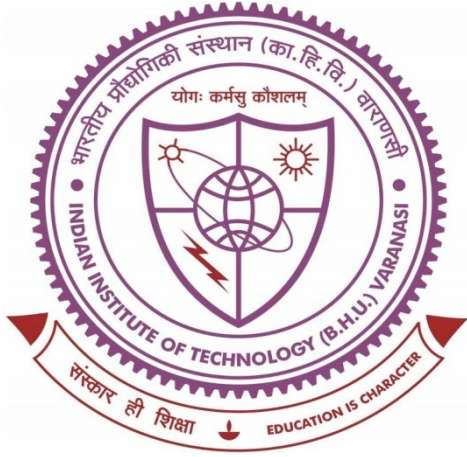


भारतीय  
प्रौद्योगिकी  
संस्थान  
काशी हिन्दू विश्वविद्यालय

**IIT**

INDIAN  
INSTITUTE OF  
TECHNOLOGY  
BANARAS HINDU UNIVERSITY



# IDAPT HUB FOUNDATION IIT (BHU) VARANASI

Under the aegis of  
NM-ICPS, DST, Govt. of India



# Overview

I-DAPT- HUB FOUNDATION is a non-profit initiative at IIT (BHU) Varanasi acting as a nodal center and a Technology Innovation Hub (TIH) for technology development and entrepreneurial activities in “Data Analytics and Predictive Technologies (DAPT)” and other related areas under **National Mission on Interdisciplinary Cyber Physical Systems (NMICPS), DST, Govt. of India.**

**The broader scope of this mission is to promote:**

- Translational Research and Technology Development,
- Establishment of Centers of Excellence,
- Human Resource Development & Skill Development,
- Innovation, Entrepreneurship & Start-up Ecosystem and
- International linkages & collaborations in Research

**I-DAPT-HUB FOUNDATION will collaborate with NSF in following thrust areas-**

- Telecommunications
- Power
- Road Transport and Highways
- Health and Family Welfare

# Mission and Vision

## Mission

- The Mission is to support translational research and innovation in the identified thrust areas leading to the development of DAPT technologies and applications.
- To will support centers of Excellence (CoEs) in academic and research institutions across the country, in association with the industrial and financial sector, with significant economic and technical collaborations.
- To develop enterprise grade prototypes and proofs-of-concepts (PoC) following internationally standardized norms (e.g. IEEE, E.U.-ESO, FDA and others) and translate them into commercial products, in conjunction with industry and start-ups leading to significant job creation and economic growth, across the country and the globe.

## Vision

The activities envisioned under this mission will provide a great fillip to societal betterment, via the development of new protocols, inventions of novel products/processes and services. The endeavor will also catalyse the creation of skilled young engineers, researchers, technicians, and entrepreneurs, together with human resource development at all levels, besides become a key contributor to realizing the vision of “Digital India”, “Innovate in India”, and “Make in India”.

# Activities (Research Projects, Publications, Patents, Grand Challenges, Short-term courses etc. )

## Research Projects

- Prediction of Dose-Volume Histograms of Organs-at-risk in Prostate Cancer Radiation Therapy using Machine Learning.
- Development of a scalable volatile organic compound (VOC) sensing based intelligent cyber physical system for near real-time vehicular pollution monitoring and recommendation for reduced emissions.
- Demonstrable Prototype of IoT enabled DC/AC Smart Grid at Library Building, IIT (BHU) Varanasi with Solar Photovoltaic Integration
- Data-driven battery sizing for standalone solar electric drive system for river boats
- Integrated computational and experimental studies to potential therapy of kala-azar targeting Dephosphocoenzyme A Kinase (LdDPCK) of the pathogen as a target

