



# CELEBRATING

A Decade of Excellence

[October 22-23, 2019]



Global ICT Standardization Forum for India (GISFI)

[www.gisfi.org](http://www.gisfi.org)

*Celebrating 10 Years of Innovation Excellence  
2009 – 2019*





### बीआईटी जैसे और तकनीकी संस्थान खुलेंगे : मंत्री

एटा | संकट सूत्र

राज्य में बीआईटी जैसे तकनीकी शिक्षण संस्थान और खोलने जाएंगे। इस दिवस में राज्य सरकार की ओर से लगातार सकारण की जा रही है। लोक राज्य के प्रतिपारदर्शिता-उपज-उपज-उपज को अपने तकनीकी शिक्षण संस्थानों के लिए दूसरी राज्य परामर्श जारी करना पड़ेगा। राज्य में बीआईटी, राज्यwide लॉ यूनिवर्सिटी व भारतीय प्रबंधन संस्थान जैसे राष्ट्रीय स्तर के इंजीनियरिंग व मैनेजमेंट कॉलेज खोलने जा चुके हैं।

राज्य के मुख्यमंत्री तकनीकी शिक्षण के मंत्री प्रो. वि. वेंकटेश्वर राव ने सोमवार को बीआईटी एटा में आयोजित 'International Workshop On ICT Standardization for India' का उद्घाटन करते हुए संबोधित किया।

में वे ने भी विकास को रखा है। राज्य के प्रतिपारदर्शिता तकनीकी शिक्षण संस्थान बीआईटी में इस तरह के उदाहरण से राज्य की प्रगति बढ़ेगी। जीआईटीएल आई (मिसरा) के संस्थापक रावनी

प्रसाद ने कहा कि वह देश में सफल-सुचारु-प्रौद्योगिकी (आईआईटी) का प्रथम राष्ट्र है जो वैश्विक स्तर पर स्वीकार्य है। जीआईटीएल आई (मिसरा) के संस्थापक रावनी

है। मुख्यमंत्री संचालन के सचिव एस सिद्दार्थ ने कम्प्यूटर भाषा को महता के बारे में उल्लेख किया कि यह अत्यंत महत्त्व है कि विश्व में मानक बनाने का प्रयत्न हो रहा है। भारत में कम्प्यूटर भाषा को महता के बारे में उल्लेख किया कि यह अत्यंत महत्त्व है कि विश्व में मानक बनाने का प्रयत्न हो रहा है। भारत में कम्प्यूटर भाषा को महता के बारे में उल्लेख किया कि यह अत्यंत महत्त्व है कि विश्व में मानक बनाने का प्रयत्न हो रहा है।

### आइआईटी पटना में होगा 5जी पर शोध

केंद्रीय दूरसंचार मंत्री रविशंकर प्रसाद ने संस्थान को हर तरह की मदद का दिलाया भरोसा

आइआईटी पटना में 5जी पर शोध के लिए एक शोध केंद्र की शुरुआत हुई। केंद्रीय दूरसंचार मंत्री रविशंकर प्रसाद ने संस्थान को हर तरह की मदद का दिलाया भरोसा।

आइआईटी पटना में 5जी पर शोध के लिए एक शोध केंद्र की शुरुआत हुई। केंद्रीय दूरसंचार मंत्री रविशंकर प्रसाद ने संस्थान को हर तरह की मदद का दिलाया भरोसा।



# Proceedings for

A Decade Celebrations  
of

## Global ICT Standardization Forum for India (GISFI)

(October 22-23, 2019)

Organized by



Vishwaniketan iMEET, Navi Mumbai

Documented and Prepared by  
Dr. Dnyanesh S. Mantri

with the inspiration and support of Dr. Ashok Chandra



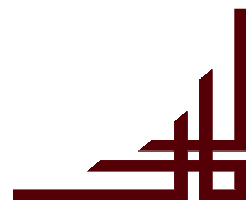
Disclaimer : This proceedings is based on the figures and facts available from different sources including GISFI and CGC, and does not claim any responsibility regarding statements.



# Contents



Sr. No.	Contents	Page Nos.
	Welcome Message by Chairman	01
1.1	Recognition of GISFI Letter	02
1.2	Introduction: Need of Indian Standards	03
1.3	GISFI Announcement and Concept Note	04
1.4	Thrust Areas in GISFI	05
1.5	Membership Details	07
1.6	MoUs and Collaborations	08
1.7	GISFI PhD Program	09
1.8	Participation of GISFI in Conferences	12
1.9	Details about GISFI Meetings	15
1.10	CTIF Global Capsule (CGC) and its role in GISFI	18
1.11	GISFI Initiatives on 5G	20
1.12	Association of Vishwaniketan with GISFI and CGC	21



## Welcome Message by Chairman



Prof. Ramjee Prasad

The Global ICT Standardization Forum for India (GISFI) is an Indian Pre-standardization body active in the area of Information and Communication Technologies (ICT) and related application areas, such as energy, telemedicine, wireless robotics, and biotechnology etc. GISFI is working with standard developments and research locally and internationally. GISFI plays an increasingly important role to create a new coherence and strengthen bonding between industry, research and academia to meet the ICT requirements not only in India but globally also. The working groups organized in GISFI are active in preparing standards in the ICT sector in collaboration with academia, industry and Government/policy-making circles. As a result more than 40 research scholars from different institutes and industry in India are awarded PhD.

GISFI has represented India globally and signed several MoUs with standardization body like ETSI, ITU etc. Also conducted several workshops and meetings in collaboration to promote the pre-standardization activity in India. To motivate young graduates, and strengthen R&D, GISFI organized several international conferences.

Further, GISFI alumni association will be formed during decade celebrations at Vishwaniketan on October 22, 2019. All PhDs, Post-doc researchers, Academicians and Industrial colleagues will be the members of GISFI alumni association. It will strengthen the GISFI to meet its objectives.

I am pleased to see that GISFI has made the quantum of progress over the period of time and its work is well recognized. In coming years GISFI will strategically play major role in Pre-standardization, Research, Innovations, Entrepreneur and generation of IPRs. The GISFI has taken initiative in R&D with the latest technology for example Human bond communication, CONASENSE and so on with the support of Core TeleInfrastructure (CTIF) Global Capsule (CGC).

GISFI is one of the arms of CGC and it will play a significant role for the growth of GISFI in coming years.

Prof. Ramjee Prasad  
Founding Chairman GISFI  
Founding President CGC

**“Come join us in our march towards Light”!**

## 1.1 Recognition of GISFI, July 9, 2010



हिन्दी का मान : राष्ट्र का सम्मान

Anuraag Kochar  
Director (IR II)  
Tel +91(11) 23715022  
Fax +91(11) 23372105

DO No. 21-1/2010-IR II Dated: 07.07.2010

Dear Sir,

Kindly refer to your letter addressed to Hon'ble MOC&IT Government of India, seeking recognition and approval of GISFI (Global ICT Standardization Forum for India).

