India and China Scientific Collaborations at Grass-Root Level: A New Era

Da Hsuan Feng and Ankit Garg

Abstract COVID-19 marks one of the most challenging year in human history with unprecedented globalization challenges. However, there is a silver lining in the midst of such challenges in that it invigorated intensive and unlimited academic cooperation at grass-roots level between the world's two most ancient civilizations, India and China. It was a year of 1st Indo-China Research Webinar Series featuring over 5000 participants, 16 technical sessions and 10 Special Guests. Under normal circumstances, this clearly would not be possible. After all, generally, it would have required at least a year of detailed planning coupled with significant funding. The success of the series stood on the foundation of the past several years of scientific collaborations. This chapter describes this scientific cooperation in terms of youth exchange (2-way) between outstanding universities from both countries. In addition, the impact of such cooperation in terms of Joint International Research Awards has also been presented. Still, what is presented here is still only the tip of iceberg of the impact of scientific cooperation between the youth of both countries in past few years. Undoubtedly, a great deal still needs to be done to further deepen relations in people to people exchange at the scientific level between both countries, especially in seeking solutions to scientific issues of mutual interest, especially in the global existential challenges of climate change and the economic future of sustainable infrastructure development for humanity.

Keywords Indo-China webinar · Academic cooperation · Grass-roots level · International research award · Youth exchange

D. H. Feng
University of Texas at Dallas, Richardson, USA
China Silk Research iValley Institute, Hong Kong, China
Chairman of the International Advisory Board, Hainan University, Haikou, China
e-mail: dahsuan@gmail.com

A. Garg (✉)
Guangdong Engineering Center for Structure Safety and Health Monitoring, Shantou University, Shantou, China
e-mail: ankit@stu.edu.cn

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1 Introduction

The year 2020 marks the “70th anniversary of diplomatic exchange” between India and China, two of the world’s most ancient civilizations. The mutual diplomatic recognition on January 1st, 1950, is especially remarkable since India is the first non-Communist nation to do so.

Of course, year 2020 will also be recorded in human history due to the emergence of COVID-19 pandemic, which has created unprecedented and severe global health and geopolitical challenges.

Quite unexpected is that the health challenge has become the driving force in the enhancement of a global efforts in the containment of this pandemic as well as the formation of new chains of academic cooperation between various countries. To this end, young scholars from India and China, who have already been pro-active in collaboration for a number of years, leveraged this opportunity to organize the “1st Indo-China Webinar Research Series,” which lasted from the 8th to the 19th of May, 2020. Standing on the 5G technology platform through ZOOM, the series provided live-streamed lectures to and interactions for more than 800–1000 participants (each session) worldwide.

Unlike “normal” conferences of this magnitude which would require many months of meticulous and arduous planning, this conference was literally “organic” in its conception and almost spontaneously organized and implemented by the enormous enthusiasm of many young faculty members in both countries.

1.1 1st Indo-China Research Webinar Series 2020

This series was collaboratively organized by.

1. Dr. Ankit Garg, Associate Professor, Shantou University, China,
2. Prof. (Dr.) Chandresh H. Solanki, Professor, SVNIT, Surat & Indian Geotechnical Society Surat Chapter, Gujarat, India,
3. Dr. Chandra Bogireddy, Assistant Professor, Vardhaman College of Engineering, Hyderabad, India and
4. Dr. Junwei Liu, Vice Dean & Associate Professor, Qingdao University of Technology, China.

This Indo-China research webinar had 16 technical sessions, with 8 Speakers in each coming from universities in China and India. The total number of participants in all sessions were more than 5000, participating electronically primarily from China and India.