# Publications

Sl. No.	Title of Publication	Authors	Published In
1.	Modified Transformerless Boost Derived Hybrid Converter with No Right Half-Plane Zero and Reduced Leakage Current	Simant Kumar Samal, R.K.Singh, and Ranjeet Mahanty	IEEE Applied Power Electronics Conference 2022, Houston, Texas, USA
2.	Minimum Phase Hybrid Bipolar Converter for PV Integrated DC Microgrid Applications	Pawan Kumar, R.K.Singh, and Ranjeet Mahanty	IEEE Applied Power Electronics Conference 2022, Houston, Texas, USA
3.	MPPT based Performance Analysis of Minimum Phase Multi-Output Hybrid Bipolar Converter	Pawan Kumar, R.K.Singh, and Ranjeet Mahanty	IEEE Applied Power Electronics Conference 2022, Houston, Texas, USA
4.	An Improved Proportional Resonant Controller for Current Harmonics Reduction and Power Ripples Mitigation of Self-Synchronized Grid-tied PV System Under Distorted Grid Voltages.	Manash Kumar Mishra and Vivek Nandan Lal	<u>IEEE Energy Conversion Congress and Exposition (ECCE)</u> , 2021, Vancouver, BC, Canada
5.	A Two-stage Standard On-Board Electric Vehicle Charger with Minimum Switch Count.	Soumya Ranjan Meher and R.K.Singh,	<u>IEEE Energy Conversion Congress and Exposition (ECCE)</u> , 2021, Vancouver, BC, Canada
6.	Analysis of Maximum Power Point Tracking in four different modes for Multioutput Hybrid Bipolar Converter	Nidhi Malhotra, Pawan Kumar and R.K.Singh,	<u>IEEE Energy Conversion Congress and Exposition (ECCE)</u> , 2021, Vancouver, BC, Canada
7.	Multi Output Hybrid Solar Inverter with no Right Half Plane Zero and Reduced Common Mode Leakage Current	Simant Kumar Samal, R.K.Singh, and Ranjeet Mahanty	<u>IEEE Industry Applications Society Annual Meeting</u> , 2021, Vancouver, BC, Canada
8.	An Advanced Proportional Multiresonant Controller for Enhanced Harmonic Compensation with Power Ripple Mitigation of Grid-Integrated PV Systems Under Distorted Grid Voltage Conditions	Manash Kumar Mishra and Vivek Nandan Lal	<u>IEEE Transactions on Industry Applications</u> ( Volume: 57, <u>Issue: 5</u> , Sept.-Oct. 2021)

9.	Potential alternatives to current cholinesterase inhibitors: An in silico drug repurposing approach. Drug Development and Industrial Pharmacy	Debanjan Kundu and Vikash Kumar Dubey	<a href="https://doi.org/10.1080/03639045.2021.1952216">https://doi.org/10.1080/03639045.2021.1952216</a> Publisher: Taylor and Francis
10.	Identification of high affinity and low molecular alternatives of boceprevir against SARS-CoV-2 main protease: a virtual screening approach	Subhomoi Borkotoky, Manidipa Banerjee, Gyan Prakash Modi, Vikash Kumar Dubey	Chemical Physics Letters <a href="https://doi.org/10.1016/j.cplett.2021.138446">https://doi.org/10.1016/j.cplett.2021.138446</a>
11.	Repurposing of FDA-approved drugs as Autophagy Inhibitors in tumor Cells Journal of Biomolecular Structure and Dynamics	Kumari Prerna and Vikash Kumar Dubey	<a href="https://doi.org/10.1080/07391102.2021.1873862">https://doi.org/10.1080/07391102.2021.1873862</a> Publisher: Taylor and Francis].

## Patent

Indian Patent entitled "Adaptive Optimal Power Management Technique for Renewable Based Mix Energy System" Application No.: 202111031286

Inventors: Dr. R. K. Singh and Priyatosh Jena, Department of Electrical Engineering, IIT (BHU)

Status: Published

# Overall Accomplishments



## Short Term Courses

### KEY SPEAKERS



**Suhas Mansingh**  
VP (Engineering),  
Cisco Systems



**Prof. Shiho Kim**  
Director  
Yonsei Institute of Convergence  
technology, South Korea



**Prashant Anand**  
Distinguished Engineer  
NGN, Cisco Systems



**Laxmi Mukund**  
Distinguished Engineer  
NGN, Cisco Systems



**Raghu Kulkarni**  
Technical Leader  
Security, Cisco Systems



**Prof. Dhananay Singh**  
CTO, Vestella Inc.  
Hankuk University of Foreign  
Studies (HUFS), Seoul, South Korea

6 more distinguished speakers are scheduled.

