

MINUTES OF THE MEETING OF MEMBERS OF HUB GOVERNING BOARD OF NMICPS TECHNOLOGY INNOVATION HUB ON AUTONOMOUS NAVIGATION (TIHAN) FOUNDATION HELD ON THURSDAY 15TH DECEMBER 2022 AT #201 BLOCK-A, DIRECTOR'S BOARD ROOM, IIT HYDERABAD, KANDI CAMPUS, SANGAREDDY, MEDAK, TELANGANA, INDIA-502285 AT 10.30 AM.

Time of commencement of the Meeting: 10.30 AM

Time of conclusion of the Meeting: 11.30 AM

1. ATTENDANCE

Sr. No.	Name	Designation	Mode of Attendance Physical/Electronic mode
Directors:			
1.	Prof. B S Murty	Chairman	Physically
2.	Prof. Rajalakshmi Pachamuthu	Project Director, Member Secretary	Physically
3.	Dr. Ekta Kapoor	Head, FFT, DST	Through VC from Delhi
4.	Prof. Chandrashekhar Sharma	Dean Sponsored Research & Consultancy, Academic Member	Physically
5.	Prof. Surya Kumar S	Dean Innovation, Translation & Startups, Academic Member	Through VC from Hyderabad
6.	Mr. Samir Kumar	Managing Director, Inventus (India) Advisors, Industry Member	Through VC from Bengaluru
7.	Mr. Kumar N. Sivarajan	Chief Technology Officer, Teias Networks, Industry Member	Through VC from Bengaluru
8.	Dr. Gopichand Katragadda	Founder and CEO at Myelin Foundry, Industry Member	Through VC from Bengaluru
Invitees:			
9.	Dr. Naga Praveen Babu M	HTO (Technical)	Physically
10.	CA Saurabh Dashottar	Internal Auditor	Through VC from Hyderabad
11.	CS Jayata Agarwal	Practising Company Secretary	Through VC from Jaipur

2. ELECTION OF THE CHAIRMAN:

As per article 27 of Articles of Association of the company, the Director of IIT Hyderabad (Host Institute) is deemed to be the chairman of TiHAN Foundations and as per Mission communications; Chairman of Host Institute will be Chairman of the HGB. Thus, **Prof. B. S. Murty** was elected as the chairman of the meeting and occupied the chair.

3. QUORUM:

At 10.30 A.M., the Chairman welcomed the Members present physically and through video conferencing. Thereafter, the Chairman announced that the requisite quorum was present and called the Meeting to order. The Chairman extended a warm and hearty welcome to all the members present at the Meeting of the Hub Governing Board (HGB) of the Company.

4. LEAVE OF ABSENCE:

Leave of absence was granted to Mr. Krishna Bodanapu and Dr. Bheemarjuna Reddy Tamma for not attending the meeting, due to unavoidable circumstances and had requested for the same.

5. CONFIRMATION OF MINUTES OF THE MEETING OF MEMBERS OF HGB HELD ON 27TH JUNE 2022:

Minutes of the meeting of the Hub Governing Board held on 27th June 2022 duly initialed by the Chairman were placed before the Board and Board approved the same. Prof. Rajalakshmi explained the activities done and decisions taken in previous meeting to all the members.

6. LAUNCH OF MANUAL OF USED CASES OF AUTONOMOUS NAVIGATION:

Prof. P Rajalakshmi- Project Director/Member Secretary informed the board that India's first Autonomous Navigation Testbed (Aerial & terrestrials) facility, TiHAN was inaugurated by Dr. Jitendra Singh, Hon'ble Minister of State for Science and Technology & Earth Sciences at IIT Hyderabad on 4th July 2022.

After which the team had gone through the used cases that a connected and autonomous vehicle should undergo before it comes on road. Almost around 73 use cases were tested and validated, and a Manual of use cases of Connected and Autonomous vehicles carried out at TiHAN Testbed is prepared for the same.

Prof. B. S. Murty, Chairman along with the board members proudly announced the launch of the Manual of use cases of Connected and Autonomous Vehicles.

7. REVIEW ON THE ACTIVITIES AND ACCOMPLISHMENTS OF THE HUB SO FAR:

Project Director explained about the Research and Technology that Nurturing the R&D portfolio of the hub and promotes commercially viable translational research. She further informed about increase in CPS Research Base Hub projects - 26 collaborative R&D projects. Periodic project reviews have been done by through expert project review committee. She informed the board about the number of Technologies (IP, Licensing, Patent Etc.) that 8 (1 copyright on Autonomous navigation testbed, 6 patents -Bio-inspired UAV, System with HSI, Energy efficient biomimetic, 1 Trademark on TiHAN Logo.

