



Call for Project Proposals-2022 for IHFC Grand Projects

(Nano-Robotics; Autonomous Vehicles; Blockchain for Applications in Robotics)

Call for Proposals: June 13, 2022

Deadline for Submitting Proposals: July 15, 2022

I-Hub Foundation for Cobotics (IHFC), TIH of IIT-Delhi has been set up under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), DST, Govt. of India on March 2020. Our vision and mission are to translate cutting-edge research, into state-of-the-art technology products and services for Cobotics (collaborative robotics) in the four verticals viz. Defence, Industry, Agriculture, and Medical for the benefit of society. Our current grand projects at IHFC comprise Healthcare Robotics, Rehabilitation Robotics, Medical Simulator, Human-Robot Interaction (HRI), Drone Applications, Industry 4.0 & Beyond, and Intelligent Sensing and Secured Communication (ISSC). In order to expand our research frontiers in the field of cobotics, the following domains are being considered in this call for proposal.

GRAND PROJECT AREAS

The aim of the IHFC Grand project on cobotics-2022 call for proposal is to enhance value creation through, research and innovation for the development of new technologies, products, applications, solutions, services, and business models in the following thematic research areas:

- Nano Robotics
- Autonomous Vehicles
- Blockchain for Applications in Robotics

Nano Robotics

Nanorobots would constitute a “smart” structure capable of actuation, sensing, signalling, information processing, intelligence, and swarm behaviour at the nanoscale level. The dimensional specification of these machines, often finds maximum compatibility with biological structures at the cellular level, thereby branching into the domain of biology or biochemistry. These devices can then be more appropriately labelled as bio-machines, basically operating at the nanoscale level. The main features that form the foundation of bio-nano robots are their group functionality, self-replication, and self-healing. Nano-robotics lies at the intersection of multiple fundamental disciplines involving molecular dynamics (both classical and quantum), mathematical modelling, biochemistry, and NEMS-based fabrication. Some of the key research and development areas are:

- Nano drug developments
- Drug delivery system
- Nano Manipulation and Imaging
- Virtual reality/ Haptic interface
- Military and defence-based application



Autonomous Vehicles

Autonomous Vehicles (AVs) are intelligent transport system (ITS) that improves road safety and security by avoiding human errors. AVs combine sensor and map data and based on machine learning (i.e., “experience”), they can classify objects in their surroundings and predict how they are likely to behave, in relation to other moving vehicles, pedestrians and cyclists, stationary objects (e.g., signs, trees, traffic cones) and can make decisions about speed and steering inputs. Some of the key research and development areas are:

- Autonomous flying
- Mobility
- Road Safety
- Self-docking and charging
- Collaborative Transportation

Blockchain for Applications in Robotics

Blockchain is the most promising technology with maximum conviction as, the next upcoming up-gradation of system interactions in cyber-physical systems. Blockchain is a shared, immutable ledger with timestamps to process recording transactions and more. The future of retail is based, on more peer-to-peer and human to machine-based transactions. Some of the key areas of research and innovation for this theme are not limited to:

- Robotics/Cobotics
- AI
- Healthcare and healthcare records
- Education and development
- Game theory
- Human-machine transactions
- Immutable ledgers for drone inspections
- Zero-Knowledge proofs and ZK rollups
- Swarming
- More resistant to hacking
- Energy consumption and charging records



I-Hub Foundation for Cobotics (IHFC), TIH IIT Delhi



APPLICATION PROCEDURE

Who can Apply?

- Indian Industries/Start-ups; Indian Faculty members/ Scientists/ Engineers/ Technologists from reputed academic institutions; R&D institutions/ laboratories

Project Duration & Expected Outcomes

- Initially for 1 year and extendable up to 3 years based on the milestone achievement/progress of the project
- Ideas translated into products/solutions are expected as the outcome of the project.

Guidelines and Format to Submit the Proposal [[Click here](#)]

- Please submit the proposal in PDF via online using the following link [[Click here](#)]
- **For any further information, please contact:** contact@ihfc.co.in