### Next Generation Networks (NGN) & AI for Data Analytics and Predictive Technology Applications

**(NGN & AI for DAPT)**

One Week  
Online Short-term Course  
With live hands-on  
(March 22-27, 2021)

Hosted by



in support with



TLC  
IIT (BHU) and  
PANDIT M ADAN OHAN ALAVIYA  
NATIONAL MISSION ON  
TEACHERS AND TEACHING

**A TECHNOLOGICAL INNOVATION HUB ON  
INTERDISCIPLINARY DATA ANALYTICS AND  
PREDICTIVE TECHNOLOGY  
(IDAPT)**

Short Term Course on  
Data Analytics and  
Predictive Technology driven  
IoT based Smart Grid  
Infrastructure

**A TECHNOLOGY INNOVATION HUB  
ON  
INTERDISCIPLINARY DATA ANALYTICS  
AND PREDICTIVE TECHNOLOGY  
(IDAPT)**  
Under  
**NATIONAL MISSION ON INTERDISCIPLINARY  
CYBER PHYSICAL SYSTEM (NM-ICPS)**

1<sup>st</sup>-6<sup>th</sup> March 2021

Coordinator:- Dr. R. K. Singh  
Co-Coordinator:- Dr. V. N. Lal

One Week Short Term Course  
On  
**Data Analytics and  
Predictive Technologies**  
05-10 July 2021

DEFENCE POWER  
SKILL **DATA ANALYTICS AND  
PREDICTIVE TECHNOLOGIES**  
TELECOMMUNICATIONS  
TRANSPORT HEALTH

SUPPORTED BY  
DSTO


**A TECHNOLOGICAL INNOVATION HUB ON  
INTERDISCIPLINARY DATA ANALYTICS AND  
PREDICTIVE TECHNOLOGY (IDAPT)**

# Short Term Courses

**Short Term Course on**  
 Data Analytics and Predictive Techniques for Urban Freight Transportation System (FTS)

**Short Term Course on**  
 Advanced Techniques for Traffic Data Analysis, Visualization and State Estimation for Indian Cities


**A TECHNOLOGY INNOVATION HUB ON INTERDISCIPLINARY DATA ANALYTICS AND PREDICTIVE TECHNOLOGY (IDAPT) Under NATIONAL MISSION ON INTERDISCIPLINARY CYBER PHYSICAL SYSTEM (NM-ICPS)**



11<sup>th</sup> –14<sup>th</sup> November

Coordinators:- Dr. S Pratap  
 Dr. Lakshay

**A TECHNOLOGY INNOVATION HUB ON INTERDISCIPLINARY DATA ANALYTICS AND PREDICTIVE TECHNOLOGY (IDAPT) Under NATIONAL MISSION ON INTERDISCIPLINARY CYBER PHYSICAL SYSTEM (NM-ICPS)**



21<sup>st</sup> –26<sup>th</sup> October 2021


Coordinators:- Dr. Ankit Gupta  
 Dr. Anilkumar Bachu

**Data Collection and Analytics in Pavement Management Systems**

Online Short-term Course

March 01-05, 2021


At



CELEBRATING CENTENARY  
**100** years  
 IIT (BHU) VARANASI

Supported by

**A TECHNOLOGICAL INNOVATION HUB ON INTERDISCIPLINARY DATA ANALYTICS AND PREDICTIVE TECHNOLOGY (IDAPT)**



विज्ञान एवं प्रौद्योगिकी विभाग  
 DEPARTMENT OF SCIENCE & TECHNOLOGY

**Data Analytics and Predictive Technology for Intelligent Transportation Systems (DAPT-ITS)**

Online Short-term Course

March 15-19, 2021

Hosted by



CELEBRATING CENTENARY  
**100** years  
 IIT (BHU) VARANASI

Supported by

**A TECHNOLOGICAL INNOVATION HUB ON INTERDISCIPLINARY DATA ANALYTICS AND PREDICTIVE TECHNOLOGY (IDAPT)**



# Short Term Courses



Indian Institute of Technology (IIT) BHU

presents  
online webinar on

## BIO STARTUPS

The journey from idea to reality

Saturday,  
4th September, 2021  
2:30 P.M. IST

- How to start a biotech company?
- Challenges with Startup
- Projected Growth in Biotech Sector