It is worth underscoring that 11 Distinguished Guests were invited to present to the audience their motivational words to promote such cooperation in the future. They are.
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1. Prof. G. L. Sivakumar Babu, President, Indian Geotechnical Society & Professor IISc Bangalore,
2. Prof. S.R. Gandhi, Director, S.V. NIT Surat, India,
3. Prof. Gautam Biswas, Former Director, Indian Institute of Technology (IIT) Guwahati, Fellow of ASME,
4. Prof. Da Hsuan Feng, Fellow American Physical Society, USA, Chairman of Advisory Board, Hainan University, Former Vice President for Research, University of Texas, USA,
5. Prof. S. K. Das, Director, IIT Ropar,
6. Prof. D. N. Singh, Institute Chair Professor, IIT Bombay & Editor in Chief, Environmental Geotechnics,
7. Prof. Chandan Ghosh, IIT Jammu, NIDM, Ministry of Home affairs, India
8. Prof. Askar Zhussupbekov, Past Vice President of ISSMGE for Asia & Director of the Geotechnical Institute.
9. Prof. Neelamani, Senior Research Scientist, Kuwait Institute of Scientific Research,
10. Dr. Jaykumar Shukla, Principal Engineer, Geo Dynamics, India and
11. Mr. Subba Reddy Nelluru (UK).

The forum is also supported by Dr. S. Sai Satyanarayana Reddy, Principal, VCE and Dr. K. Mallikharjuna Babu, Director and CEO, Vardhaman College of Engineering Hyderabad.

The success of the event was defined by the ambiance of warm and close interactions and networking among the young scholars, many were (electronically) meeting for the first time. Moreover, the event was also extensively covered by the International Society of Soil Mechanics and Geotechnical Engineering [1].

Perhaps what is most remarkable is that this research webinar series was de facto a self-discovery process. In fact, under “normal” circumstance, this would not be possible owing to the fact that not until recently, the digital technology was lacking in robustness for large scale simultaneous conferencing, and the requirement of excessive budget. Having had this experience under one’s belt, the organizers of the series are already now making plans to organize such conferences on an annual basis. Many participants mentioned that the certificates issued to those who had greater than 75% attendance have left an indelible mark of this great event in their minds.

It is not just the voice of scientists from China and India but also from other countries (USA, Sri Lanka), that is vouching for enhanced collaboration in environmental research between two countries as evident from article “China and India: Toward a sustainable world” [2, 3]. The article suggests “Science diplomacy”. It also suggests opening joint research centers related to environment especially at Himalayas, which are amongst the highest peaks in world. Such scientific cooperation at Himalayas can enhance trust, understanding and lead to a more sustainable world in future. The article provides a unique idea of converting Himalayas, from barely rocks into a mountain of scientific cooperation between countries.
1.2 Research Collaborative Schemes from Indian and Chinese Sides

Although the COVID-19 was the incentive for this Webinar forum, it needs to be pointed out that within the last few years, Indians and Chinese scientific and technological collaboration was already manifesting significant rise. As evident from the article published by News in Asia [4], there has been a strong increase in Indian students currently pursuing education and research opportunities in China. Indeed, according to an article published in Times of India, in comparison to the more traditional destinations such as the United Kingdom, United States, Australia and Canada, China has emerged to become another favorite destination for Indian students pursuing advanced studies [5].

Just recently, India and China have managed to establish various unprecedented collaborations, through a new program called SPARC or “Scheme for Promotion of Academic and Research Collaboration” [6]. This program was initiated by the vast and powerful IITs (Indian Institute of Technology) system and other top Indian universities. Under the umbrella of the IIT system, there are 23 outstanding technological universities [7]. The financial support of the program originates from India’s Ministry of Education (formerly known as Ministry of Human Resource Development). The primary mission of this program is to be the conduit to establish strong, meaningful and sustainable international cooperation between top Indian universities with their counterparts in some of the 30 top-notch Chinese universities. It should be mentioned that the program also includes collaborations of the said institutions in India with other top universities worldwide, including MIT, Stanford etc.

In 2018, a number of Chinese universities have been awarded joint projects [8]. This year (2019), SPARC has already made the call-for-proposals with results awaiting.

With the above information as background, as far as scientific and technological platforms are concerned, contrary to what has been reported in the media, India has in fact and to a great extent deepened the collaboration with China. The program SPARC which was initiated in 2018 has become one of the flagships of a variety of such Indo-China programs.

It is worth underscoring that SPARC is not a hollow program, but one which puts “money where its mouth is.” For example, for a faculty who meets the requirement threshold to spend one academic year in an India university to conduct collaborative research, he/she shall receive a stipend of up to $15,000 USD per month.