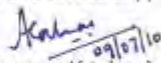
In this connection, I am directed to convey that:

- i) The Ministry of Communications &IT has no objection in setting up of GISFI in India subject to the condition the standards of ICT services/products formulated by GISFI in the interest of India be approved in advance by this Ministry before presenting the same to the international organizations.
- ii) The Forum is required to be registered under the relevant Acts with the office of Registrar for Society/Trust concerned.
- iii) Further, mode of engagement of DoT and its various technical arms such as TEC, C-DOT etc. so as to achieve synergic cooperation with GISFI in the area of ICT will subsequently be worked out.

We would request you to kindly send us necessary details such as copy of registration certificate, name and contact details of the office bearers of GISFI for further coordination in this regard at the earliest.

With kind regards,

Yours sincerely,

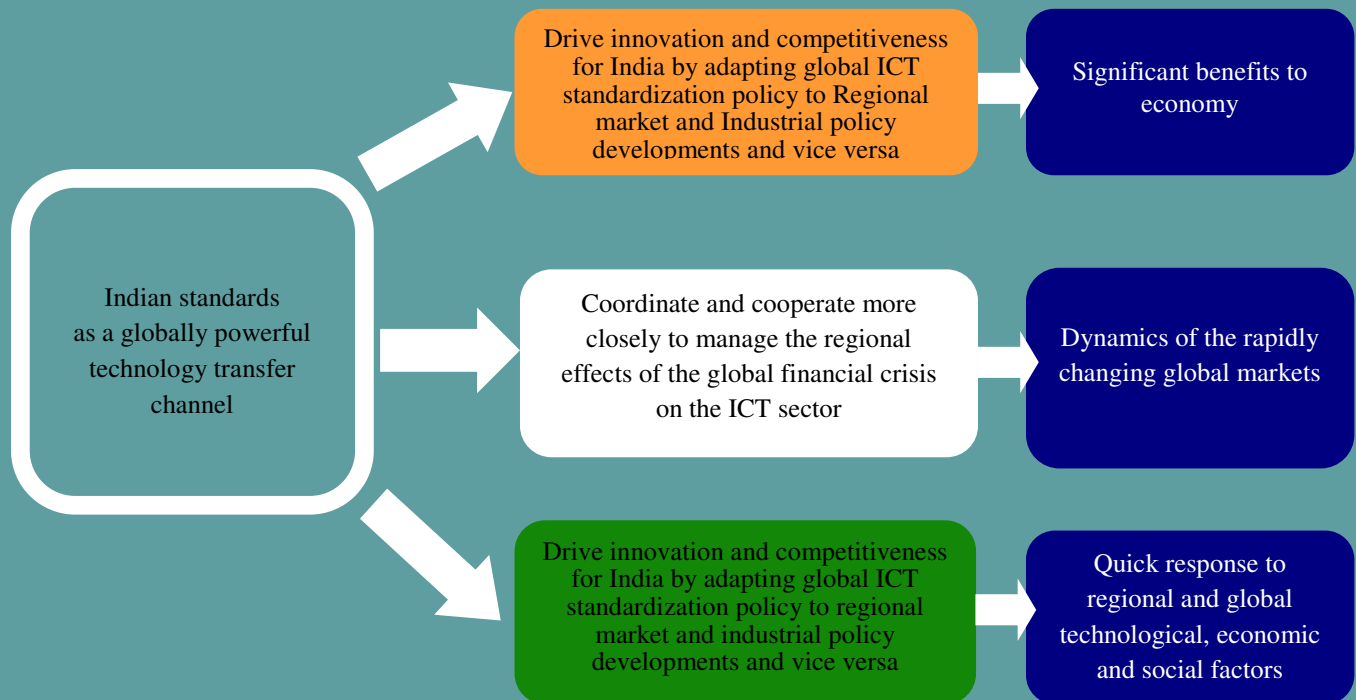
  
( Anuraag Kochar )

Prof. Dr. Ramjee Prasad  
Founding Chairman, GISFI

Director  
Centre for Teleinfrastruktur, CTIF  
Aalborg University  
Niels Jemes Vej 12- DK-9220 Aalborg,  
Denmark

## 1.2 Introduction

### Need for Indian Standards



GISFI addresses the research and product development of ICT in India and provides a bridge towards the globalization of the Indian achievements; the issues of technology, governance, and development; and a platform for raising an awareness of the importance and the internationalization of the higher education in the fields that are supported by the joint partnership with the Government of India. The Working Groups (WGs) organized in GISFI draw knowledge from academia, business, civil society, and Government/policy-making circles.

GISFI is a strong global platform to a successful standardization process that can benefit all user groups. The challenges and issues pertaining to research, technology, governance and product development are addressed by GISFI in support with the Government of India highlighting the importance and internationalization of higher education in various technical fields. The forum acquired eminent technical scholars, researchers, industry people, special interest groups and academicians in these years to build, support and shape up the goals set for the Indian technological market.

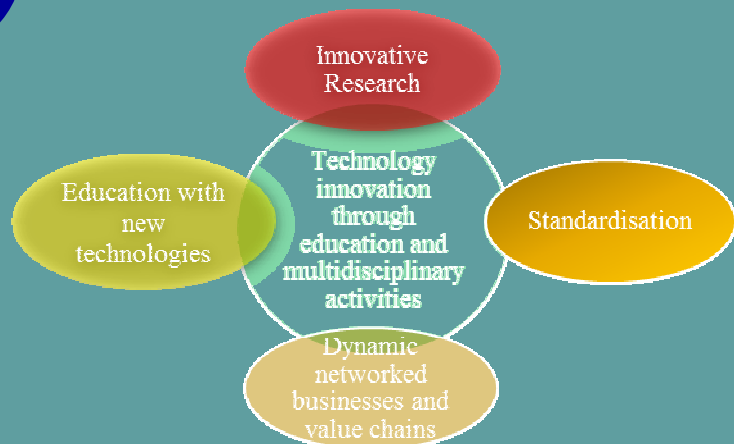
### The Bottom Line ...

India plays an increasingly important role in the process of research and development in the field of the communications technology and interdisciplinary areas. Thereupon, GISFI is an effort to create a new coherence in the world of standardization by strengthening the role of India in the world standardization process.

## 1.3 GISFI Announcement with Concept Note

GISFI Publically announced in Kolkata in December 2008, the first stride was made towards the newly conceived idea for launching an Indian standardization body of a highly international caliber. The formation of the Global ICT Standardization Forum for India (GISFI) was an annotation of a strong leap that India has taken towards attaining a faculty for standardization and IPRs.

The concept of a standardization body for India representing the nation in totality and in support of promoting a knowledge based economy, was conceived by Prof. Ramjee Prasad. Prof. Prasad proposed the matter to several major Indian companies, who shared in the concern that the lack of a unified Indian standardization effort leads to market fragmentation and inhibits the possibility for large investments, and thereby immediately declaring their unconditional support to join in the effort. During his participation in a meeting together with Korean, Japanese and Chinese companies and other organizations of the various countries, Prof. Prasad reflected this novel idea.