**National Conference on  
Computational and Biochemical  
Drug Discovery  
[NCCBDD-2021]**

**September 11-12, 2021**

Online conference jointly organized by

**I-DAPT HUB FOUNDATION IIT (BHU),  
VARANASI**  
(A Section 8 - Not for profit Company)

भारतीय प्रौद्योगिकी संस्थान IIT INDIAN INSTITUTE OF TECHNOLOGY BANARAS HINDU UNIVERSITY

and



**Bioinformatics and  
Drug Discovery Society**


**Organizing Chairman  
Prof. Vikash Kumar Dubey,  
IIT (BHU) Varanasi**

**Computer Aided Drug Design and  
Protein Analysis**

**Online Short-term Course**

**February 22-26, 2021**


At



CELEBRATING CENTENARY  
**100**  
IIT (BHU) VARANASI

Supported by

**A TECHNOLOGICAL INNOVATION HUB  
ON  
INTERDISCIPLINARY DATA ANALYTICS AND  
PREDICTIVE TECHNOLOGY  
(IDAPT)**



DEPARTMENT OF  
SCIENCE & TECHNOLOGY

**Advances in  
Medical Imaging**

**Online Short-term Course**

**March 15-19, 2021**  
At IIT (BHU), Varanasi



CELEBRATING CENTENARY  
**100**  
years  
IIT (BHU) VARANASI

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ON  
INTER-DISCIPLINARY DATA ANALYTICS  
&  
PREDICTIVE TECHNOLOGY  
(IDAPT)**

Sponsored by

**Dept. of Science & Technology,  
Ministry of Science & Technology,  
Govt. of India**

# Short Term Courses

**Industrial Conclave - 2021, IIT-BHU**  
**Industry Institute Interaction**



**10th Sept., 2021**

**About the Institute**  
Indian Institute of Technology (IIT) Varanasi is a public engineering institution located in Varanasi, Uttar Pradesh, India. Founded in 1959 as the Banarus Engineering College, it became the Institute of Technology, Banarus-Hindu University in 1968. It was designated as Indian Institute of Technology (IIT) in 2002. IIT(BHU) is committed to imparting quality education using modern teaching methods and by designing curriculum that is abreast with latest technological advancements in the industry. The institute continually pursues to solve complex societal problem and to support the nation in its march towards technological advancement. The institute is steadfast and resolute in creating an environment aimed at learning and development of students, faculty and staff alike.

**Industrial Conclave**  
To surge ahead in this world of cut throat competition, one needs to have a proper blend of technical skills and managerial skills. To achieve this, IIT-BHU has organized this Industrial Conclave 2021, where several renowned industries are invited to strengthen the alliance between academics and industries. The conclave will provide a forum for industry professionals, academicians, faculties and research scholars to interact and exchange their thoughts and perspectives on industry-relevant technological advancements at ground level.  
We are delighted to welcome you to attend this Conclave on 10th September 2021 and partake in the proceedings.



**In association with**











Varanasi, IIT BHU

**Short Term Course on**  
**Advanced Techniques for**  
**Traffic Data Analysis,**  
**Visualization and State**  
**Estimation for Indian Cities**

**A TECHNOLOGY INNOVATION HUB**  
**ON**  
**INTERDISCIPLINARY DATA ANALYTICS**  
**AND PREDICTIVE TECHNOLOGY**  
**(IDAPT)**  
**Under**  
**NATIONAL MISSION ON INTERDISCIPLINARY**  
**CYBER PHYSICAL SYSTEM (NM-ICPS)**



**20<sup>th</sup> –24<sup>th</sup> December 2021**

**Coordinators:**  
**Dr. Ankit Gupta**  
**Dr. Anilkumar Bachu**  
**Dr. Agnivesh Pani**

**Short Term Course on**  
**Data Analytics and Predictive**  
**Techniques for Urban Freight Trans-**  
**portation System (FTS)**

