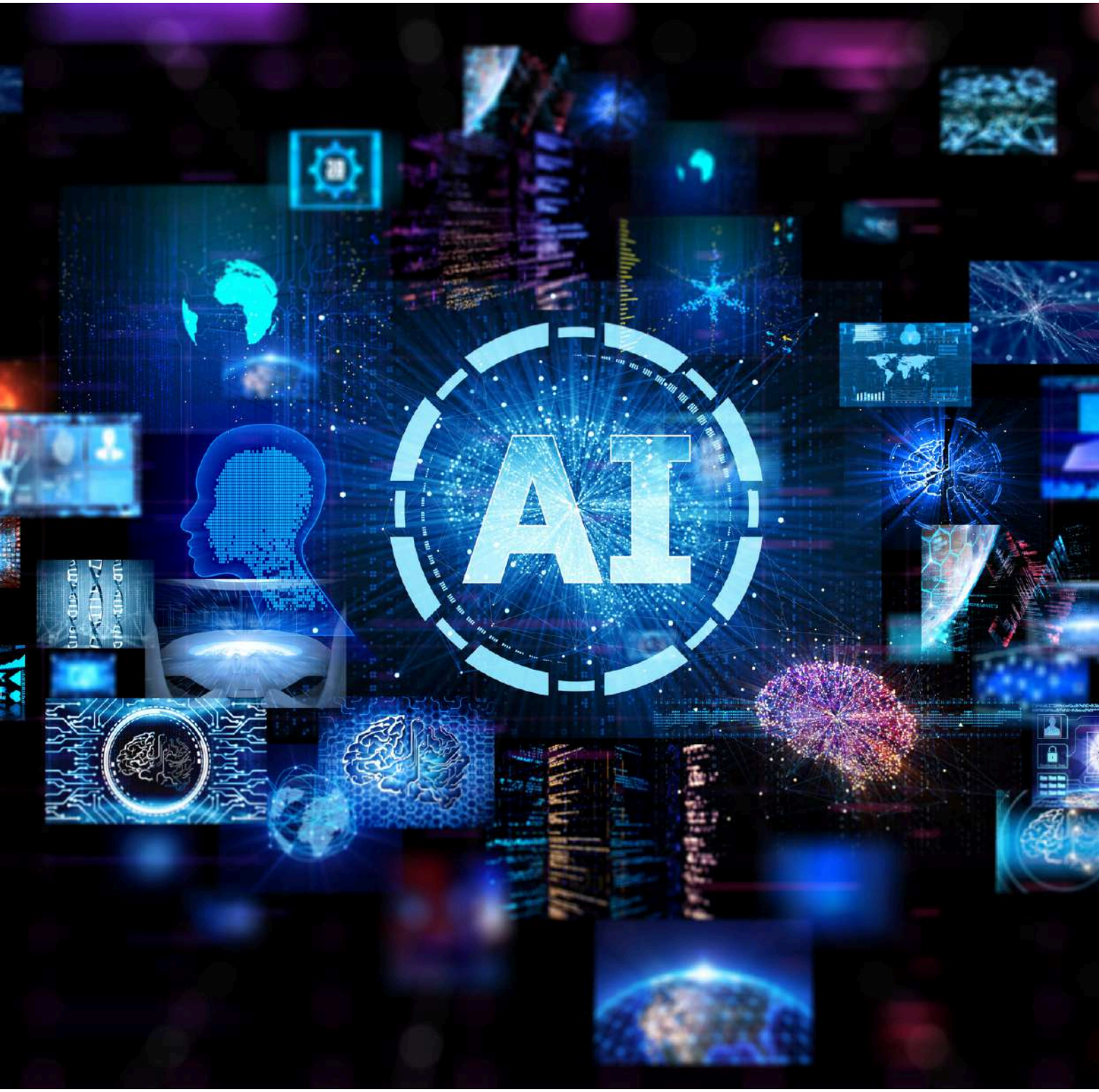
October-December 2024 Edition

DATA PULSE



HUB DATA
IIIT HYDERABAD

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
HYDERABAD

National Mission on Interdisciplinary Cyber-Physical Systems
NM-ICPS

सत्यमेव जयते
विज्ञान एवं प्रौद्योगिकी मंत्रालय
MINISTRY OF SCIENCE AND TECHNOLOGY

PROF DEVA PRIYAKUMAR

MESSAGE FROM DIRECTOR

As we transition into a new year, it's the perfect time to reflect on the progress made in the final quarter of 2024. This period showcased the incredible dedication and innovation of our team, marked by groundbreaking strides in AI research, impactful workshops, and meaningful collaborations.