### GISFI encompasses the following activities:

- Drawing up provisions and requirements for the ICT standardization process to support the establishment of agreements,
- Give one or more solutions for a given problem and ensure a repeated use, and
- Provision for a basis for future research and product developments that can reach the global market.



## 1.4 Thrust Areas in GISFI

GISFI had outlined key future of ICT Technologies in the following Thrust Areas:



**Green ICT:** A key way to reduce carbon emissions and thus enable healthier life on the planet Earth is to introduce and more develop information and communication technologies to at least four proposed areas of human activity: smart grid, road transportation, smart buildings and travel substitution. The idea of the smart grid is to provide real-time information to end-users, grid operators and distributed generators. In this way everybody can accomplish the tasks with minimized emissions for the benefit of all. This can be accomplished by changing the grid network from point-to-node to point-to-point with the connection between end-users, by process automation using smart ICT-meters, and by creating a real-time marketplace for energy consumption by enabling two-way communication between customers and suppliers.

**Cloud and Service Oriented Networks:** Convergence in network technologies, services and in terminal equipment is at the basis of change in innovative offers and new business models in the communications sector. The utilization of the term “convergence” represents the shift from the traditional “vertical silos” architecture, i.e. a situation in which different services were provided through separate networks (mobile, fixed, CATV, IP), to a situation in which communication services will be accessed and used seamlessly across different networks and provided over multiple platforms, in an interactive way.

**Internet of Things (IoT):** The Internet of Things (IoT) describes a worldwide network of intercommunicating devices. It integrates the ubiquitous communications, pervasive computing, and ambient intelligence. At this point (IoT) must be seen as a vision where "things", especially everyday objects, such as nearly all home appliances but also furniture, clothes, vehicles, roads and smart materials, and more, are readable, recognizable, locatable, addressable and/or controllable via the Internet.

**Spectrum:** Wireless is being used so predominantly, now days, that there is hardly any walk of life, which does not use radio communication in one form or the other. It includes maritime, aeronautical, broadcasting, transport, oil & electricity sectors, public utility services, health & environment, public telecommunication services, internet, e-commerce, and so on and so forth. To cater for the gigantic demand on the spectrum, the world-over, it is essential that the spectrum be used efficiently, economically, rationally and optimally.

## Thrust Areas in GISFI

**Security and Privacy:** Plays an important role ICT communications. Currently the main focus is on telecom network security testing. This work item is based on Indian government requirements for security, testing of mobile networks and network elements. Other activities that have been discussed on and off are: Unsolicited communication, Cyber world and children, and Identity management. The usual stuff used to protection are: External protection using usual stuff: firewall Per device protection: authorization, authentication, logging, hardening, Interface, protection, Anti-virus, malware protection etc.

**Future Radio Networks:** Future Radio Networks Technologies are required to focus on providing Higher Data Rates, New Frequency Bands, Flexible Spectrum Usage and Energy Efficiency. Cognitive Radios are environment aware, self-reasoning and learning capable radios that can change the parameters or protocols depending on the environment in which they operate. Hence Cognitive Radio is very important technology for the future

### Achievements

- **Future Radio Group** is now working on 5G and beyond.
- **Security and Privacy Group** has provided its outputs to **TEC, DoT, TTSC** and initiated work on Cyber Security.
- **Green ICT Group** has provided its outputs to **TEC, DoT** for their Recommendations on ‘Approach toward Green Telecoms’. Meetings with TRAI held as well.
- **Cloud and SON Group** has provided its outputs to **TRAI** on “Emergency services.”
- **Internet of Things Group** has developed several use cases from which requirements and high level architecture are derived. Inputs have been provided to **TEC, DoT** and **ITU-T**.

### Research and Important Topics of Discussions

- |    |                                |    |   |
|----|--------------------------------|----|---|
| 1  | Green ICT                      | 2  | 5G and Beyond   |
| 3  | Cloud Computing                | 4  | Communication Navigation Sensing Services (CONASENSE) |
| 5  | Cognitive Radio Networks       | 6  | Internet of Things                                    |
| 7  | Security and Privacy           | 8  | Flexible Spectrum Usage and Energy Efficiency         |
| 9  | Digital India                  | 10 | Muti-Objective Routing                                |
| 11 | Smart City                     | 12 | Vehicular Adhoc Networks                              |
| 13 | Connectivity and Communication | 14 | Spectrum Sensing and Usages                           |
| 15 | Medium Access Controls         | 16 | Cooperative Communications                            |
| 17 | Synchronization Control        | 18 | Wireless Sensor Networks                              |
| 19 | e-Commerce                     | 20 | Identity Management                                   |
| 21 | Human Bond Communications      | 22 | e-Agriculture   |

- The working groups had developed several use cases from which requirements were derived and are available in several TRs.
- High level architecture is available as TS.
- Study was done on relation of various architectures including ETSI-M2M and One M2M.
- LS was sent to ITU.
- Input was provided to TEC, DoT.

“We welcome you to Experience the difference”!!

## 1.5 Membership Details

### 1.5.1: Membership Fees

Category	Joining Fees (INR)	Annual Subscription (INR)
Corporate-Premium	5,00,000	10,00,000
Corporate	3,00,000	5,00,000
Institutional	1,00,000	2,00,000
Annual fee for startup	0	25,000
Individual	0	2,000
Students	0	500

### 1.5.2: Details about the GISFI Members (From 2009 till 2015)

Corporate-Premium	Corporate	Institutional
NIKSUN	ERICSSON	WIP Labs Pvt. Ltd
NEC Corporation	TEJAS Networks	VNL
	MOTOROLA	IIT-Hyderabad
	TATA Consultancy Ltd.	IIIT-Allahabad
	HUAWEI	Sinhgad Technical Education Society, Pune
	NOKIA Siemens Networks	Rajiv Gandhi University of Knowledge Technology, Hyderabad
	VERISERVE	HMR Institute of Technology, New Delhi
	SAMSUNG	Birla Institute of Technology, Ranchi
	CISCO	Communication Multimedia and Infrastructure Association of India (CMAI)
	IHOT, Japan	Association of Competitive Telecomm Operators

Date	Member
November 10, 2009	Ericsson joins GISFI as a Corporate Member
February 1, 2010	Cellular Operators Association of India (COAI) becomes institutional member of GISFI
June 1, 2011	NSN joining GISFI as a Corporate Member
April 1, 2011	Huawei joins GISFI as Corporate Member
January 1, 2013	CISCO joins GISFI as Corporate Member
February 3, 2017	National Institute of Technology, Patna (NITP) has joined as a Member of GISFI. NITP will actively participate in the GISFI event.

