



IIT Mandi iHub & HCI Foundation
Technology in Harmony with Human Needs

Advertisement for Call for Proposals IIT Mandi iHub and HCI Foundation

Last Date to Apply: 15th April 2024 to 25th April 2024

About iHub:

IIT Mandi iHub and HCI Foundation (iHub) is a Section 8 company established under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS). The vision of iHub is "to be an internationally recognized hub that nurtures HCI research, enables technology translation for industry adoption, and scales skill development." For more information, visit www.ihubiitmandi.in

Call for Proposal (CfP):

IIT Mandi iHub and HCI Foundation at the Indian IIT Mandi under the Department of Science and Technology (DST)'s NM-ICPS **invites research proposals** to develop creative and practical-oriented solutions that can be implemented to address real-life problems, within the budget and timelines. The focus area would be on "**Human-Computer Interaction (HCI)**". HCI as a discipline is the confluence of Computer Science, Industrial Design, and Cognitive Science. The Principal Investigators (PI) are expected to design and prototype systems, products, or services by applying independent scientific research methodologies. This should help in developing new technology solutions having industry relevance to HCI. The research proposals must be in the broad area of HCI and its industry applications.

Research Outcomes:

1. Deciphering the Undecipherable

E.g.1 Unveiling the Mysteries of Ancient Scripts and Inscriptions using Deep Tech like the Indus Valley script, Etruscan inscriptions, and the Voynich manuscript, understanding and improving the readability of faded or obscured inscriptions.

E.g.2 Developing a Human-Computer Interaction (HCI) technology to aid communication with patients having impaired cognitive abilities, such as deciphering speech in individuals affected by paralytic strokes.

2. Predicting and preventing disasters and diseases

E.g.1 Developing intuitive interfaces for early, informative, and actionable warning systems, incorporating algorithms for predictive analysis of natural disasters.

E.g.2 Developing a system that assesses the influence of cultural beliefs, social norms, and trust in authorities on the effectiveness of disaster communication strategies delivered through digital platforms, utilizing cognitive computing and cross-cultural research methodologies.

E.g.3 Developing a smartwatch integrated with bio-sensing technology and advanced AI, aimed at advancing health monitoring capabilities and delivering personalized assistance to revolutionize personal well-being management and preventing diseases through wearable technology.

3. Preserving cultural wealth

E.g.1 Preserving Low Resource languages (non-English native languages) through the principles of Large Language Models (LLMs).

E.g.2 Developing an immersive virtual reality (VR) experience to preserve and teach indigenous languages and cultural practices.

E.g.3 Developing smaller and more affordable VR headsets to enhance accessibility and affordability, facilitating mass adoption of virtual reality technology, and promoting culture through computing.

4. Improving Product design and enhancing productivity

E.g.1 Creating an Adaptive robot assistant tailored for collaborative and risk-prone tasks such as high-rise wall painting, window cleaning, and fire services in tall buildings.

E.g.2 Developing a GenAI Tool for assessing product usability and accessibility, along with generating new designs through Gen AI-based enhancements to expand design possibilities.

E.g. 3 Developing footwear empowered by piezoelectric technology to convert kinetic energy from walking or running into usable power for smartphones, with the capability to seamlessly transfer the harvested energy to phones using wireless technology.

5. Processes Enhancement

E.g.1 Addressing Visibility Challenges in Firefighting by Developing a Handheld Computer Vision Tool for Target Identification and Assistance.

E.g.2 Energy efficiency through the incorporation of functional wheels in vehicles with user accessibility.

E.g.3 Developing a methodology to integrate biometric authentication technology into payment systems without device dependency, utilizing fingerprints or retina scans for enhanced security and convenience.

E.g. 4 Enhancing productivity and user experience in language-based applications through the optimization of large language models (LLMs) for mobile phones.

This would be in the backdrop of the technology focus area of IIT Mandi iHub in Human-Computer Interaction (HCI).

The projects so proposed among the above 5 broad areas will be classified under:

1. Experience Technologies
2. Assistive Technologies
3. Device -Led Technologies.
4. Generative Design

Technology areas would broadly cover the areas as:

1. Industrial Design/Usability Engineering
2. Natural Language Processing (NLP)
3. AR & VR including Computer vision and Image processing
4. AI & ML including Generative AI and Cognitive Modelling
5. Haptics

Focus on Industry Adoption would be a critical selection parameter:

1. The development of technology that can be adopted across industries would be the critical goal. To achieve this goal, iHub will focus on proposals with a strong translational component that can result in products, platforms, patents, or initiate a start-up.
2. Developing technology for adoption across any industry would require a multifaceted approach that would include collaboration with multiple disciplines, and with an

- entrepreneurship mindset, with a close and critical eye on industry adoption.
3. The researcher should strive for an industry partner to assist in Alpha-Test/Beta-Test/Product- Market fit for the research base solution with an aspired **Technology Readiness Level of 7 (TRL 7)** or above.
 4. Diversity of the team in terms of skills and expertise including domain and technology would be expected.