While we take pride in these achievements, 2025 presents us with a fresh horizon of possibilities. Together, let's continue to push the boundaries of innovation, foster collaborations, and create solutions that leave a lasting impact on technology and society.

Thank you for your relentless efforts and passion for excellence. Here's to a year filled with growth, new milestones, and greater accomplishments!

DR JAY MOOKHERJE

MESSAGE FROM CEO

As we end 2024 and step into 2025, I want to take a moment to reflect on what we've accomplished together and express my deepest gratitude for hard work, resilience, and unwavering commitment of my team. From reaching important milestones to overcoming obstacles, each one of you has played a crucial role in making our success possible.

As we look forward to 2025, I am filled with optimism for what lies ahead. With your continued innovation, collaboration, and drive, I'm confident we will reach even greater heights in the months to come. Thank you for your tireless contributions, for supporting one another, and for making this organization a place where excellence thrives. Wishing you and your families a prosperous New Year.

TIPS 5.0 WORKSHOP AT ARTPARK IISC BANGALORE

As part of DST's prestigious National Mission in Interdisciplinary Cyber Physical Systems (NM-ICPS), IHub-Data, IIIT Hyderabad team participated in the 5th National Workshop of Technology Innovation in Cyber Physical Systems (TIPS 5.0) at ARTPARK IISc Bangalore on 11 and 12 November, 2024. We showcased AI/ML based technologies in Healthcare and Mobility verticals as well as our exclusive Data Foundation ecosystem.

DST Secretary Prof Abhay Karandikar, NM-ICPS Chairman Dr Kris Gopalakrishnan and other members of the Mission at the inauguration of TIPS 5.0.

IHub-Data Director Prof Deva Priyakumar gave a presentation on our journey so far and roadmap for future at TIPS 5.0.

IIIT Hyderabad Director Prof PJ Narayanan, Dean R&D Prof CV Jawahar, IHub-Data Director Prof Deva Priyakumar, CEO Dr Jay Mookherje, CTO Dr Veera Ganesh Yalla, COO Ashutosh Mishra and Product Manager Soumya Das Bhaumik at our stall at ARTPARK, IISc Bangalore for TIPS 5.0.

COLLABORATION WITH NAMS

The National Academy of Medical Sciences (NAMS) collaborated with IIIT Hyderabad and IHub-Data to conduct a course on 'AI in Healthcare' to equip clinical professionals with the knowledge and tools to understand, evaluate, and apply AI in clinical settings, ultimately enhancing patient care and operational efficiency. The course was held from 15 September 2024 to 22 December 2024, during which medical professionals were trained.

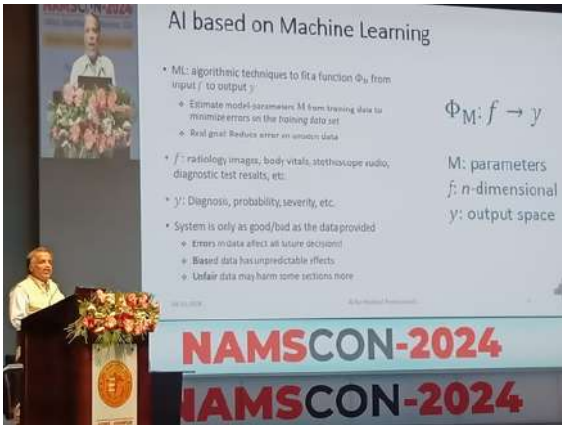
IHUB-DATA'S TWO-WEEK AI & ML COURSE FOR DRDO SCIENTISTS

IHub-Data recently completed a two-week AI & ML course designed exclusively for DRDO scientists from 9 to 20 December, 2024. The program featured sessions by expert faculty, covering advanced topics in artificial intelligence and machine learning. With active participation from the scientists, the course fostered valuable knowledge sharing and skill development, contributing to the advancement of AI in defense research.

IHUB-DATA ACTIVITIES AND EVENTS

IHub-Data at NAMSCON-2024

IHub-Data participated in NAMSCON-2024 from 21-24 November, 2024, in Jodhpur, Rajasthan. With the theme “One Health: Let Us Collaborate to Take Care of Our Health,” the event featured IIIT-H Director Prof PJ Narayanan and Prof Vinok PK as panel members. Our team showcased AI-driven healthcare solutions and explored collaborations to promote holistic health.



