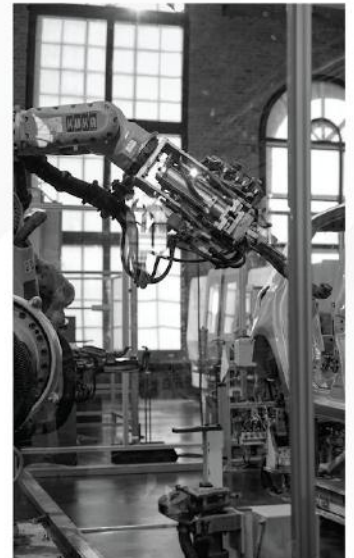


MEDICAL



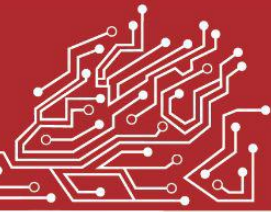
INDUSTRY



AGRICULTURE



DEFENCE



Message from Director, IIT Delhi

I am happy to see the 3rd edition of Cobotics News published by IHFC at IIT Delhi!

IIT Delhi is happy to sign an MoU with iHub Anubhuti (the TIH of IIIT Delhi) for the joint Medical Cobotics Centre (MCC) to be set-up by the two reputed institutes in Delhi. I am sure it will help all the stakeholders in the country. I am confident that this centre would facilitate and nurture the development of technologies in the area of Medical Robotics. I see that one of the Grand Projects at IHFC is Drone Applications. Our honourable PM's dream is also that India should lead the country on Drone Technologies by 2030. Hence, I would encourage the team at IHFC to initiate and lead in the area of Drone Technologies, possibly, by starting a Drone Technology Research Park (DTRP) or something of that sort. Our Sonapat campus with a large open area would be ideal venue for the training of drone pilots and conduct several tests. I am sure it will be IHFC's significant contribution in the area of Cyber Physical Systems (CPS), which is the mandate of DST's National Mission on Interdisciplinary CPS or NM-ICPS. I am also pleased to note that the Grand Projects (GP) have started now. I wish all the Principal Investigators from all over the country to consider it as a golden opportunity to work together and develop technologies (be it a hardware or software or even an algorithm) for the benefit of society. The group of experts in every GP area needs to act as the mentor group for facilitating this. I wish the new year brings new successes and fulfils the dreams and aspirations of all IHFC stakeholders.

Happy New Year 2022!



Prof. V. Ramgopal Rao

Director
IIT Delhi

Message from Project Director, IHFC

Happy new year 2022! I am very happy to celebrate the 1st anniversary of our newsletter 'Cobotics News' through this 3rd issue. Congratulations to the volunteers who have been bringing it out in a timely manner. I am proud to share several developments at IHFC. First of all, it is the release of funds to the approved projects under the seven Grand Projects, namely, Rehabilitation Robotics, Healthcare Robotics, Medical Simulators, Drone Applications, Human-Robot Interaction, Industry 4.0, and Intelligent Systems and Secured Communications. We have successfully concluded two global online courses in last six months. One was for 12 hours spanning over two weeks on the topic of Foundation of Cobotics, and the 2nd one was for 25 hours spanning over a period of one month on Machine Learning for Cobotics. Both courses were received well by industries and others. The courses were featured with experience sharing by industry experts from India and abroad, and Team-based Online Projects (TOP) where teams were formed with 3-5 participants who, in turn, did a project together relevant to the topic of the courses. The TOP actually helped the participants to assimilate the contents taught during the lectures. We are also happy to start our Medical Cobotics Centre (MCC) jointly with iHub Anubhuti (the Technological Innovation Hub or TIH of Indraprastha Institute of Information Technology or IIIT Delhi). An MoU was signed by the two institutes on November 17, 2021. The MCC will focus on Simulation-based training to inexperienced young doctors to practice many of the medical procedures and tasks using computer-controlled devices before they would really work with the patients. The facility will truly be helpful to those medical colleges in the NCR who otherwise cannot afford to buy expensive medical simulators. One of the reasons to set-up MCC in a technical institute is to emphasize technological developments/validations of new devices/tools and software (particularly, indigenous) which are otherwise missing in the medical simulation centers of the country set up by hospitals. I am sure it will be a grand success and will act as role model to other TIHs set-up by the DST.



