July-September 2024 Edition

# DATA PULSE



HUBDATA
IIIT HYDERABAD

INTERNATIONAL INSTITUTE OF
INFORMATION TECHNOLOGY
HYDERABAD

National Mission on Interdisciplinary Cyber-Physical Systems
NM-ICPS

विज्ञान एवं
प्रौद्योगिकी मंत्रालय
MINISTRY OF
SCIENCE AND
TECHNOLOGY
सत्यमेव जयते

## MESSAGE FROM DIRECTOR

IHub-Data had a great third quarter, thanks to the consistent efforts of our team. There were highlights from this quarter that remain significant in our journey. The hosting of 'AI In Healthcare' event as a Curtain Raiser to 'Global AI Summit' of the Telangana government, was a moment of pride.

In the upcoming final quarter, we wish to continue our work towards taking technology from lab to land.

**PROF DEVA PRIYAKUMAR**

## MESSAGE FROM CEO
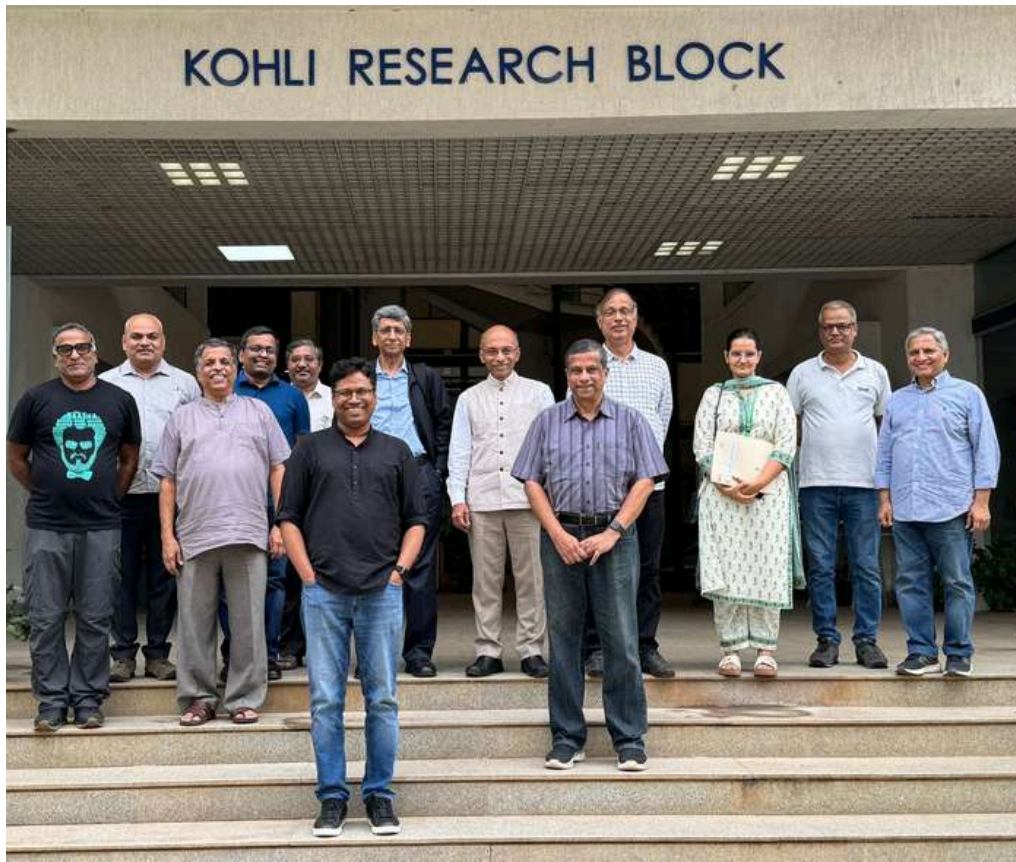
As we enter the final quarter of the year, we look back at the success from the last quarter to chart our path ahead. Being the Technology Innovation Hub for Data, our focus remains on collecting datasets that can be accessed by researchers. Meanwhile, our attention continues to be on our multiple projects in the Smart Mobility and Healthcare verticals. In our ongoing efforts to support startups we have partnered with the Wadhwani Foundation to provide not only funding support but also to get guidance from seasoned industry experts.