## 1.6 MoUs and Collaborations

### 1.6.1. MoUs

1. GISFI established collaboration with the European Standards Telecommunications Institute (ETSI) on August 10, 2009.
2. GISFI signed letter of Agreement with Association of Radio Industries and Businesses (ARIB), Japan, October 15, 2009.
3. MoU was signed between AAU and IIIT-Allahabad on February 25, 2011. This MoU was signed by Prof. Finn Kjaersdam, President, Aalborg University (Denmark); Prof. Ramjee Prasad, Director, CTIF, Aalborg University; and Prof. M. D. Tiwari Director, Indian Institute of Information Technology, Allahabad.
4. MoU was signed with Rajiv Gandhi University of Knowledge Technologies (RGUKT), Hyderabad on February 27, 2011. This MoU is signed by Prof. R. V. RajaKumar, VC, RGUKT and Prof Ramjee Prasad, Director, CTIF, Aalborg University.
5. MoU was signed with Princeton University's School of Engineering and Applied Sciences on April 26, 2011. This MoU was signed by Prof. Finn Kjaersdam President, Aalborg University; Prof. Ramjee Prasad Director, CTIF, Aalborg University; Prof. H. Vincent Poor, Dean, School of Engineering and Applied Science, Princeton University; and Mr. Christopher Eisgruber Provost, Princeton University.
6. GISFI and TTC Japan signed a Letter of Intent ensuring collaboration between the two organisations on August 22, 2011.
7. GISFI - TIA signed a Letter of Intent on November 1, 2011.
8. GISFI was signed MoU with Yokosuka Research Park (YRP-<http://www.yrp.co.jp>), Japan on March 9, 2012.
9. GISFI had signed MoU with IETE on June 3, 2015 at New Delhi. <https://youtu.be/JQgn1cCXaT0>
10. GISFI had signed MoU with the Society on Communication, Navigation, Sensing and Services (CONASENSE) on May 3, 2016 in Amsterdam (The Netherlands).

### 1.6.2: Collaborations

ETSI strengthens collaboration with Global ICT Standardization Forum for India.

**Sophia Antipolis, March 24, 2015:** ETSI ([www.etsi.org](http://www.etsi.org)) and GISFI ([www.gisfi.org](http://www.gisfi.org)) had signed a MoU to align their work on development, promotion and education concerning ICT standardization in India. The agreement was signed at the ETSI General Assembly held on March 17-18, 2015 in ETSI, France. GISFI has well established itself in the Indian standardization landscape through its two branches: R&D/Education and Standardization in the area of Information and Communication Technologies (ICT).

*“With this agreement we intend to build a bridge between European and Indian ICT standards as ETSI is involved in various innovative areas beyond telecommunications”.*



MoU with RGUKT



Letter of Intent with ETSI



MoU with ETSI

**“Hard work is the Key of Success” !!!**

## 1.7 GISFI PhD Program: Announced on November 26, 2009

### 1.7.1: Details about PhD Program:

GISFI, the academic arm of **Center for TeleInfrastruktur (CTIF)** working as global Research & Development centre and had mandate to create Product/Technology development Engineers. They will conduct patent based research to evolve Indian technology for local and global requirements. These Engineers in future will create start-up companies for self-employment instead of being employed. The objective is to transform Indian Engineering education from theoretical approach to Project Based Learning (PBL).

- **Silent Features:**

1. 85% Scholarship to deserving candidates from Academia, Industry and Government.
2. PhD programmes in ICT, Computer Science, Mechanical, Electrical, Civil Engineering, Energy, Environment, and interdisciplinary areas etc., preference to research interests in 5G.
3. As Global exposure, international standards, flexible work schedules / European Credit Transfer System.
4. Admissions as per rigorous selection process of the host Universities abroad.
5. Strong network with R & D centres.

### 1.7.2: Year Wise List of Scholars Doctor of Philosophy (PhD)

	<b>Arpan Pal</b> has successfully defended his PhD thesis titled, “Novel applications for emerging markets using television as a Ubiquitous device” on April 2013 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Chief Scientist and Research Area Head, Embedded Systems and Robotics at TCS Research, Tata Consultancy Services (TCS) Kolkata, West Bengal, India.
	<b>Balamuralidhar P</b> has successfully defended his PhD thesis titled, “Cognitive Wireless Communications” on April 2013 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Principal Scientist & Head, TCS Innovation Labs, Bangalore at Tata Consultancy Services, Bengaluru, Karnataka, India.
	<b>Vandana M. Rohokale</b> has successfully defended his PhD thesis titled, “Energy Efficient Authentication and Authorization for Multi-node Cooperative Connectivity and Reliability” on September 9, 2013 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Professor in Department of E&TC at Sinhgad Institute of Technology and Sciences, Narhe, Pune.
	<b>Parikshit N. Mahalle</b> has successfully defended his PhD thesis titled, “Identity Management Framework for Internet of Things” on November 07, 2013 under the guidance of Prof. Neeli Rashmi Prasad, Aalborg University, Denmark. Working as Professor in Department of Computer Engineering at Smt. Kashibai Navale College of Engineering, Pune.
	<b>Kishor P. Patil</b> has successfully defended his PhD thesis titled, “Spectrum Utilization and Management in Cognitive Radio Networks” on November 11, 2013 under the guidance of Prof. Ramjee Prasad and Knud Erik Skouby, Aalborg University, Denmark. Working as Professor in Department of E&TC at Sinhgad Academy of Engineering, Pune.
	<b>P.S.M. Tripathi</b> has successfully defended his PhD thesis titled, “Radio Spectrum Management for Future Wireless Communication Services” on May 9, 2014 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working in Ministry of Communications, Government of India.
	<b>Dipashree M. Bhalerao</b> has successfully defended her PhD titled, “Internet of Things Heterogeneous Interoperable Network Architecture Design” on October 3, 2014 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Professor in the Department of E&TC at Sinhgad College of Engineering, Pune.