Other programs such as VAJRA (or Visiting Advanced Joint Research,) GIAN (or Global Initiative of Academic Networks) and an assorted University-based schemes initiated by individual IIT campuses to invite foreign faculty for visiting their respective campuses have also created a positive atmosphere to increase visits by Chinese faculty members to India, either as Adjunct or Visiting Faculty in various IITs.

For example, Prof Zhou Hongfu from the South China University of Technology in Guangzhou has joined IIT Delhi as a Visiting Professor [9]. In November 2019, Dr. Changqing Chen from Tsinghua University, Beijing will deliver a speech at the
workshop on “Mechanics of Mechanical Metamaterials” at IIT Madras under GIAN sponsorship [10]. Last but not least, Huazhong University of Science and Technology in Wuhan and Shanghai Jiaotong University have in past years recruited a number of young Indian faculty members namely, Dr. Akhil Garg and Dr. Kolan Madhav Reddy, respectively.

There is also program known as “海外名师” (Overseas outstanding teachers project), which is meant to invite eminent faculties from all over world to spend long or short time in China. Recently, in August 2020, Dr. Neelima Satyam, who is currently Associate Professor and Head of Department of Civil Engineering, IIT Indore) have successfully been nominated by such a program to visit Shantou University to establish research cooperation. She is currently an executive member of the Indian Geotechnical Society. She wanted to establish collaboration with the faculty members in Shantou University in landslide monitoring and also bio-remediation technology for treatment of soil treatment.

1.3 Impact of Youth Research Exchange between Indian and Chinese Universities: A New Beginning

One should also underscore that in the past several decades, the quality of research in many Chinese universities have risen to the level where they become one of the global centers to attract fresh Indian Ph.D.s to pursue postdoctoral trainings. For example, Mr. Vinay Sharma, who is currently enrolled in a postdoctoral program at Zhejiang University, suggests that for Indians students and academicians, China actually is the closest next superpower destination in terms of technological innovation. Such a closeness in distance and economical air transport provides Indian students and young scientists an added incentive to remain closely in touch with their family.

It was evident during the past three years from number of students (at both undergraduate and postgraduate level) from elite institutions such as IIT Guwahati, IIT Jodhpur, IIT Ropar, IIT Bhubaneswar [11] and Mahindra École Centrale, Hyderabad campus visited Shantou University as well as other universities such as Guangxi University and Qingdao University of Technology (refer to Figs. 1, 2 and 3). These students from India were not in China merely to participate in the conventional course-based exchange. Rather they are there to work hand in hand with their Chinese counterparts in joint research projects. Such exchanges could be regarded as the new experiments to promote “research-based communications,” which inculcates strong “cultural communications and bonding” among young students between the two countries. It is different from conventional classroom teaching atmosphere, where students rarely get the opportunity and the true “motivation” to join hands to understand and integrate each other’s “mindset” to solve problems.

One of the major outcomes was the international recognition of joint research carried out by visiting students. The joint research conducted by Mr. Phani Gopal from Mahindra École Centrale, Hyderabad campus, Dr. Sanandam Bordoloi (IIT
Guwahati), Dr. Junjun Ni (Hong Kong University of Science and Technology, Hong Kong, China) and Mr. Weiling Cai (Shantou University) was awarded International Telford Award from the British Civil Engineers Association [12]. The work was jointly supervised under the Vice-Dean, Prof Lin Peng (Shantou University), Prof Mei Guoxiong (长江学者 in Chinese), Dean of College of Civil Engineering and Architecture, Guangxi University), Dr. Ankit Garg (Shantou University) and Dr. Tjalfe Poulsen (Associate Professor, Guangdong-Technion Israel Institute of Technology (GTIIT), China). International exposure of students through GTIIT, a Sino-foreign cooperative educational institution established by Shantou University (STU) and the Technion—Israel Institute of Technology (theTechnion), can also provide a new “dimension” in scientific mindset of youth.

In addition, Dr. Gangadhar Reddy (Fig. 4), who received funding from the Chinese Scholarship Council conducted collaborative research project with Prof Honghu Zhu, who is a Professor at the School of Earth and Sciences of Nanjing University (Fig. 5).