**A TECHNOLOGY INNOVATION HUB**  
**ON**  
**INTERDISCIPLINARY DATA ANALYTICS**  
**AND PREDICTIVE TECHNOLOGY**  
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**NATIONAL MISSION ON INTERDISCIPLINARY**  
**CYBER PHYSICAL SYSTEM (NM-ICPS)**



**10<sup>th</sup> –14<sup>th</sup> November**

**Coordinators:- Dr. S Pratap**  
**Dr. Lakshay**

# Collaborations

S. No.	First Party	Second Party	Date of Signing	Activities
1	I-DAPT-HUB FOUNDATION	Hughes Global Education India Private Limited	07-01-2021	Online training courses on AI
2	I-DAPT-HUB FOUNDATION	HDFC Bank Ltd.	15-01-2021	Vernacular and affordable learning platform for school students. 360-degrees tech and touch model named UDYAMITA to fosters rapid creation and development of nano/micro-entrepreneurs in the low-income/reverse-migrants/unemployed segment population
3	I-DAPT-HUB FOUNDATION	The Technology Innovation Hub at Indian Statistical Institute, Kolkata	21-06-2021	Joint activities such as seminars, workshops, conferences and training programmes etc. Undertaking collaborative research activities through participation in nationally and internationally funded projects
4	I-DAPT-HUB FOUNDATION	OPAL-RT TECHNOLOGIES INDIA PVT. LTD	08-10-2021	Development of test beds for various thrust areas Cloud based solution for power system studies and research. Development of digital twin technology.
5	I-DAPT-HUB FOUNDATION	Premas Biotech Pvt. Ltd	06-12-2021	Collaboration related to Biomaterial and tissue scaffold products, biomedical devices, support for vaccine and drug discovery products

- Jointly organizing **13th International Conference on Computing, Communication and Networking Technologies** with University of South Alabama, USA between July 10-12, 2022.

# I-DAPT-HUB Grand Challenge

I-DAPT HUB Foundation will conduct I-DAPT-HUB Pitch challenge for startups, entrepreneurs and Innovators developing cutting-edge/Innovative technologies in **Power, Telecommunications, Defense research & development, Road transport and Highways, Health & Family welfare sectors.**



**I-DAPT HUB FOUNDATION  
IIT (BHU) VARANASI**

inviting startups/innovators/researchers  
for  
**I-DAPT HUB PITCH  
CHALLENGE**

Under the aegis of  
**NM-ICPS**  
(DST, Govt. of India)

I-DAPT HUB FOUNDATION  
is inviting all  
startups/innovators/researchers involved  
in Thrust areas -

- Power
- Defense
- Telecommunications
- Road transport and Highways
- Health and Family welfare

for the Grand Pitch event.

All interested startups/innovators should  
primarily include  
**Data Analytics &  
Predictive Technology**  
as their backbone technology

The detailed list of sub-areas are given on  
the next pages

**Important Dates**

- Applications for the 1st round will  
be accepted from **7th Feb-28th  
Feb, 2022**
- Result of 1st Round will be  
declared on **15th March, 2022**

**INR 50,000**  
For the winners in each  
thrust area.

**INR 20,000**  
For the 1st runner ups  
in each thrust area.

**INR 10,000**  
For the 2nd runner ups  
in each thrust area.

CASH PRIZES AND  
CERTIFICATES FOR  
THE WINNERS  
+  
INCUBATION  
OPPORTUNITIES



(Scan here for registration)