Prof. Subir Kumar Saha

Professor, Dept. of Mechanical
Engineering, IIT Delhi

Message from CEO, IHFC

It brings me immense pleasure to welcome new year 2022 and wish everyone a happy new year via this 3rd edition of our newsletter. Our belief that collaborative robotics or Cobotics will remain at the heart of innovation in India's next stage of development, got well established in the last two years. While Covid-19 threat is hopefully behind us, but with the learning from impact of Covid in last 2 years, the need of effective machines collaborating with humans has come out as a necessity in the coming future. IHFC would continue to identify high impact area and work towards making this belief a reality. In addition to our existing accolades of associating with some of the finest technology organisations across the globe, we are also pleased to be associated with IIT-Delhi for our Medical Cobotics Centre (MCC). The magnitude of success in a project like this only increases when more than one like minded entities come together to make the vision even more grand. We look forward to realise this vision in the coming year. I would like to utilise this platform to share some of the initiatives that IHFC has undertaken in providing young minds and innovators a one stop shop to innovate and take the products to market. We are setting up an idea to unicorn facility within IIT Delhi and it comes in collaboration with yet another prestigious institute IIT Roorkee and DRIV, an initiative of Principal Scientific Adviser to PM. We launched READY (Research, Entrepreneurship & Development for You) program which has started onboarding talent from various institutes across the country to research and innovate in area of their choice. Our monthly seminar series CoboTalks completed a full year and we took this opportunity to stem into another complementary series in October 2021 targeted specifically at industry speakers called iCoboTalks. When it comes to the Grand Projects of IHFC, we are setting up an eco-system of industry and start-ups to enable requisite inputs from the market, and vehicle to carry the innovations to the market. I am hoping to see some molecules of success out of these Grand Projects in 2022. I am personally elated with the space allocated to IHFC in IIT Delhi's Sonapat campus towards setting up a best in class facility for Drone Technology. This initiative will also help some of our Grand Projects while laying down a foundation in Indian UAV space for research and development. IHFC is proud to see itself on track to achieve several milestones laid by them during the first five years of its journey. We look forward to a more productive, interactive, and value adding year 2022 for everyone. Let's co-innovate together.



Mr. Ashutosh Dutt Sharma

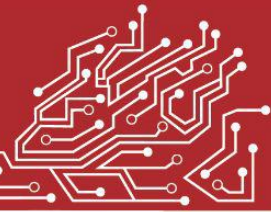
Chief Executive Officer (CEO)
IHFC, IIT Delhi

India's first Medical Cobotics Centre



TIHs of IIT Delhi and IIIT Delhi sign MoU for India's first Medical Cobotics Centre

Left-to-right:
Mr. Mukesh Malhotra,
Prof. S. K. Saha,
Prof. V. Ramgopal Rao,
Prof. Ranjan Bose,
Prof. Ashutosh
Sharma, Mr. Ashutosh
Dutt Sharma



CoboTalks: A Monthly Academic Seminar Series

- | | | |
|---|--|---|
| <p>1 14th July, 2021</p>  <p>Prof. David Hananel
Dept. of Surgery,
University of
Washington School
of Medicine</p> <p>Title: Healthcare Simulation Science, a research agenda for the next ten years</p> | <p>2 11th Aug 2021</p>  <p>Dr. Roy De Kleijn
Leiden University,
Chinese University
of Hong Kong</p> <p>Title: Man-machine collaboration in computational creativity</p> | <p>3 12th Sept, 2021</p>  <p>Prof. Madan Mohan Rayguru
EE, Delhi
Technological
University</p> <p>Title: Modelling and control of self-reconfigurable mobile robots</p> |
| <p>4 13th Oct 2021</p>  <p>Prof. Ravi Bhallamudi
ME
IIT Bombay</p> <p>Title: Product Innovation: Idea to Impact Stories and Lessons from Med-Tech Sector</p> | <p>5 10th Nov, 2021</p>  <p>Prof. Clement Gosselin
ME, Laval
University</p> <p>Title: Robot design concepts for intuitive physical human-robot interaction</p> | <p>6 8th Dec 2021</p>  <p>Prof. Soutik Betal
EE
IIT Delhi</p> <p>Title: Magno-electric Nanorobot: Revolutionary device for targeted treatment</p> |