We look forward to another successful quarter ahead.
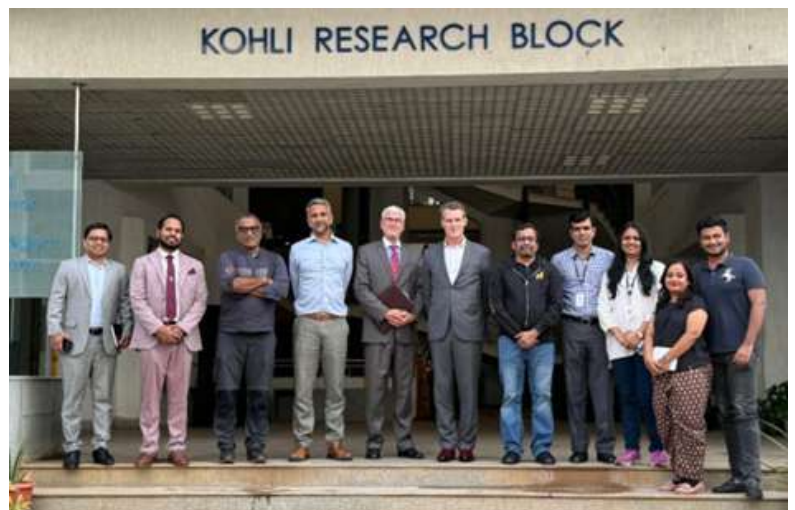
**DR JAY MOOKHERJE**

# EXHIBITION OF INNOVATION



Prof. Anurag Kumar and Shri Ananth Krishnan, visited IHUB-Data in September 2024. They interacted with IHub-Data CEO Jay Mookherje, IIIT Hyderabad Director Prof. PJ Narayanan and other senior IIIT professors and Hub members during this visit. They spent time engaging with various project teams and were given demos of multiple translation initiatives, including the two-wheeler safety system, iRaste road safety initiative, oral cancer detection app, and drone technologies. They also toured Micro labs and the newly established IDEA and Pragathi labs, which are focused on promoting innovation and research. Finally, they stopped at the Centre for Innovation and Entrepreneurship (CIE), where they explored how we support startups and tech ventures. It was a great opportunity to showcase the work our teams have been doing to turn advanced technology into practical solutions for real-world impact.
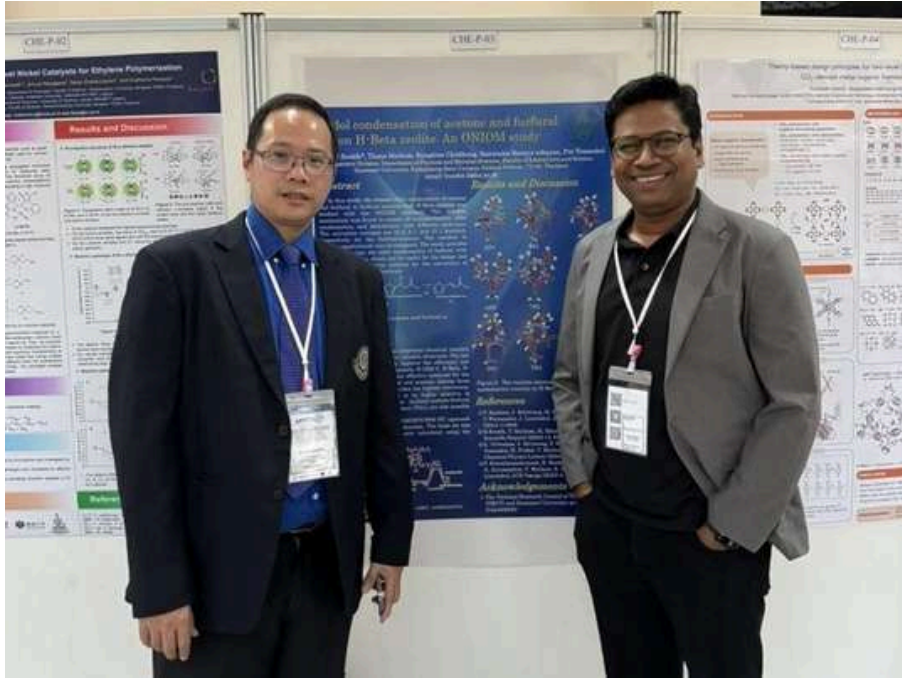
# IHUB-DATA ACTIVITIES AND EVENTS