	<b>Rajarshi Sanyal</b> has successfully defended his PhD thesis titled, “Smart Multiple Access Topology Employing Intelligent Physical Layer for Addressing the Mobile Node” on November 19, 2014 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Telecommunication Network Architect at BICS (Belgacom International Carrier Services) based in Brussels, Belgium.
	<b>Sachin D. Babar</b> has successfully defended his PhD thesis titled, “Security Framework and Jamming Detection of Internet of Things” on February 25, 2015 under the guidance of Prof. Neeli Rashmi Prasad, Aalborg University, Denmark. Working as Professor in the Department of Computer Engineering at Sinhgad Institute of Technology, Lonavala.
	<b>Prateek Mathur</b> has successfully defended his PhD thesis titled, “Mechanisms for Effective Utilization of Mobile Nodes in Wireless Sensor Networks” on March 22, 2016 under the guidance of Prof. Neeli Rashmi Prasad, Aalborg University, Denmark.
	<b>Pranav M. Pawar</b> has successfully defended his PhD thesis titled, “Green and Secure Medium Access Control for Wireless Sensor Network” on May 30, 2016 under the guidance of Prof. Neeli Rashmi Prasad, Aalborg University, Denmark. He is Doing Post doc at Bar-Ilan University, Israel.
	<b>Ambuj Kumar</b> has successfully defended his PhD thesis titled, “Active Probing Feedback Based Self Configurable Distributed Antenna System for Relative and Intuitive Coverage and Capacity Predictions for Proactive Spectrum Sensing and Management” on December 13, 2016 on December 13, 2016 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Post-doc student at Aarhus University, Denmark.
	<b>Madhukar M. Deshmukh</b> has successfully defended his PhD thesis titled, “Spectrum Sensing Strategies in Cognitive Radio Networks” on January 03, 2017 under the guidance of Prof. Albena Mihovska, and Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Professor and Associate Dean R&D, Department of ECE faculty of Engineering, KL University, Vijaywada.
	<b>Dnyaneshwar S. Mantri</b> has successfully defended his PhD thesis titled, “Energy Efficient Bandwidth Management in Wireless Sensor Network” on March 31, 2017 under the guidance of Prof. Ramjee Prasad, Aalborg University, Denmark. Working as Professor in the Department of E&TC at Sinhgad Institute of Technology, Lonavala.
	<b>Manohar S. Chaudhari</b> has successfully defended his PhD thesis titled, “Maximizing Energy Efficiency and Performance of resource constrained Ad-hoc communication networks” on October 9, 2017 under the guidance of Prof. Vladimir Poulkov and Assoc. Prof. Pavlina Koleva, Technical University, Sofia, Bulgaria. Working as Associate Professor in the Department of Computer Engineering at Sinhgad Institute of Technology, Lonavala.
	<b>Prashant S. Dhotre</b> has successfully defended his PhD thesis titled, “Systematic Analysis and Visualization of Privacy Policies of Online Services” on December 18, 2017 under the guidance of Prof. Henning Olesen, Aalborg University, Copenhagen, Denmark. Working as Assistant Prof. in the Department of Computer Engineering at DY Patil College of Engineering, Pune.
	<b>Gitanjali R. Shinde</b> has successfully defended his PhD thesis titled, “Cluster framework for Internet of People, Things and Services (IoPTS)” on May 8, 2018 under the guidance of Prof. Henning Olesen, Aalborg University, Copenhagen, Denmark. Working as Assistant Prof. in the Department of Computer Engineering, Smt. Kashibai Navale College of Engineering, Pune.
	<b>Sarang M. Patil</b> has successfully defended his PhD thesis titled, “Specialized antenna for EMC Measurement” on March 20-21, 2019 under the guidance of Prof. Peter Petkov and Prof. Boncho Bonev, Technical University, Sofia, Bulgaria. Working as Assistant Prof. in the Department of E&TC, SKN Sinhgad Institute of Technology and Science, Lonavala.
	<b>Javed R. Shaikh</b> has successfully defended his PhD thesis titled, “Elliptic Curve Cryptography Based Secure and Efficient Techniques to Protect E-commerce Transactions” on March 20-21, 2019 under the guidance of Georgi Iliev, Technical University, Sofia, Bulgaria. Working as Assistant Prof. in the Department of E&TC, SKN Sinhgad Institute of Technology and Science, Lonavala.
	<b>Soumya R. Samal</b> has successfully defended her PhD thesis titled, “Interference Based Efficient Power Control in Highly Dense D2D Communication Networks” on March 20-21, 2019 under the guidance of Prof. Vladimir Pukov, Technical University, Sofia, Bulgaria.



**Hitesh Singh** has successfully defended his PhD thesis titled, “Models for the prediction of Attention due to Rain, Cloud and Fog” on March 20-21, 2019 under the guidance of Prof. Boncho Bonev and Prof. Peter Petkov, Technical University, Sofia, Bulgaria. Working as Assistant Prof. in the Department of E&TC, Noida Institute of Engineering and Technology (NIET), Greater Noida.



**Purnima Lala Mehta** has successfully defended her PhD thesis entitled, “SELF ITINERANT INTELLIGENT AERIAL RADIO ARCHITECTURE (SIIARA) For coverage and capacity enhancement” on April 9, 2018 under the guidance of Prof. Ramjee Prasad, Aarhus University, Denmark. Working as Assistant Prof. in IILM College of Engineering, Greater Noida.



**Swati Prasad** has successfully defended her PhD thesis titled, “Efficient and Robust Speaker Identification System under Adverse Conditions” on September 12, 2018 under the guidance of Prof. Ramjee Prasad, Aarhus University, Denmark. Working as Assistant Prof. in the Department of E&TC at BIT Mesra, Ranchi.



**Shivprasad P. Patil** has successfully defended his PhD thesis titled, “Machine Vision Based Traffic Surveillance Using Rotating Camera” on October 26, 2018 under the guidance of Prof. Ramjee Prasad, Aarhus University, Denmark. Working as Professor in the Department of Information Technology, NBN Sinhgad School of Engineering, Pune.



**Nandkumar P. Kulkarni** has successfully defended his PhD thesis titled “Energy-efficient hybrid cross-layer routing algorithms using multi-objective optimization for the WSNs” on January 25, 2019 under the guidance of Prof. Ramjee Prasad, Aarhus University, Denmark. Working as Associate Prof. in the Department of Information Technology, Smt. Kashibai Navale College of Engineering, Pune.



11 Students from India enrolled for PhD GISFI Program Batch -1, 2009



1<sup>st</sup> Student awarded PhD, GISFI Batch -1



“A Positive Attitude can really make Dreams come True” !!!!

## 1.8 Participation of GISFI in Conferences

Global Wireless Summit (GWS) is the world's leading conference on wireless technologies covering the latest advances in wireless communication technologies. The First GWS was successfully held in Princeton (USA), in 2013 and since then it is held every year at different locations globally. The conference brings together academia, industry and standardization bodies to explore activities, trends and future challenges towards ICT globalization including energy and security issues in existing and future wireless technologies such as cellular, short-range, sensors, radio access, vehicular communication and embedded ones. The conferences also focus on issues in cognitive and self-organizing networks, Internet of Things, nanosensors, positioning and localization, networks without borders, recent advances in information theory and its application, multimedia applications and services. A key emphasis is towards interdisciplinary - bridging across industries, universities, faculties etc. in the exploration of the newest wireless technologies pursuing new ways of communicating, new business models for the future. In some years, alongside GWS, the International Symposium on Wireless Personal Multimedia Communications (WPMC) and International Conference on Wireless VITAE are also held. GWS is an annual conference series, with versatile and timely themes addressing latest and future trends in both business and technology tracks.