MANAGER.IDAPT@IITBHU.AC.IN  
WWW.IDAPTHUB.ORG

Logos: IIT BHU, DST, Department of Science & Technology, I-DAPT HUB

# Key Research Personnel

## Telecommunications



**Dr. N. S. Rajput**  
Associate Professor in  
Electronics Engineering  
IIT (BHU), Varanasi

<https://iitbhu.ac.in/dept/ece/people/nsrajputece>

## Power

**Dr. R. K. Singh**  
Associate Professor in  
Electrical Engineering  
IIT (BHU), Varanasi

<https://www.iitbhu.ac.in/dept/eee/people/rksingheee>



## Defense Research and Development



**Prof. Rajiv Prakash**  
School of Material Sc. &  
Technology  
IIT (BHU), Varanasi

<https://iitbhu.ac.in/dept/mst/people/rprakashmst>

## Road Transport and Highways

**Dr. Ankit Gupta**  
Associate Professor  
Department of Civil  
Engineering  
IIT (BHU), Varanasi

<https://www.iitbhu.ac.in/dept/civ/people/ankitciv>



## Health and Family Welfare



**Prof Prasun Kumar Roy**

School of Biomedical  
Engineering

<https://www.iitbhu.ac.in/dept/bme/people/pkroybme>

**Prof. V. K. Dubey**  
School of Biochemical  
Engineering  
IIT(BHU), Varanasi

<https://iitbhu.ac.in/dept/bce/people/vkdubeybce>



# Timeline, Plan for new research activities, and Milestones

SI no.	Activity/Milestone	1 <sup>st</sup> year				2 <sup>nd</sup> year				3 <sup>rd</sup> year				4 <sup>th</sup> Year				5 <sup>th</sup> Year			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A1	Data collection, Literature review, and Preliminary System design	■																			
A2	Simulation and paper design of planned prototype	■	■																		
A3	Laboratory prototype design and development		■	■	■	■	■														
A4	Expert Driven New Knowledge Generation /Discovery (TRL5)				■	■	■	■	■	■	■	■	■	■							
A5	Development of products/ prototypes from existing Knowledge (By experts or teams) (TRL6)				■	■	■	■	■	■	■	■	■	■	■	■	■				
A4	Technology /product delivery in specific sectors (TRL7)														■	■	■	■	■		
A5	Yearly review of progress					■				■				■				■			
A6	Mid Term Review																				
A8	Preparation and Publication of final progress reports**			■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

\*\*Draft completion report for review ( 3 month prior to date of completion )

# Priority Areas for new US India Collaborations

Data Analytics and Predictive Technologies (DAPT) is an emerging approach to produce transformative technologies and novel solutions for societal, national and global problems. The following are some of the generic technologies for which Indo-US collaboration will play a crucial role in development of DAPT:

- **System Design** – Understanding the Integration of Physical and embedded systems.
- **Communication** - Communication networks are an essential part of any DAPT as they interconnect the DAPT subsystems and components.
- **Security** – DAPT has been increasingly involved in fields ranging from aerospace, automobile, industrial process control, energy, healthcare, manufacturing and transportation, etc. where **secure operation** is one of the key concerns.
- **Privacy** - Understanding the impact of cyber-attacks on any **DAPT** and in the design and assessment of detection mechanisms.

These aforementioned technologies will be implemented for the Priority Thrust-areas identified by I-DAPT-HUB Foundation as -

- Telecommunications
- Power
- Road Transport and Highways
- Health and Family Welfare

## Telecommunications:

Industry 4.0 is driving the trends for digital transformation. Digital transformation is the change associated with the application of digital technology in all aspects of human society.

Since everything can be digitized, transformed, transported and stored, the ubiquitous telecommunication infrastructure will also need its transformation into digital infrastructure.

There are following enabling technology for which India-US may collaborate for this massive transformation:

- Industry 4.0 – 5G hyper connection and innovative Air Interface
- Massive scale Transport- Ethernet/IP, TSN.
- Low Latency computing at network scale e.g. MEC
- Massive “softwarization” where applications are, converging to IT methods e.g. Virtualization etc.

## Power/ Energy:

The India-US collaboration will undertake the technology development in Power/Energy using DAPT for environment friendly, smart home automation with the system of Internet of Things (IoT)-activated smart devices that can be controlled remotely. The activities envisioned under the DAPT will provide a great impetus to Smart Cities Mission in terms of environmentally friendly, reliable, efficient, and IoT activated optimum power generation/flow and thus, setting up a DAPT based smart grid for smart homes and cities.