Also, the research group at Nanjing University led by Prof Shi Bin (Recipient of Distinguished Young Scholars Fund of National Natural Science Foundation of China (杰青) and First Prize of National Science and Technology Progress Award of China) is the pioneer in developing state of art optical fiber technology for real-time monitoring of geo-engineering infrastructure. Dr. Reddy said he greatly values such experiences and wanted to implement this advanced technology in an infrastructure projects in India in the future.

Similarly, Mr. Himanshu Kumar from IIT Guwahati along with Mr. Rahul Balaji and Mr. Sadashiv S.G. from IIT Bhubaneswar conducted research exchange at Guangxi University under the supervision of Prof Guoxiong Mei Guoxiong (Figs. 1 and 2). Prof Guoxiong Mei is the recipient of the Youth Award of Mao Yisheng Soil mechanics and Geotechnical Engineering, 2019 (茅以升土力学及岩土工程青年奖) and also member of Teaching Supervisory Committee, Civil Engineering of colleges and universities, Ministry of Education (教育部高等学校土木类专业教学指导委员会). Visiting students (from IIT Bhubaneswar) at Guangxi University worked on design and development of novel stable carbon for enhancing water sorption capacity of sponge city infrastructure. Such international collaborative efforts and support from administration of these universities made such visits highly useful from the scientific point of view. This could have long term impact in knowledge sharing and development of joint technology for infrastructures.

It is certainly not a surprise for anyone to find an American Chinese studying in China, but it was astonishing to locate two American born Indian sisters studying MBBS program at Shantou University Medical College. From the authors brief conversation with them, it was discovered that their parents (American Indians) had in-depth knowledge of the Chinese education system and the accompanying career prospects. Not only in terms of students, but also many faculty members who are currently employed in Chinese universities, who are Asians with foreign origin. Therefore, China is not only becoming an attractive destination for students within Asia, but also to Asian Americans.

One should never forget the profound contributions of Dr. Dwarkanath Shantaram Kotnis (or known in China with his Chinese name Ke Dihua; Chinese: 柯棣华),
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Fig. 1 Mr. Rahul Balaji and Mr. Sadashiv S. G. (IIT Bhubaneswar), Mr. Himanshu Kumar (IIT Guwahati), Mr. Huang Shan and Mr. (Guangxi University) with Prof Guoxiong Mei (Changjiang Scholar (长江学者) and Dean of College of Engineering, Guangxi University, China)

who was one of the five Indian physicians dispatched to China to provide medical assistances during Sino-Japanese War in 1938. In fact, in the south side of Martyr’s Memorial park in Shijiazhuang city of the Northern Chinese province of Hebei, there is a statue of D. Kotnis, where people pay tributes to remember his contribution. In addition, a school is named after Dr. Kotnis as the Shijiazhuang Ke Dihua Medical Science Secondary Specialized School. Soon, there would be a bronze statue to be erected outside a medical school in north China, which will be formally unveiled in September 2020. This shows that such eternal bonding has existed even in terms of toughest times during history between scientists of both nations.

1.4 1st Research Visit of Chinese students to IIT Guwahati

In addition to above research output, another major outcome from the above discussed exchanges of Indian students was the reciprocal visit of Chinese students (Mr. Weiling Cai and Mr. Peinan Chen; Fig. 4) to IIT Guwahati campus. As far as the authors are aware of, this visit could be the first ever visit of Chinese students to IIT Guwahati
campus, even though students from Japan, South Korea, Africa and middle east Universities have made regular annual visits for quite some time.

According to Mr. Weiling Cai: “It was in fact the “confidence” that was built up from previous visits of Indian students that motivated me to explore India’s academics.”

Unquestionably, the visit by Mr. Cai can be regarded as highly unusual for a Chinese student who comes from Guangdong province, which is one of the economically most developed provinces of China. Most students in Guangdong tend to visit developed countries such as UK, USA and Canada for the standard academic exchanges during and throughout their undergraduate careers. It was purely the cultural bonding with the visiting Indian students in Shantou University that ultimately motivated him to engage an academic visit to IIT Guwahati.