Name of the conferences (joint conferences in same time duration)	Year / Place	Conference Theme
1 <sup>st</sup> International Conference on Communications, with Connectivity, Convergence, Content and Cooperation (C5)	December 16, 2013; in Mumbai (India)	Human centric Wireless Communication
2 <sup>th</sup> Global Wireless Summit (GWS-14)	May 11-14, 2014; in Aalborg (Denmark)	Challenges towards ICT globalization including energy and security issues
3 <sup>rd</sup> Global Wireless Summit (GWS-15), jointly with <ul style="list-style-type: none"> <li>• 18<sup>th</sup> International Symposium on Wireless Personal Multimedia Communications,</li> <li>• 5<sup>th</sup> International Conference on Wireless VITAE</li> </ul>	December 13-16, 2015; in Hyderabad (India)	Democratizing Communications.
4 <sup>th</sup> Global Wireless Summit (GWS-16) jointly with 6 <sup>th</sup> International Conference on Wireless VITAE	November 27-30, 2016; in Aarhus (Denmark)	Technology for the betterment of Human Communication.
5 <sup>th</sup> Global Wireless Summit (GWS-17)	October 15-18, 2017; in Century City, Cape Town (South Africa)	Towards a Virtualized Communication world-Challenges and Opportunities.
6 <sup>th</sup> Global Wireless Summit (GWS-18), Jointly with 21 <sup>st</sup> International Symposium on Wireless Personal Multimedia Communications (WPMC-2018)	November 25-28, 2018; in Chiang Rai (Thailand)	Body and Mind Integration through Information and Communication Technology.
22 <sup>nd</sup> International Symposium on Wireless Personal Multimedia Communications (WPMC-2019)	November 24-27, 2019; (Scheduled) in Lisbon (Portugal)	Digital Technologies and Business Transformation.





Inaugural ceremony of WIRELESS VITAE 2011(Chennai) from left Ulla Astman, Governor, North Denmark Region; Prof. Ramjee Prasad, Director CTIF, Aalborg University, and Poongothai Aladi Aruna, Minister Information and Technology, Tamilnadu, India. Courtesy by THE HINDU, India.



In the Conference at SRM University, Chennai, along with 30<sup>th</sup> GSSM.



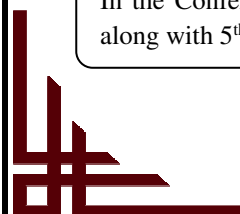
Plenary Session: Rural Telecom Connectivity in India – Challenges and Opportunities August 10, 2009



In the Conference at RGUKT University, Hyderabad, along with 5<sup>th</sup> GSSM.



GISFI conducted Joint Workshop in Bangalore on bridging the Standardization Gap Dec. 17-20, 2012



# Kaleidoscope

The ITU Kaleidoscope events aim to increase the dialogue between experts working on the standardization of Information and Communication Technologies (ICTs) and academia. By viewing technologies through a Kaleidoscope, these forward looking events will also seek to identify new topics for standardization. The objective is to hold these events once a year in different parts of the world.

Given that the concepts of innovative technologies are normally developed in the academic world, ITU is increasingly looking to attract academics from the world's universities and R&D institutions, fostering their involvement in the ITU Standardization process. There are numerous examples of this policy bearing fruit as many ITU-T Recommendations (international standards) have been heavily influenced by academic involvement.

The Kaleidoscope events also provide a venue to facilitate networking and discuss ways forward to enrich the ITU standardization process, both in terms of technical proposals for current work items and in steps to increase participation of academia and research organizations in the ITU standardization work.

The Kaleidoscope academic conferences, organized by ITU-T and technically co-sponsored by IEEE ComSoc, are international events that bring together researchers, professors and students from all over the world. The paper selection follows a rigorous double-blind, peer-revision process that involves more than 150 subject matter expert reviewers. The authors of the three best papers are awarded a total of \$10,000 prize money.

ITU-T Kaleidoscope event, Pune, India, 13-15 Dec 2010

Theme "Beyond the Internet?"

Innovations for future networks and services" - is the third in a series of peer-reviewed academic conferences that aims at increasing the dialogue between experts working on the standardization of information and communication technologies (ICTs) and academia. By viewing technologies through a "Kaleidoscope", these forward looking events also seek to identify new topics for standardization.

Thus far, the Internet has proven to be robust and flexible and its continuous evolution has seen growth from a small experiment into a giant collaborative network capable of meeting the demands of more than one billion users. The rise of mobile access and its integration with optical transport networks present new challenges. Some experts question whether the current underlying architecture is sufficiently robust to address future demands or if a "clean slate" approach is needed to develop a really innovative.



Kaleidoscope 2010 highlighted multidisciplinary aspects of future Information and Communication Technologies (ICTs) including future services and applications demand as well as social and economic impacts. The focus was on innovative technologies that could challenge the fundamental networking design principles of the Internet.

## 1.9 Details About GISFI Meetings

M. No	Year	Place	Theme
01	February 26-28, 2010	Lonavala, Pune	Announcement of I4CT
02	June 21-23, 2010	New Delhi	
03	September 15-17, 2010	Allahabad	
04	December 13-15, 2010	Pune	ITU-Kaleidoscope
05	June 1-3, 2011	Hyderabad	
06	September 27-29, 2011	Neemrana, Rajasthan	Green Technology
07	December 19-22, 2011	New Delhi	Jointly with ITU and DoT IPR
08	March 26-28, 2012.	Patna	
09	June 18-20, 2012	Mumbai	
10	September 10-12, 2012	New Delhi	Green ICT
11	December 17-20, 2012	Bangalore	ITU/GISFI Joint Event
12	March 11-13, 2013	Pune	GISFI-WWRF Workshop
13	June 10-13, 2013	Mumbai	
14	September 23-25, 2013	New Delhi	India-Japan workshop (GISFI, ARIB, TTC).
15	December 16-18, 2013	Mumbai	1st IC5 Conference
16	March 10-12, 2014	New Delhi	Communication Networks & Cyber Security Workshop
17	June 2-4, 2014	Chennai	Green Mobile Communications
18	September 1-3, 2014	New Delhi	GISFI 5 Years Anniversary, 5G Standardization: WISDOM
19	January 15-17, 2015	Surat, Gujrat	IC5 and 5 G Applications Business Models.
20	March 13-15, 2015	Bhopal	India's 5G Vision: 2020
21	June 3-5, 2015	New Delhi	Cyber Security
22	September 1-3, 2015	Mumbai	Impact of ICT on Green Environment.
23	December 13-15, 2015	Hyderabad	Global Wireless Summit
24	March 29-31, 2016	Patna	Symposium on 5G
25	July 21-23, 2016	Bangalore	5G Internet of Things (IoT)
26	September 26-27, 2016	Mumbai	5G CONASENSE
27	December 2-3, 2016	New Delhi	Smart City
28	March 17-18, 2017	Kolkata	Digital India
29	August 17-18, 2017	Bhubaneswar	5G Smart City
30	November 16-17, 2017	Chennai	Context-Aware Communications for the Secured Environment
	February 1-2, 2018	Mumbai	Inauguration of CGC, Extra ordinary meeting
31	June 8-9, 2018	New Delhi	5 G and Beyond
32	December 8-9, 2018	Ranchi	5G: Enhancing Connectivity for Rural Development
33	June 24-25, 2019	New Delhi	Green and Secure Networking for CONASENSE
34	October 22-23, 2019	Mumbai	GISFI Alumni Meet, GISFI 10 Years Celebrations

