I-DAPT-HUB FOUNDATION @ IIT (BHU) Varanasi

Call for Innovative and Entrepreneurial Project Proposals
Under
Technology Incubation Hub (TIH) of National Mission on Interdisciplinary Cyber Physical Systems (NMICPS) for
Data Analytics and Predictive Technologies

Preamble

Interdisciplinary Data Analytics and Predictive Technology (I-DAPT) at IIT (BHU) under Technology Incubation Hub (TIH) targets to leverage Research and Engineering capabilities of Sustainable Development Goal 7 and achieve the mandate of National Mission on Interdisciplinary Cyber Physical Systems. The I-DAPT at IIT (BHU) promotes progression of Technology Readiness Level (TRL) for development of indigenous system mainly in five domain areas, i.e. Telecommunication, Power, Defense Research and Development, Road Transport and Highways, and Health and Family Welfare. The I-DAPT at IIT (BHU) also encourages to leverage other related areas for technology development, innovation, professional education, entrepreneurship, brand building, technology commercialization and product management for the dissemination and deployment of intellectual property; and for public outreach. At IIT (BHU), I-DAPT under TIH acts as a Section 8 Companyto spearhead the activities in "Data Analytics and Predictive Technologies" and other related areas under TIH.

Proposal Call

I-DAPT-HUB FOUNDATION at IIT (BHU) under Technology Incubation Hub (TIH) of National Mission on Interdisciplinary Cyber Physical Systems (NMICPS) is inviting project proposals for multidisciplinary program on **Data Analytics & Predictive Technology (DAPT).** A critical aspect is that the DAPT project proposals should formulate methodologies **(above TLR readiness levels 5)** for (i) concrete development of technologies, products, IPRs, as well as research bases and (ii) Entrepreneurship Development, including Start-ups and Spin-off companies, along with significant employment generation, techno-commercial incubation and innovation acceleration. The proposals are invited under following sub-themes of **five areas (A to E):**

A. **Telecommunications**
B. **Power**
C. **Defence Research and Development**

D. Road Transport and Highways
E. Health and Family Welfare

Some indicative/directed areas are given below, however, the investigators may also choose any other related areas.

A. Telecommunications: The proposal must be in the following (or related) sub-themes leveraging Design, Applications & Use Cases for DAPT in the next generation telecommunication paradigm:

i. Industry 4.0 – 5G Hyper-connection Air Interfaces
ii. Time Sensitive Networking (TSN)
iii. Hyperconverged - Multi-access Edge Computing (MEC)
iv. Software Defined Networks (SDN) and Network Function Virtualization (NFV)
v. Ultra-Reliable Low-Latency Communication (URLLC)
vi. Deterministic Networks for Critical Infrastructure Supervisory Control
vii. Massive Machine Type Communications (mMTC): M2M/ V2V/ V2I Communication
viii. Low Power Wide Area Technologies (LPWA) including NB-IoT enhancements and alike
ix. Smart City Command and Control Center – Optimal Design and Performance Test
x. Intelligent Sensors and Systems

B. Power: The proposal must be in the following (or related) sub-themes:

i. Mix Energy Source Renewable Integration in Sustainable Smart Power Grid.
ii. Solar PV Integrated DAPT Driven IoT Based E-Vehicle Charging Infrastructure.
iii. Data Analytics and Predictive Technology based Multidirectional Power Management for Smart Homes.
iv. Environmental Prediction Model for IoT Based Smart Agriculture.
v. Optimization and Power Management of Energy Storage System.
vi. Wireless Power Transfer and Energy Harvesting.
vii. High Power Density High Efficiency Hybrid Processor Technology.
viii. Smart Power Grid Infrastructure with Cyber Security.
ix. Power Quality in Standalone and Grid Tied System.
x. DAPT based IoT Enabled Demand Response Management in Distribution System.
xi. Power Optimization in Smart Microgrid Infrastructure.
xii. Reconfigurable Power Processors for Variable Futuristic Loads.

C. Defence Research and Development: The proposal must be in the following (or related) sub-themes:

i. Role of drones and radars for border and under water surveillance.

ii. Microwave techniques for imaging including object detecting radars

iii. Stealth technique based on advanced polymer composites

iv. Battery for remote areas in defense.

v. Explosive detection

vi. Smart sensors for soldiers (Air, Water and health)

vii. Biosensors to know the readiness of soldiers

viii. 5G for defence communications

ix. Advance Polymer Composites for defence applications.

x. Data analysis and predictive technology related to defence.

xi. Supply chain (medicine, food, goods etc.) in defence.