University of Hyderabad Vice Chancellor Dr BJ Rao, Prof MG Krishna and Prof SL Sabat visited IIIT Hyderabad. They were welcomed by IHub-Data CEO Jay Mookherje, IIIT Director P J Narayanan, Dean R&D Jawahar, IHub-Data Project Director Deva Priyakumar. Jay Mookherje, CTO Veera Ganesh Yalla and Innovation and Startups Manager Thanuja Krishnamoorthy showcased various projects and initiatives taken by IHub-Data. They were also given a tour of CIE (Centre for Innovation and Entrepreneurship) - the technology business Incubator of IIIT Hyderabad.



IHub-Data hosted Eric A Smith, Senior Advisor in the U.S. State Department's Office of the Special Envoy for Critical and Emerging Technology, and the US Consulate General Hyderabad's Economic team and Foreign Commercial Services team. There was a good discussion about the latest trends in AI/ML and Quantum technologies.

Prof. U. Deva Priyakumar presented the paper "GraphDDI: Graph Neural Network for Prediction of Drug-Drug Interaction" at the International Conference on AI in Healthcare (AIiH 2024) hosted at the Bay Campus of Swansea University from 4th to 6th September 2024.





Research and Innovation Circle of Hyderabad and International Institute of Information Technology Hyderabad (IIIT Hyderabad) co-hosted "AI in Healthcare" event as Curtain Raiser to Global AI Summit 2024. IHub-Data CEO Jay Mookherje presented a welcome address to the audience on the growing importance of AI in the field of healthcare and about multiple IHub-Data projects in this domain.

# Data Pulse



C K Raju, Head of Programs, IHub-Data, was the Chief Guest at the Induction Session for Technical Clubs at Vidya Jyothi Institute of Technology (VJIT), Hyderabad. Raju shared insights on the importance of tech skills and innovation for the generation data group (GDG) and decision support system (DSS)



Prof Anoop Namboodiri held a session on "Biometrics: Establishing your identity - An extreme classification problem" for participants of IHub-Data's AI/ML training program in September.



IHub-Data participated in "Catalyst Compass 2024", a premier event on healthcare innovation held on August 12 organized by the Mazumdar Shaw Medical Foundation, Bengaluru. Thanuja Krishnamoorthy, Innovation and Startup Manager, showcased cutting-edge AI-driven healthcare solutions and engaged with industry leaders, investors, and healthcare professionals.

# STARTUP FUNDING OPPORTUNITIES



Calling Healthcare and Mobility DeepTech AI/ML startups to raise funding and accelerate growth with Wadhwani Liftoff in collaboration with Wadhwani Foundation! This 4-12 week programme will help in funding and growth of Early, Prototype or MVP Stage Startups in these domains.



Calling all DeepTech, MedTech, MediaTech, and Mobility startups! Ready to take your MVP to the next level?

The Avishkar Winter Cohort 2024 of CIE is here to accelerate your growth! 💡 Get seed funding from IHub-Data, research support from IIITH, strategic guidance, investor connections, and more!