AI for Healthcare Workshop

The IHub-Data team attended the 'Harnessing AI for Healthcare Transformation' workshop at IIT Hyderabad from 16 to 18 December, 2024. The event brought together experts to discuss advanced AI research and explore strategic healthcare partnerships.

French Embassy Officials Visit

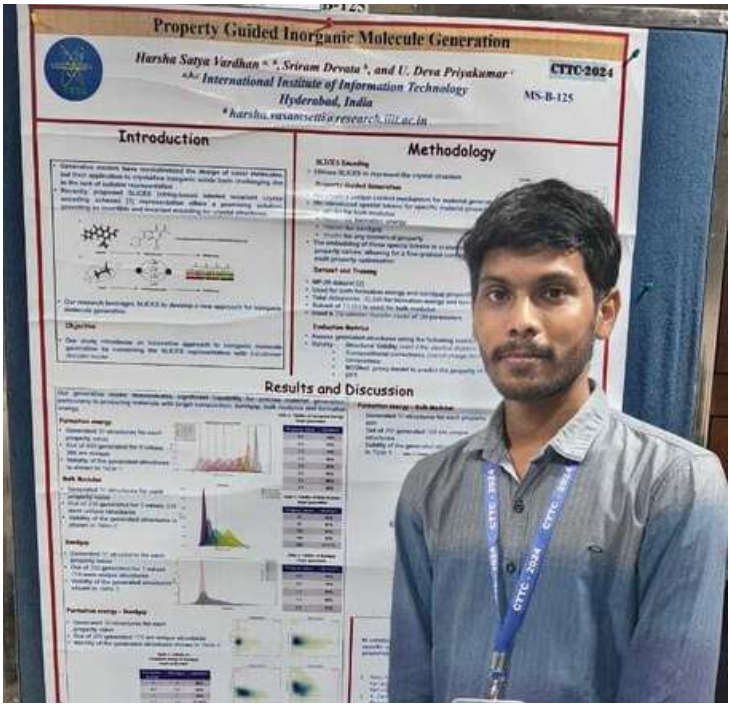
French Embassy officials Marie Khater (Counsellor for Energy and Digital Technologies), Moulshree Dagar (Attaché Agriculture and Health, Regional Economic Department) and Udit Malik (Deputy Head of Digital Economy and Sustainable Cities) visited IHub-Data on 21 November, 2024. We had an elaborate discussion about our work in the 'AI In Healthcare' segment and explored possible collaborations in the future.

NIST-ITL Visit

IHub-Data hosted Dr Ram D. Sriram, Chief of the Software & Systems Division in the United States' National Institute of Standards and Technology (NIST)'s Information Technology Laboratory (ITL), on 12 December, 2024. IIIT Hyderabad Director Prof PJ Narayanan, Head - Healthcare Prof Bapi Raju, IHub-Data CTO Dr Veera Ganesh Yalla along with Prof Maitreya Maity, Dr Kamalaker Dadi and Dr Arjun Rajasekhar met with him. The discussion focused on IIIT Hyderabad and IHub-Data's research activities in AI in Healthcare and the work of NIST in this area.