D. Road Transport and Highways: The proposal must be in the following (or related) sub-themes:

i. Development of pavement monitoring and management system

ii. Development of low-cost crash prediction and warning system

iii. Development of prototype connected vehicle testbed

iv. Development of pedestrian navigation and mapping system

v. On-road pavement distress monitoring and prediction system

vi. Low cost sensors for on-road vehicular emissions monitoring

vii. Travel behaviour and demand prediction during a pandemic

viii. Development of regional parking demand prediction and management system

ix. Models/algorithms/strategies to reduce air pollution and carbon footprint using Intelligent Transportation Systems

x. Dynamic road user charges/toll and their economic impact

E. Health and Family Welfare: Proposal must be in following (or related). sub-themes:

i. Forecasting and Prognostics

ii. Disease Prevention

iii. Rehabilitation

iv. Screening or Diagnosis

v. Therapy or Treatment

vi. Family Welfare

vii. Brain/Mind Health.

Project Format:

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Under
Technology Incubation Hub (TIH) of National Mission on Interdisciplinary Cyber Physical Systems (NMICPS) for
Data Analytics and Predictive Technologies (DAPT)

Project Ref No. _____
(to be given by office)

1. AreaCode (Please tick √ the appropriate box and also write sub theme):

1.	**Telecommunications**	
2.	**Power**	
3.	**Defence Research and Development**	
4.	**Road Transport and Highways**	
5.	**Health and Family Welfare**	

Sub theme (as per the advertisment):

2. Title of the Project :

3. Project Category: Category A /Category B (Pl. refer Pt 16)

3.b Proposed Duration of the Project: _____ Months

4. Principal Investigator (PI)

Name	
Designation	
Department	
Institution	
Postal Address	
E-mail	
Date of Birth :	

4b. Co-Principal Investigator (Co-PIs)

Name	
Designation	
Department	
Institution	
Postal Address	
E-mail	
Date of Birth :	

4c. Industry Collaboration

5. Ongoing / Completed Projects with the Principal Investigator :

S. No.	Project Title	Sponsoring Agency	Budget Rs (approx)	Status
1				
2				
3				

6. Project Summary (Maximum of 2 pages):

7. Objective (Bullet form):

8. Review of status of Research and Development in the subject (Maximum of 2 pages)

8.1. Importance of the proposed project in the context of current status (Maximum 1 page) (Highlight what is the new area or gap which will be solved in the project in relating to what is already known. This is a very important section to project the novelty content of the proposal)

9. Work Plan:

9.1 Methodology: (Maximum of 5 pages) (It should contain all the details of how each of the objectives will be addressed. This section must be detailed and have clear plans, not vague and generalized statements. It should have several schemes, tables, figures, equations etc. in addition to text, explanation and justification of why the project research plan will work)

9.2 Time Schedule of activities giving milestones through BAR diagram.

9.3 Suggested Plan of action for utilization of research outcome expected from the project. (Maximum 1 page)

10. Deliverables:

10.a: Technologies, products, IPRs,

10.b: Any other Research output

10.c: Entrepreneurship Development/ techno-commercial incubation

10.d: Start-ups and Spin-off companies

10.e: Employment generation

11. Risk analysis. (Maximum ½ page)

12. Budget:

Head	First Year	Second Year	Third Year	Total Grant (in INR only)	Justification
Manpower					
Consumables					
Travel					
Equipment (Minor) Indigenous only					
Contingencies					
Other cost:					
Overhead (10%)					
Total					

13. Expertise:

13.1 Expertise available with the investigators in executing the project: (Maximum 1 page) (Professional expertise existing with each of the investigators in terms of publications, Patents and preliminary results, to execute every component of the proposal should be highlighted)

13.2 Key publications (Full Reference with Impact Factor) and Patents (IPR) of the Investigators pertaining to the theme of the proposal during the last 10 years

14.1 Infrastructural Facilities available with PI

14.2 Equipment available with the Institute/ Group/ Department/ for the project:

(Related to this project)

15. Endorsement letter from the PI and Co-PIs Institute (PL. use DST/SERB format)

16. Duration:

Category A	One year with maximum budget of 10 Lakhs The project may be considered for extension for second year with additional fund
Category B	Two years with maximum budget of 20 Lakhs

Eligibility:

Applicants [Principal Investigator (PI) and Co-Principal Investigator(s) (Co-PI(s))] should be Indian citizens. Foreign nationals (including OCI and NRI) are also eligible to apply provided they fulfil the eligibility criteria notified by SERB (SERB Funding Guidelines for foreign nationals dated 27th Oct 2016).

The applicant(s) must hold a regular academic/research position in a recognized academic institution or

national laboratory or in any other recognized R&D institution in India.

Industry participation is mandatory.

The program is maximum for two years with deliverable from 1st year onwards. The investigators may be permitted to use the facility of IIT (BHU) Varanasi as per the Institute terms and conditions.

The project proposal can be submitted online, at any time, in the format as provided on website idapthub.org. Projects completed in all respects and as per the format, will be reviewed in the subsequent meetings for the project evaluation.

For any queries contact **cpstc.idapt@itbhu.ac.in.**