What's in it for you?

✅ Seed funding up to INR 40L
✅ Business & GTM mentorship
✅ Access to IIITH's network of experts and investors
✅ Investor pitch readiness

## BLOGS

## COLLABORATING FOR SAFER ROADS: META'S ARIA TEAM EXPLORES THE IHUB-DATA DRIVING SIMULATOR

**Project Aria, in collaboration with IIIT Hyderabad (IIITH), on an exciting initiative aimed at improving driver-assist technologies. The collaboration focuses on using Aria glasses and sensors to gather real-world data to enhance driver behavior analysis, situational awareness, and safety systems. As part of the project, the Aria team visited IIIT Hyderabad in mid August for a series of meetings, presentations, and practical demonstrat**

**Key Highlights of the Visit:**

**Expert Visit**
We were honoured to welcome the distinguished team from Meta, including James Fort, Research Product Manager; Shangyi Cheng, Research Engineer; and Vijay Baiyya, Research Engineer. Their visit underscored the growing global interest in our technologies and highlighted the importance of our collaboration.

**Meeting with IIIT-H Professors**
Led by Dr. Shankar and Avijit Dasgupta, the Aria team met with Prof. CV Jawahar and Dr. Anbumani to discuss how the technology could be applied to enhance driver-assistance systems. This meeting provided insights into leveraging real-time data capture to improve driving safety and navigation.

**Bodhyaan Data Capture Platform Setup**

The setup of the Bodhyaan platform capture system, led by Dr. Shankar and Dr. Anbumani, was a key focus. This setup uses Aria glasses, GoPro's and sensors to gather critical data on driver behavior and environmental factors, essential for developing advanced driver-assist systems.

**Hands-On Experience with the Simulator Platform**

During their visit, the Meta team engaged deeply with our advanced Simulator Platform. They participated in a comprehensive demonstration and trials using the innovative Aria glasses, gaining firsthand experience of our technology's capabilities in real-world driving scenarios.



**Visit to the Applied Research Lab (ARL)**

The Aria team also explored the Applied Research Lab (ARL), where detailed data annotation is carried out to support driver-assist research. ARL's expertise in annotating captured driving data is essential for developing more effective driver-assistance systems.

**City Exploration**

Beyond technical sessions, they took a road trip through Hyderabad's bustling streets, which provided valuable real-world data on traffic patterns, road conditions, and driver behavior. This hands-on experience will help refine the project's data capture efforts in the diverse traffic environments typical of Indian cities. This real-world data is essential for refining driver-assistance systems, particularly in complex and dynamic driving environments.

**-Blog by Pranav Varudkar**

# AFFORDABLE NON-INVASIVE BIO-IMPEDANCE BELT: A LIFESAVER FOR HEART FAILURE PATIENTS

A simple cost effective non-invasive wearable bioimpedance belt can be a boon for susceptible heart failure patients.



There are about 64 million cases of heart failure worldwide as per AHA (American Heart Association). Heart failure is a progressive clinical syndrome characterized by a structural abnormality of heart, in which heart is unable to pump sufficient blood to meet the body's requirement.