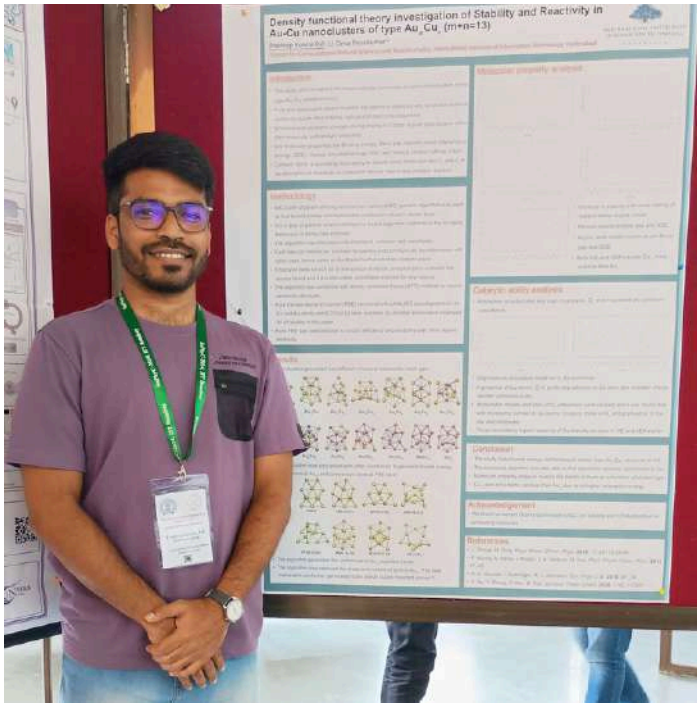
Poster Presentation at CTTC-2024

IHub-Data Research Intern Harsha Satyavardhan Vasamsetti presented a poster at Current Trends in Theoreticals Chemistry (CTTC-2024) at Bhaba Atomic Research Centre, Mumbai on "Property Guided Inorganic Molecule Generation" from 26-28 September, 2024.



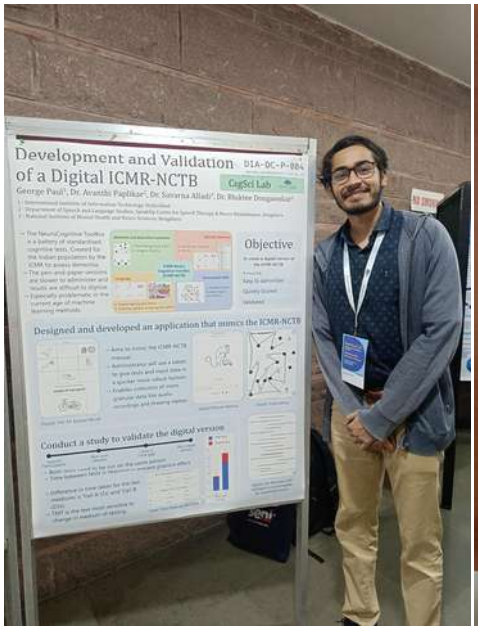
Physical Chemistry Symposium - 2024

IIIT Hyderabad Doctoral Student Pradeep Kumar Pal presented a poster on "Density functional theory investigation of Stability and Reactivity in Au-Cu nanoclusters of type Au_m Cu_n (m+n=13)" at the Physical Chemistry Symposium at IIT Bombay from 22-25 October, 2024.



SmartMat 2024
The International Conference on Smart Materials and Nanotechnology was held at Chiangmai, Thailand from 5-8 November, 2024. Prof Deva Priyakumar gave a talk on "Property Guided Inorganic Molecule Generation".

Workshop at Delhi & Hyderabad
The first cohort of the "Orientation on AI for Medical Professionals," held in collaboration with NAMS, concluded with offline sessions in Delhi on 14 December and at IIIT-H on 22 December. The 3-month program saw 141 senior medical professionals participate, with Dr Vinod PK and Dr Kamalaker Dadi representing IHub-Data.



DemCon 2024
DemCon 2024 was successfully held on 29 and 30 November in Bangalore. IIIT Hyderabad research scholar George Paul presented his poster and his work on Digital Application of ICMR Neuro-Cognitive Tool Box, was featured in the conference book.

BLOG
IDD117K DETECTION DATASET

The newly released IDD-117K dataset comprises of two parts:

1. IDD-Detection, released (earlier in 2018), and
2. IDD-95K-Detection, recently added.

IDD-Detection dataset comprises of three partitions: 31569 for train (images and annotation), 10225 for validation (images and annotation) and 4794 for test (images).

IDD-95K-Detection dataset comprises of three partitions: 65328 for train (images and annotation), 9977 for validation (images and annotation) and 19850 for test (images).

This comprehensive dataset IDD117K-Detection provides: 96897 for train (images and annotation), 20202 for validation (images and annotation), and 24644 for test (images); i.e., a total of 117,099 images for train & validation.

The annotations for test images, from both parts are not released in public.

The IDD95K dataset is an extensive object detection dataset comprising 95,155 images with corresponding annotations provided in JSON formats. The dataset is specifically designed for training and evaluating object detection models across various Indian driving scenes.