**“Energy, Enthusiasm, Journey Continues .....”!!!!**



Opening of GISFI 2009 at Sinhgad Institute of Technology, Lonavala –Pune



1<sup>st</sup> GSSM, SIT, Lonavala



2<sup>nd</sup> GSSM, Allahabad



6<sup>th</sup> GSSM, Neemrana, Rajasthan



7<sup>th</sup> GSSM, HMR- New Delhi



11<sup>th</sup> GSSM, Huawei Bangalore



13<sup>th</sup> GSSM, Vishwaniketan, Mumbai



22<sup>nd</sup> GSSM, Vishwaniketan, Mumbai



29<sup>th</sup> GSSM, SOA Bhubaneswar



30<sup>th</sup> GSSM, SRM University, Chennai



31<sup>st</sup> GSSM, IETE New Delhi



32<sup>nd</sup> GSSM, BSNL Ranchi



33<sup>rd</sup> GSSM, IETE, New Delhi



## 1.10 CGC and its Role in GISFI

Core TeleInfrastructure Global Capsule (CGC) ([www.ctifcapsule.org](http://www.ctifcapsule.org)), an international association of Academia and Industry aims to be the world research leader in cross-disciplinary/inter-disciplinary research areas. CGC attained legal status in March 2016. It provides a research platform, where academicians, researchers, from the European Union and other countries can also collaborate with institutions, research centres and the industry in the resolution of challenges faced in different thematic research areas. The objectives of CGC are in facilitating educational activities namely interdisciplinary publications, PhD and master program etc. Additionally, the CGC will support businesses in strengthening their business models, by collaboration with international partners.

The CGC primarily focusses on several research areas ranging from ICT to basic science, to medicine etc. Studies are undertaken by establishing the close connection between biomedical studies and knowledge and its exploitation through ICT tools. The CGC will also devote its effort on Knowledge Human Bond Communication Beyond 2050 (Knowledge HOME) with extensions to machines and the environment, focusing not only on the two forms (*i.e.*, visible and audible) which is possible today to transmit partial information using the wireless communication technologies, but to also leverage and engage the other three senses of touch (tactile), smell (olfactory) and taste (gustatory). Human Bond Communication (HBC) represents a real cultural challenge, since it is intended to investigate, beyond multi-sensory communications, both from the basic research standpoint and from the technological viewpoint the possibilities within the near future to use ICT for the early and non-invasive detection of biomedical events occurring in cells and tissues. HBC would bring about a dramatic change in the technological ecosystem in terms of possible applications, analysis, and utilities, mainly focusing the research on translational medicine. CGC has developed strategically a research portfolio consisting of 12 Thematic Areas in which CGC wants to be strong and have “a foot print” in. CGC Divisions run different exchange programs and e.g. staff members Mobility course. As a member of CGC, all researchers/project participants have access to office and Lab facilities to any CGC Division worldwide. CGC divisions openly host industrial PhDs and guest researchers from all over the world, who want to study and join CGC research projects and team.

CGC- Aarhus University (Herning) was officially launched during its Second Workshop jointly with the Round Table Discussions on ‘Future Technologies for Business Ecosystem and Innovation (FT4BI)’ on April 27-28, 2017 in Herning.

The purpose of MoU is broadly to establish a program and formalize for the benefit of students and faculty of respective educational institutions. The following Institutions are the currently members of CGC, with whom MoUs have been signed.



Inauguration of CGC at Vishwaniketan, February 1, 2018



Inauguration of CGC at BIT Sindri, February 11, 2018

Broad objectives of GISFI and CGC are similar and under bigger umbrella of CGC, GISFI will function as an arm of CGC.



Inauguration of CGC at SUN, Nashik, Dec. 3, 2018

# CGC Divisions Across the Globe

CGC/CTIF Divisions April 2019



Memorandum Of Understanding (MoU)



- CGC Aarhus University, Herning, Denmark, 26 April 2017
- CGC, ITU San Jose, USA, 27 February 2018
- CGC Vishwaniketan, Mumbai, India, February 2018
- CGC BIT Sindri, India, February 2018
- CGC UK, Huddersfield, UK, 2 July 2018
- CGC Sandip, India, 3 December 2018
- CTIF Denmark, Aalborg, 29 January 2004 & and Copenhagen 11 March 2008
- CTIF Italy, Tor Vergata, 28 September 2006
- CTIF Japan (Yokosuka Research Park, YRP) 3 October 2008
- CTIF USA, Princeton University, 26 April 2011
- CTIF University of Kolkata, India, 1 December 2007
- CTIF South East Europe (Montenegro, Croatia, Romania, Macedonia, Bulgaria, and Greece), 24 September 2018
- CTIF Zimbabwe, National University of Sciences & Technology, 5 September 2019
- Germany
- Spain
- The Netherlands
- Norway
- Slovenia
- Thailand
- Singapore
- Brazil
- Ghana
- South Africa
- Pakistan
- Bangladesh
- Australia
- China
- South Korea
- Indonesia
- Taiwan
- Hyderabad

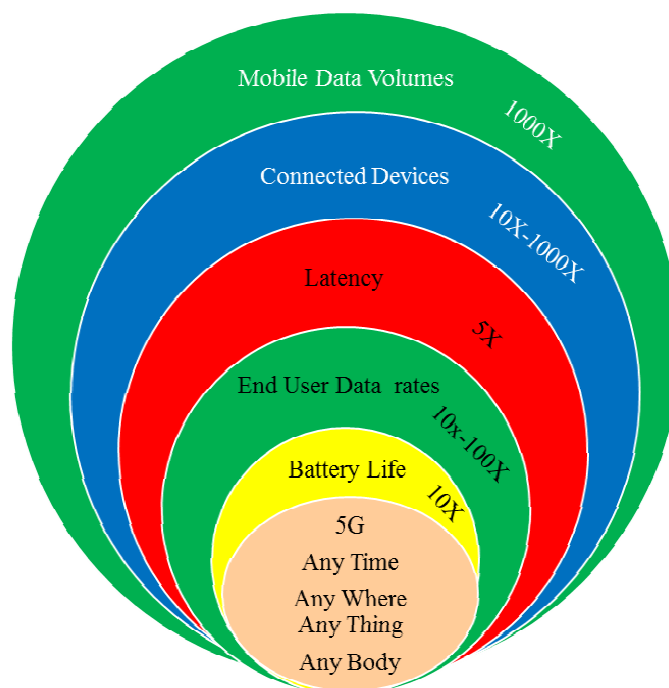
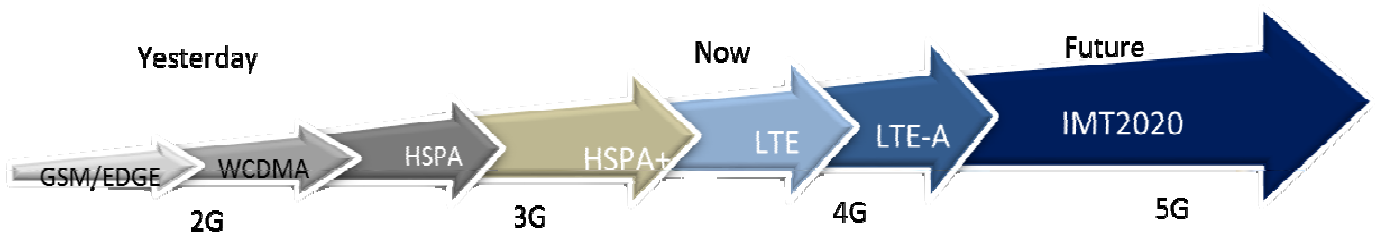
## 1.11 GISFI Initiatives on 5G