Currently there are invasive as well as some non-invasive solutions to monitor susceptible heart failure patients. But most of these are quite expensive. Moreover, it is estimated half of these potential patient groups, don't need an invasive solution. A non – invasive Bio-impedance belt to monitor fluid buildup in thoracic region could be a potential cost-effective solution when used in conjunction with other non-invasive biomonitoring parameters like electrocardiogram (ECG), heart rate and motion activity detection.
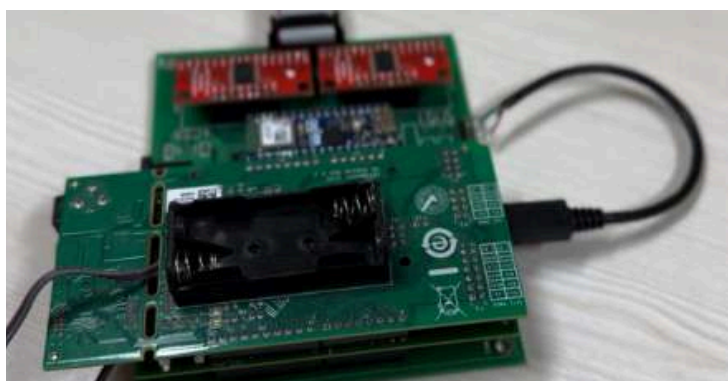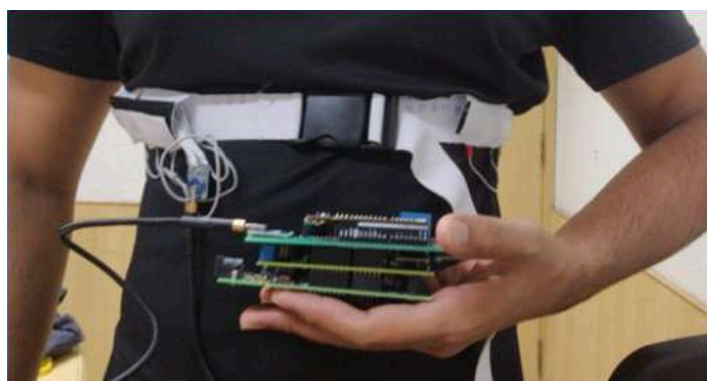
The buildup of thoracic fluid can start days to weeks, before clinical symptoms such as shortness of breath, fatigue and swelling (edema) becomes apparent. To understand this mechanism of fluid buildup, one needs to deep dive into the pathophysiology of heart failure.

**Heart Failure Pathophysiology:**

In heart failure, the heart's ability to pump blood effectively is compromised. This leads to an increased pressure in the veins and capillaries that return blood to the heart, particularly those in the lungs. As the pressure in this blood vessel increases, fluid begins to leak into the surrounding lung tissue, causing pulmonary congestion. This fluid buildup in thoracic cavity is a direct result of heart's reduced pumping efficiency. Detecting these changes early, can help in timely intervention and management. When I say fluid buildup, it will be noteworthy to mention what this fluid is. The fluid mentioned here is a combination of plasma and interstitial fluid. The interstitial fluid are fluids that exist in spaces between cells in the tissues.

**Bio-impedance Technology:**

We can monitor this fluid buildup using a non-invasive Bio-impedance belt. The Bio-impedance technology is gaining prominence owing to its cost effectiveness and ease of use. The principle behind this is bioimpedance that measures the opposition to the flow of electric current through body tissues, which varies with the amount of fluid present. The electrodes placed on the body, deliver a small electric current and the impedance (resistance) to this current flow is measured. Lower impedance means, higher the fluid content. The beauty is this can be monitored continuously using a wearable belt in a home care set up.



**What do we do if there is a presence of such fluid buildup:**

When fluid builds up in potential heart failure patient, prompt and effective treatment is essential to manage symptoms, prevent complications and improve the quality of life. This can be treated by lifestyle modification, drugs like diuretics, ACE Inhibitors, ARB's or Beta Blockers type medications. Effectively this will prevent a certain heart failure.

At IIIT-H Data IHub Foundation - Hyderabad, a team led by Prof. Deva Priyakumar, Dr Maitreya Maity, Dr Kiron Varsha and team has developed a very cost effective proto of a Wearable Bioimpedance Belt. The solution was developed by AI/ML algorithms using enough data from Indian population. This technology is now ready for tech transfer. We look forward for an association with MNC giants or Indian medical device manufacturers to use this opportunity to productize it.

**-Blog byJudish Raj**

## 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.

Scan this QR code or
visit our website to know more about us:
https://ihub-data.iiit.ac.in/