She has also explained about the technology Products that 25 ((Bio-inspired UAVs, UAV with high end sensors- Lidar/HIS, First Version of Hindi ASR, Driving Under Influence Simulator, Inhouse developed UGV and UAV kits, Vaman boards, DSRC- RSU, Autonomous/Remote Operated Surf Board, A Conversational Hindi chatbot is developed using an open source tool, A speaker recognition system is developed using GMM technique, A Hindi Text to speech synthesizer is developed using deep learning based tacotron 2 model, Web-based Voice Activity Detection, GPS Based Navigation of Campus Shuttle Vehicle, Marker Based Landing of Unmanned Aerial Vehicles (UAVs), Swarm of Network Connected Unmanned Aerial Vehicles (UAVs), Triboelectric Nano Generator (TENG) Based Flapping Wing Nano Aerial Vehicles, Heavy Payload Unmanned Aerial Vehicle (UAV), Development of Autonomous Emergency Braking (AEB) for Vulnerable Road Users (Pedestrians) in Indian Context, GPS Based Navigation of Autonomous e-bike for last mile connectivity, Development of Automated Lane Keep Assist System (ALKS) for M1 Category Vehicles, Development of Lane Departure Warning System (LDWS) for SAE Level 3 Vehicles, Maneuvering Performance of Bioinspired Quad Wing Flapping Wing Aerial Vehicle, Flapping Wing Unmanned Aerial Vehicles with Obstacle detection in controlled environments).

She further informed about the activities taken by the TiHAN in Research and Technology development, Industry Collaboration, Innovation, Entrepreneurship, Start-up Ecosystem, International Collaboration, Human Resource and Skill Development and Testbed activities. In brief,

Technology Development: No of Technologies (IP, Licensing, Patent Etc.) - 8, Technology Products - 25, Publications, PR and other Intellectual activities - 59, Increase in CPS Research Base - 41.

Entrepreneurship Development: Technology Business Incubator (TBI) - 1, Start-ups & Spin-off companies - 9, GCC - Grand Challenges & Competitions - 2, Promotion and Acceleration of Young and Aspiring technology entrepreneurs (PRAYAS) - 1, CPS-Entrepreneur in Residence (EIR) - 2, Dedicated Innovation Accelerator (DIAL) - 1, CPS-Seed Support System (CPS-SSS) - 0, Job Creation – 960.

Human Resource Development: Graduate Fellowships - 187, Post Graduate Fellowships - 91, Doctoral Fellowships - 72, Faculty Fellowships - 12, Chair Professors - 3, Skill Development - 2374, Postdoctoral Fellowships – 15.

Technology Development: International Collaborations - 14.

On Entrepreneurship, she informed that under Incubation activities- startup funding, attracting private funding like CSR, VCs and equity based. She further informed about technology commercialization, promotional outreach, and Accelerator programs for early-stage startups.

On Industry relations Prof. Rajalakshmi informed the board about the joint R&D initiatives on a cost-sharing basis and consultancy projects with both govt. and private entities. Till date TiHAN has made collaborations with 32 Industries. Suzuki Motors Corporation sent vehicles from Japan for RnD on ADAS for Indian Scenarios and testing in TiHAN testbed and for this research and development, Data collection and algorithm developments are going on proposals with Industries and Govt. labs are under discussions.

8. BUDGET DISCUSSION:

Prof. Rajalakshmi presented the fund utilization received from DST till date. She informed that the first-year sanctioned amount of Rs. 20.25 Crores was received from DST and utilized for the purpose successfully. The second-year grant of Rs. 32.38 Crores from DST was sanctioned on 10-06-2022, of this a credit limit of Rs. 19.68 Crores was provided, in which more than 80% is utilized successfully for the purpose. Hence requesting to release the remaining Rs. 12.70 Crores towards 2nd year sanctioned grant.

9. SUGGESTIONS FROM THE MEMBERS, DISCUSSION, AND ACTION PLAN:

The Chairman invited all the Industry Representatives for their Opinions and Suggestion. Following points were discussed & suggested by the Board members

- On startups, review mechanism is required for Startups. Mr. Sameer Kumar suggested a rigorous half yearly review process to be adopted. Mr. Sameer Kumar raised a hand to provide the necessary help to all the start-ups in growing.
- Mr. Gopichand Katragadda suggested a mechanism for job creation. He also mentioned about the grant received from the industry can be quantified in dollars or rupees.
- Ms. Ekta Kapoor- Mission Director DST informed the board about the parameters of job creation that the idea is to create an HUB for startups and number of people who will be connected to the hub for projects will be counted as Job Creation. She clarified that on job creation, skill development can be shown under the job creation. She emphasized funding from Industry and line ministries. Two-day event is planned by DST with TIHs, Industry and Line ministries under CPS in the month of February 2023.

- Prof. Murty suggested to have diploma programs or workshops or some training sessions for the students to support employment. He invited DST to attend Innovation Day on January 7th, 2023. He also recommended, in next HGB meeting presentation on Sustainability of Hub.
- Mr. Kumar Sivarajan recommended the self-sufficiency goal for TiHAN after the DST funding will be completed for future growth of TiHAN.

VOTE OF THANKS:

Chairman announced the summary of the discussion, recommendations and decisions taken in the meeting. Before the conclusion of the Meeting, Chairman made the roll call at the conclusion of the meeting and ensured the presence of quorum throughout the meeting.

With the item of the agenda being transacted, the chairman thanked the members for making it convenient to attend the meeting and thanked them for their active participation. Thereafter, the chairman declared the meeting as concluded.

Signatures:

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Prof. B. S. Murty
Chairman of HGB

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Prof. Rajalakshmi
Project Director/Member Secretary