Recognizing the growth of future generations of mobile communications, GISFI took a lead role for research and developmental studies in all the areas of 5G, through its meetings since 2014. Additionally, GISFI had established a research centre on 5G at Vishwaniketan, Navi Mumbai. The significant GISFI meetings which took place on 5G are mentioned below:-

- 18th meeting during September 1-3, 2014 at New Delhi on **5G Standardization**
- 19th meeting during January 15-17, 2015 at Surat on **5G Applications Business Models**
- 20th meeting during March 13-15, 2015 at Bhopal on **India's 5G Vision:2020**
- 24th meeting during March 29-31, 2016 at Patna, "**The first International Symposium on 5G Technology in Asia**", This Symposium was inaugurated by Hon'ble Minister of Communications & Information Technology (MCIT).

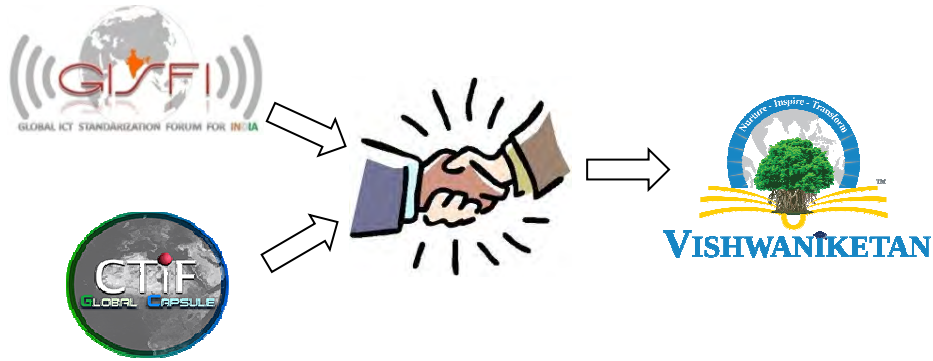
Union Minister for Communications and Information Technology, Shri. Ravi Shankar Prasad, urged Indian Institute of Technology (IIT)-Patna researchers to take the lead in 5G technology innovations to help provide ultra-high speed internet connectivity. He stressed that 5G technology along with Internet of Things (IoT) and Artificial Intelligence will also lead to transformation and creation of Indian patents in 5G technology. He invited industry leaders, brands, innovators, academia and the policy makers to join in the concerted efforts, from all corners, celebrating the true spirit of digital India. (<https://timesofindia.indiatimes.com/city/patna/Minister-asks-IITP-to-work-on-5G-tech/articleshow/51606839.cms>)

- 25th meeting during July 21-23, 2016 at Bangalore on **5G Internet of Things (IoT)**
- 26th meeting during September 26-27, 2016 at Mumbai on **5G CONASENSE**
- 29th meeting during August 17-18, 2017 at Bhubaneswar on **5G Smart City**
- 31st meeting during June 8-9, 2018 at New Delhi on **5G and Beyond**
- 32nd meeting during December 8-9, 2018 at Ranchi on **5G: Enhancing Connectivity for Rural Development**





## 1.12 Association of Vishwaniketan with GISFI and CGC



### Vishwaniketan

An outcome of GISFI effort

### UG Fellowship

900 + Students Completed

Started in 2014 with 2 Universities and 26 Students

Reached upto 14 Universities till today with 230 Students

### PhD Opportunities

for Indian Teachers Technology/PBL  
78 Teachers Benefited

### MS Opportunities (with 80% Scholarship)

1. University of Arkansas
2. National Technological University, Ukraine
3. University of Nevada, Las Vegas, USA

Proposed Joint Global Research Opportunities through CGC

**Achievements** : 12 Start-up Companies formed by students  
: Research Papers Published (250+)  
: Patents Filed 28 +  
: Increase in employability for the Students

visit: [www.vishwaniketan.edu.in/UG\\_Fellowship/index.html](http://www.vishwaniketan.edu.in/UG_Fellowship/index.html)







# GISFI Major Achievements and Awards

- ▶ Inaugurated the I4CT, February 28, 2010.
- ▶ Inaugurated Institute of Excellence – Vishwaniketan iMEET, Navi Mumbai, 2012.
- ▶ More than 25 PhDs awarded under the umbrella of GISFI.
- ▶ More than 20 MoUs and collaborations with Industry, Institutes and Standardization Bodies.
- ▶ ITU-GISFI-DS-CTIF Standards Education Workshop conducted.
- ▶ GISFI supported NIKSUN's World Wide Security and Mobility Conference.
- ▶ One Day GISFI Introductory Workshop to Industries, August 10, 2009.
- ▶ GISFI has published the outcome of its activities in a book, "Future Trends and Challenges for ICT Standardization" Edited by Prof. Ramjee Prasad and published by River Publishers, February 1, 2010.
- ▶ GISFI become sector member of ITU-T, April 22, 2010.
- ▶ Prof. Ramjee Prasad, GISFI founding Chairman had a very fruitful meeting with the Japanese Vice Minister of Internal Affairs and Communications to discuss the GISFI objectives and goal and the role it can play for the future collaboration between India and Japan on March 9, 2012.
- ▶ GISFI has been invited to the China-Japan-Coreia (CJK)-11 meeting, Miyazaki, Japan on March 14-16, 2012.
- ▶ ITU and GISFI conducted Joint Workshop in Bangalore on Bridging the Standardization Gap on November 30, 2012.
- ▶ Started Journal of ICT Standardization on October 1, 2013.
- ▶ GISFI initiated standardization activities in 5G and beyond, December 2013.
- ▶ Outstanding Organizational Leadership Award, presented to Prof. Ramjee Prasad for "Leadership in Globalizing the Center for TeleInfrastruktur (CTIF) Research Network" at the award ceremony organized by the IEEE AESS in St. Louis, USA on September 17, 2014.
- ▶ Launched Book on 5G: 2020 and Beyond.
- ▶ Prof. Ramjee Prasad was elected as WWRF Fellow



Honor Certificate given by Governor Smt. Mridula Sinha, Goa.



Outstanding Organizational Leadership Award

*The Best Time to plant a Tree was 10 years ago, The Second Best Time follows...!!!*



*Thanks & Regards*