iCoboTalks: A Monthly Industrial Seminar Series

- | | | |
|--|---|---|
| <p>1 20th Oct 2021</p>  <p>Mr. Sarthak Upadhyay
Senior Manager,
Addverb
Technologies</p> <p>Title: Robotic Picking Automation - An emerging shift</p> | <p>2 17th Nov 2021</p>  <p>Mr. Varun Jain
Chief Manager,
Addverb
Technologies</p> <p>Title: Mobile Robots: The upcoming rovers in the mobility space</p> | <p>3 15th Dec 2021</p>  <p>Mr. Satish Shukla
Co-founder &
Head, Marketing &
HR, Addverb
Technologies</p> <p>Title: Warehouse Automation: A Human-Robot Collaboration</p> |
|--|---|---|

Activity Highlights of IHFC

1

The Project Director and the CEO of IHFC visited the **AIIMS Jodhpur and Technology Innovation Hub (TIH) of IIT Jodhpur “iHub Drishti”** during September 3-4, 2021.



2

A team from IHFC visited the **TIH of IIIT Delhi “I-Hub Anubhuti” and AIIMS Delhi** on September 16, 2021.

3

The CEO of IHFC visited the **TIH of IIT Bombay for IoT and IoE** on September 20, 2021 and **DY Patil Medical College/ Simulation Centre** on September 21, 2021

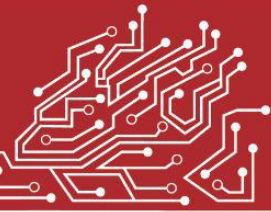
4

BHEL Haridwar Team visited IIT Delhi and IHFC on September 23, 2021 and discussed their requirement for Industry 4.0 activities.



5

IHFC started its **iCobotalks, the Industry seminar series**, from October 20, 2021 to highlight progress in the area of Cobotics in Industry.



6

The CEO of the **TIH of IIT Roorkee “iHUB DivyaSampark”** visited IIT Delhi and IHFC on October 28, 2021.

7

IHFC is collaborating with **CISCE board** for designing the curriculum for subjects in cutting-edge technologies like Artificial Intelligence and Robotics.

8

IHFC and the TIH of IIT Delhi signed an MoU on November 21, 2021 to set up the **India’s first Medical Cobotics Centre** at IIT-Delhi.

9

Several interactions have been taken place between IIT Delhi faculty and **SAIL Durgapur** and **Bhilai Steel** regarding their Industry 4.0 requirements. IHFC will be providing support to them with the help of Startups and other related companies working in the field.

10

IHFC launched the **Grand Challenge in the area of Medical Devices and Healthcare** in collaboration with MiETY and FITT.

11

Drone Technology Park to be set up at I-Tec Technopark, Sonapat Campus of IIT Delhi in 2022 in collaboration with Drone Federation of India.



Start-ups mentored by IHFC

1. Botlab Dynamics
2. Edunnovate (the innovation story)

IHFC got new office

6th Floor, Vishwakarma Bhawan, Shaheed Jeet Singh Marg, Hauz Khas, New Delhi 110 016

12

Startup studio I2U (Idea 2 Unicorn) to be set up in collaboration with TIH of IIT Roorkee Divyasampark and DRIIV S&T cluster in 2022

IHFC Partners with DD-Robocon

IHFC is the knowledge partner to the national robotics competition, DD Robocon 2022. This year's competition theme is based on "Lagori", a traditional Indian game. Curtain Raiser to DD Robocon was jointly organized by IHFC and IITD-AIA FSM during December 15-16, 2021 to motivate and guide the prospective student teams. Experts from the Robocon organizing committee, industry, and four teams from the 2021 competition have interacted with the students. The winner of DD Robocon 2022 will be participating in the international competition ABU Asia-Pacific Robocon 2022 on August 21, 2021 in New Delhi. For more details visit www.ddrobocon.in