Dataset Distribution

The dataset is divided into three subsets: training, validation, and testing, following a 70:10:20 ratio. The split statistics are as follows:

- Training Set: 65328 images
- Validation Set: 9977 images
- Test Set: 19850 images

Classes:

The dataset includes a diverse set of 13 classes mainly traffic participants from person and rider to traffic signs, pole and even vehicle fallback. Each of these classes are most commonly occurring on Indian unstructured driving scenes. The list of classes are as follows:

1. Person 2. Rider - bicycle 3. Autorickshaw 4. Car 5. Truck 6. Bus 7. Pole 8. Traffic Light 9. Traffic Sign 10. Vehicle Fallback 11. Ego vehicle

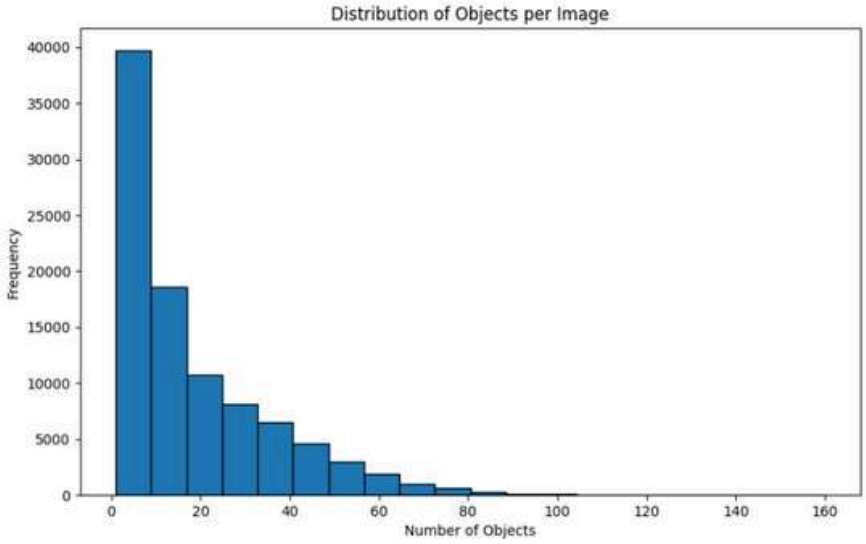
Annotations

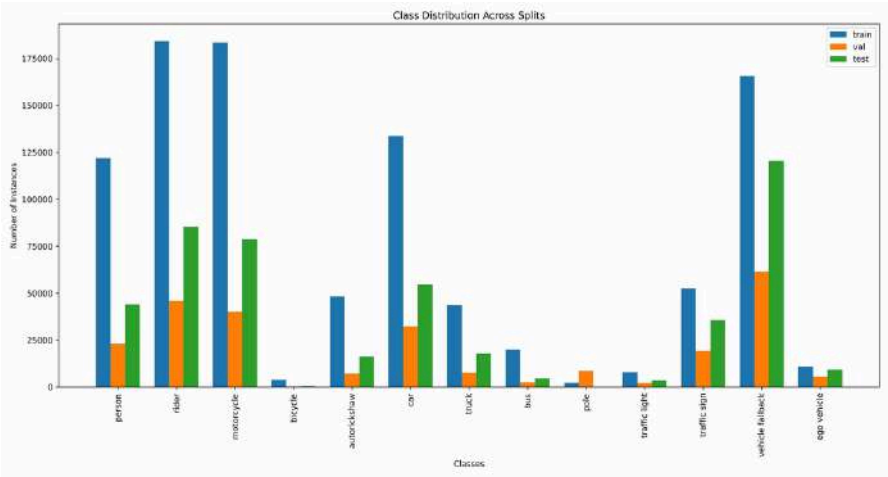
The IDD95k dataset contains a total of 1,706,768 annotated instances across all classes. Each instance is precisely labeled, facilitating accurate training and evaluation of object detection models.

Distribution Statistics

Objects per Image

The dataset has a varying number of objects annotated per image, providing a robust distribution for model training.