Time Frame

Typical proposals are expected to have a one-year timeframe, with exceptional proposals being provided for up to a two-year time frame.

Guidelines to submit the proposal.

1. The proposal can be submitted, either individually or in collaboration, by the Principal Investigator (PI) from Academia (as per point a) or by the Project Leader (PL) on behalf of the industry (as per point b)

Academia:

- a. Research Institute, University with a well-established support system for research. The institute should have been established in India and have NAAC/UGC/AICTE or any equivalent recognition certificate or any other Public/ Government organization/Institute of National Importance.

Industry

- a. Company (Startup, Small, Medium, or Large)/LLP incorporated under the Indian Companies Act, 1956/2013 or the Limited Liability Partnership Act, 2008.
2. The PI/PL shall be responsible for the technical and managerial aspects of the project execution.
 3. Applicants can submit applications for more than one project by filling in a separate application form for each project. However, iHub may fund only one project at a time from a PI/PL.
 4. The project proposal must be submitted in the prescribed format given in the **Google form***.
 5. The applicant from Academia (PI)/Industry (PL) must submit an Endorsement Letter from their parent organization.
 6. Applicants with collaborators (Co-PIs) from Academia and Industry must submit endorsement letters from all the participating entities.
 7. The support under the program will be provided based on the review of project proposals submitted. The decision of TIH in this regard will be final and binding.
 8. The application must be submitted only through the **Google form**.

***Apply here:** <https://forms.gle/LrWfCJZ8X5kZ9TtX6>

Terms and conditions

Equipment purchase

1. All the Assets acquired from the funds will be the property of the iHub and should not be disposed of, encumbered, or utilized for purposes other than those for which the funds had been sanctioned.
2. At the conclusion/ termination of the project, the iHub will be free to sell or otherwise dispose of the assets that are the property of the iHub.
3. By the end of the project, the equipment should be returned to iHub in good condition; if not returned within the period mentioned by the iHub, the rent will be charged to the Principal Investigator (PI)/Project Leader (PL) on a basis as decided by the iHub.
4. In case of damaged equipment, PI/PL is responsible for the repair or for providing new equipment to iHub.
5. The iHub has the discretion to give the Assets to the Institutions or transfer them to any other Institution if it is considered appropriate.
6. Major capital expenditure will be done directly via iHub or with iHub approval.

Funds milestone

1. Funds will be released quarterly and based on milestones.
2. The staff hired by the project funds will only work for the project activities, not for institutional activities. Also, the staff salary will be released every quarter, and staff will be on the payroll of the iHub.
3. The technical evaluation of the Project should be quarterly, and the operational evaluation will be monthly.

Review

1. iHub may designate a Scientist/Specialist or an Expert Panel to visit the Institution periodically to review the progress of the work being carried out and suggest suitable measures to ensure the realization of the objectives of the Project.
2. During the project's implementation, the Institution will provide all facilities to the visiting scientist/specialist or the Expert Panel by way of accommodation, etc., at the time of their visit.
3. The technical evaluation of the project will be done on a quarterly basis, and the operational evaluation will be done on a monthly basis.

Patents and Publications:

1. Investigators are expected to publish research papers emerging from the Project work in leading Journals. All the patents and publications should be published through iHub or by the review from the iHub. The IP Policy of the iHub will govern patents, IP, and other intellectual properties emerging from the project.
2. After the completion of the project, PI/PL and its Host organization are not allowed to file any patents and IPs in the same field or based on the work done under the project for a 1-year period after project closure without the consent of the iHub. Failing to do so will be a breach of the contract and may invite appropriate action.

General guidelines

1. The organization will maintain a separate audited account for the project individually for recurring and non-recurring. The entire amount of funds will be kept in an interest-bearing bank account. All interest and other earnings against the released fund can be adjusted towards the future release of funds.
2. The iHub reserves the right to terminate the project at any stage if it is convinced that the funds have not been properly utilized or satisfactory progress is not being made.
3. If the PI/PL to whom a fund for a project has been sanctioned wishes to leave the institution/organization where the project is based, the PI/PL will inform the iHub of the same at least six months in advance with suitable justification and reasons and in consultation with the iHub, evolve steps to ensure successful completion of the project.
4. The data about the project should be systematically collected, scientifically documented, and submitted to iHub, which later would be placed in the public domain. This clause would not be applicable for projects where legal protection of the know-how generated is necessary.
5. Any products, prototypes, programs, and applications developed as part of the project will need to be reported and submitted with full source code, documentation, and instructions as required by the iHub.
6. The PI/PL will furnish details of any past/ongoing plagiarism, image manipulation, or other professional, or disciplinary case.