IHFC Grand Project Coordinators' (GPC) Workshop

The two-day IHFC GPC (Grand Project Coordinators) Workshop was held at Hotel Ashtan Sarovar Portico during December 8-9, 2021. The workshop was successful with the active participation of Grand Project Coordinators from all the seven IHFC Grand Projects viz., Prof. Asokan, IIT Madras, GPC of Medical Simulator. Prof. Ashish Dutta, IIT Kanpur, GPC of Rehabilitation Robotics; Prof. Laxmidhar Behera, GPC of both Healthcare Robotics and Drone Applications; Prof. G.C. Nandi, IIIT Allahabad, GPC of Human-Robot Interaction; Prof. Sunil Jha, IIT Delhi, GPC of Industry 4.0; and Prof. Amol Choudhary, IIT Delhi, GPC of Intelligent Sensing and Secured Communications. The workshop mainly focused on seven agendas on various aspects of the Grand Projects. The first day started with Prof. S.K. Saha, Project Director, IHFC welcoming all the participants, followed by the PoC demonstration of Grand Project Management Systems by Dr. Akash Sondhi, Lead Research Scientist, IHFC, and Dr. Susha Lekshmi S.U., Program Manager, IHFC. Prof. Saha explained the possible research collaborations between IHFC Grand Projects and National Science Foundation (NSF), USA. Prof. Saha also announced the IHFC Fellow Award for Grand Project Coordinators and Principal Investigators of the Grand Projects, and after opening the discussion with the participants, the team decided on its monitoring scheme and award amount. Mr. Ashutosh Dutt Sharma, CEO, IHFC concluded the first-day session by elaborating the potential start-up models of IHFC Grand Projects. The second day of the session focused on discussing the feedback from the GPCs which they had received after interacting with the Principal Investigators of the respective grand projects. The CEO concluded the final day session with the presentation on the way forward with an emphasis on creating an ecosystem for Grand Projects through industries, start-ups, academia, and government. In the end, Prof. Saha and Mr. Ashutosh mentioned to the participants about the upcoming February Seminar on Grand Projects with exhibitions from industry/start-ups and thanked them for their valuable discussions in the workshop.

Skill Development

Global Online Course On Fundamentals of Cobotics

This course is primarily designed to introduce Cobotics to engineering & science graduates as well as teachers and industry professionals. The course had majorly focused on laying the foundation to develop the building blocks and tools to enhance the research and development of cobots. The course was conducted from 26th July to 4th August, 2021 and featured interaction among participants via Team-based Online Projects (TOPs) facilitated by an expert panel. The **Industry sessions by MathWorks and an International Expert** was highly acclaimed by the participants.

Speakers

Prof. S. K. Saha (IIT Delhi), Prof. K. Rama Krishna (IIT Delhi), Prof. S. Janardhanan (IIT Delhi), Prof. Shubhendu Bhasin (IIT Delhi), Prof. Chetan Arora (IIT Delhi), Dr. Dhruv Chandel (MathWorks), Dr. A. S. Mandal (IHFC) Dr. Shraddha Chaudhary (IIT Delhi), Dr. Xavier Cyril, Ex-Senior Director, L3Harris Technologies, Canada

Global Online Course On Machine Learning for Cobotics

This course was primarily designed to introduce the applications of Machine Learning in the field of cobotics to engineering and science graduates, and teachers and industry professionals working in the area of cobotics. This course has covered the elementary concepts of machine learning with illustrative case studies in the area of cobotics (collaborative robotics). This course was held from October 16th to November 15th, 2021 and made-up of 9 lecture modules along with Team-based Online Projects (TOPs).

Speakers

Prof. Niladri Chatterjee (IIT Delhi), Dr. Pramod Gupta (UC Berkeley Extension, USA), Mr. Rajesh Sinha (TCS India), Dr. Ravi Prakash Joshi (TechMagic K.K., Japan)

Team IHFC



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Saurabh Tandale (M.Sc, HSS)
Tirthesh Kotkar (M.Sc, HSS)
Akshat Govekar (M.Sc, HSS)
Md Jubair Qureshi (M.Sc, HSS)
Udayan Banerjee (PhD, SIRE)

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