The technological areas on which the research can be done for this work package are as follows:

- Mix Energy Source Renewable Integration in Sustainable Smart Power Grid.
- Power Optimization in Smart Microgrid Infrastructure
- DAPT Driven IoT Based E-Vehicle Charging Infrastructure.
- Smart reconfigurable house
- IoT enabled demand response management in Power distribution system

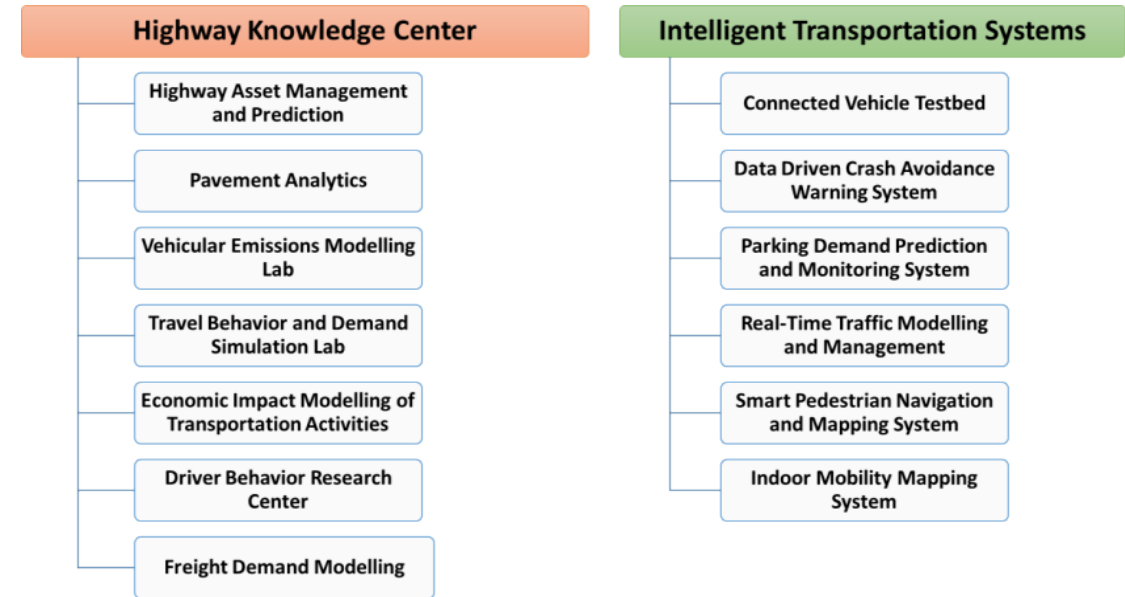


## Road Transport and Highways:

Transportation plays a vital role in transporting goods and services from one location to another in due estimated time. Smart mobility and transportation can be enhanced through data analytics and predictive technologies.

I-DAPT-HUB FOUNDATION proposes two major work plans where India-US researchers may collaborate –

1. Highway Knowledge Centre where a multitude of data would be collected, borrowed and fused together to support transportation decision making.
2. Intelligent Transportation Systems which includes testing relevant transportation algorithms and systems for real-time traffic management control system.



## Health and Family Welfare:

In the present day health management scenario, the advent of Medical Expert Systems and the International Collaborative Epidemiology Programs have demonstrated the very reliable validated ability of “Data Analytics & Predictive Technologies”. Thereby, one can enable:

- The automated forecasting of the most efficient therapy protocol, and
- Judicious selection and optimization of the most feasible therapeutic agents.
- IoT enabled biosensors and portable kits based health monitoring
- Sensors for air, water and food
- Data Analytics & Predictive Technologies in Population health monitoring

I-DAPT-HUB Foundation proposes the program of Brain/Mind Health for National Mission on DAPT focusing on harnessing these technologies for developing Neuro informatics Platforms for:

1. Development of tools and databases for management and sharing of neuroscience / psychometric data at all levels of analysis.
2. Construction of tools for analyzing and modelling neuroscience / cognitive data, in normality and disease.
3. Formulation of computational models of the human brain, its neuronal processes and cognitive / perceptual /subconscious operations

## **Keywords for Applications/Platforms:**

- Power/ Energy
- Telecommunications
- Road Transport and Highways
- Health and Family welfare
- Environment and Sensors/ Bio-Sensors

## **Keywords for Research Areas:**

- Power Electronic Interface
- Software-Defined Networking (SDN) and Fog Computing
- Neurocomputing
- Virtual Radio Access Networks (vRAN) for Hardware Abstraction
- Advance Polymer Composites
- Smart Grid Infrastructure
- Non Conventional Energy System
- Medical Devices