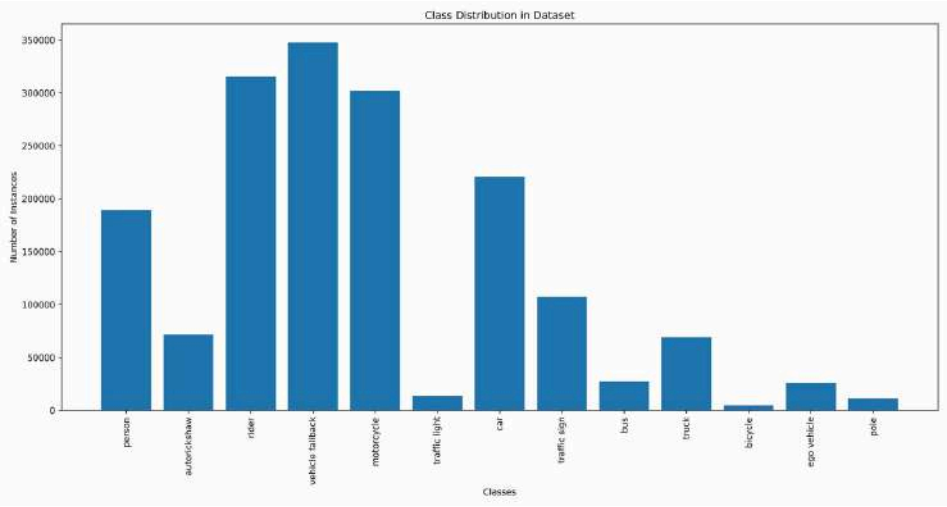


Class Distribution

The distribution of objects across different classes has been visualized to give insights into the dataset's balance and skewness. These plots provide crucial information for understanding class imbalances, which is essential for model tuning and evaluation.

Classwise Distribution in Train, Test, and Validation Sets

The dataset maintains a consistent class distribution across the training, validation, and test sets. Detailed plots are available to illustrate these distributions, aiding in the analysis of model performance across different subsets.



Dataset Link: datafoundation.iiit.ac.in/smart-mobility

The IDD100k dataset is an extensive object detection dataset comprising images with corresponding annotations provided in JSON formats. The dataset is specifically designed for training and evaluating object detection models across various Indian driving scenes.

- Pranav Varudkar

STARTUPS FUNDING OPPORTUNITY

HUBDATA
IIIT HYDERABAD

ACCELERATING
DEEP TECH

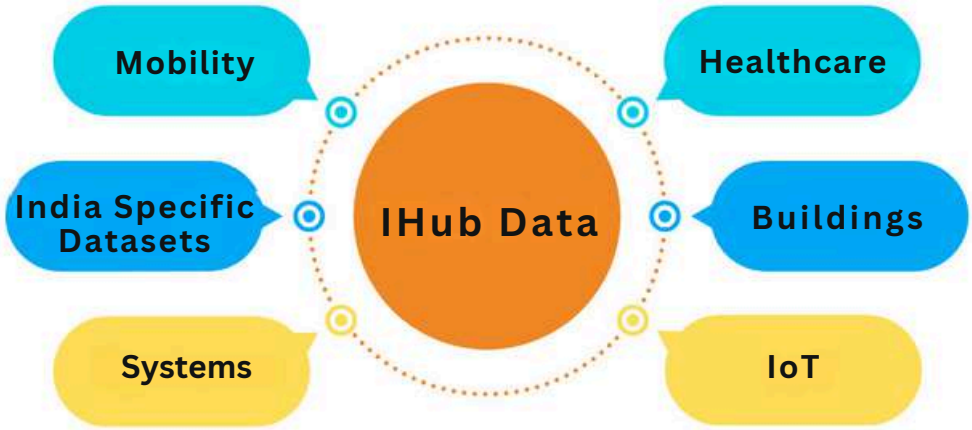
HDFC BANK
PARIVARTAN
A step towards sustainable progress

StartUp
BuildUp

AI FOR SOCIAL GOOD

WE ARE INVITING APPLICATIONS FOR OUR ACCELERATOR PROGRAM FOR DEEP TECH AI STARTUPS IN HEALTHCARE, MOBILITY AND MACHINE LEARNING

IHUB-DATA FAMILY



Our Vision

- To be a global leader in research outcomes that positively impact society through technologies translated into local industries and governmental agencies.
- To play a central role in the advancement and adoption of data-driven technologies through proactive strategies in data bank curation and service creation.
- To become the pre-eminent reference for datasets for AI researchers worldwide and develop solutions using these datasets to address population-scale challenges.

Our Mission

- To help coordinate and enhance national research and solution development efforts in Data (Banks, Services and Analytics) areas and take them to the highest global academic standards.
- Translation of technologies into viable products and promoting startups based on those technologies with applications towards the betterment of the society.
- To catalyse, nurture, and enable the growth of an ecosystem with researchers, technologists, practitioners and entrepreneurs in the area of data-driven solutions to the local problems.

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