Not surprisingly, after Mr. Cai’s successful visit, another student, Mr. Peinan Chen decided to follow suit to visit India.

India is a nation of vast cultures and languages. Indeed, these visits by Chinese students were highly successful not only in terms of joint research output (as mentioned above,) but also in significantly enhancing their appreciation of the diverse “Indian culture” by the Chinese students.

For example, Mr. Weiling Cai took the opportunity during his stay in India to participate in an international conference held at IIT Roorkee, which is one of the oldest campus (known as Thomason College of Civil Engineering; 1854–1947) in India established during the British Era. The visit was specifically mentioned in the
admission brochure for the 2020 students. The news of his visit was also covered by Indians in China (IIC) group, which is a well-known platform to share culture and exchange between two countries. As a result of such efforts, Mr. Weiling Cai was also awarded a national scholarship and MPhil scholarship to study at Hong Kong University of Science and Technology, which is ranked amongst the top 50 universities in world.

Similarly, Mr. Liu Yun, who had jointly conducted research with Indian students was awarded prestigious national scholarship and also international scholarship for conducting Ph.D. at University of Technology, Sydney in 2020.

Dr. Vikas Pratap Singh (Ph.D. in 2018, IIT Jodhpur) who was hired by Eaton Research Laboratory in Pune (a major city located in Maharashtra province of India) is grateful for his research visit and learning he received in China. In fact, his employer even made a telephone call to his supervisor, Dr. Akhil Garg (then at Shantou University) about the ability of Dr. Vikas Pratap Singh. Table 1 summarizes student exchanges between Indian and Chinese universities as initiated by Dr. Ankit Garg and his collaborators.

1.5 Chinese Delegation Visits to IIT Guwahati, IIT Bhubaneswar and NIT Meghalaya

Apart from the youth research exchanges, there has been significant increase in delegation visits for scientific exchange between India and China. Some of these visits were personally covered by Dr. Ankit Garg.

It was early winter in 2018, when a research team (Fig. 7) from Shantou University visited IIT Guwahati to explore cooperation in several cutting-edge areas including green infrastructure, electric vehicles etc. During their visit, they met Prof Gautam Biswas (then Director of IIT Guwahati, Fellow of ASME) and Administration from Alumni and External Relations office (Dean, Prof Ravi Mokashi Punekar and Associate Dean, Prof Rakhi Chaturvedi (Now Dean)).

The team from Shantou University introduced to their Indian hosts the Chinese higher education system. Ideas were exchanged as to how to enhance and scale up cooperation between IIT Guwahati and Shantou University. This delegation visit resulted in exchanges of students from both sides (Figs. 3 and 6). Similarly, In January 2019, this delegation also made visits to IIT Bhubaneswar (Fig. 8) and National Institute of Technology (NIT) Meghalaya (Fig. 9) which led to exchanges of students at Guangxi University (Fig. 1), Qingdao University of Technology (Fig. 2) and Nanjing University (Fig. 5). A short workshop on “Fundamentals of Academic Writing” was conducted for improvement of scientific writing skills of Ph.D. scholars [14]. Recently, the delegation visit to IIT Indore campus has led to joint publications and also overseas famous project application of Dr. Neelima Satyam (Associate Professor and Head of Department of Civil Engineering, IIT Indore) to visit China in 2021.
Table 1  Summary of selected student exchange between Indian and Chinese Universities

| Name                                      | Research visit type, organization and timeline | Current position/remarks                                                                 |
|-------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------|
| **Dr. Sanandam Bordoloi** (Former Ph.D. Scholar, IIT Guwahati, India) | Visiting Scholar, Shantou University (October 2017–January 2018) | Post-Doctoral Fellow, at Hong Kong University of Science and Technology (HKUST), Hong Kong, China  
  *Co-author in International Telford Premium Prize from British Civil Engineers Association* |
| **Mr. Himanshu Kumar** (Former undergraduate student, IIT Guwahati) | Visiting Scholar, Shantou University and Guangxi University (January–June, 2019) | Ph.D. at HKUST, Hong Kong, China                                                        |
| **Mr. Suriya Ganesan** (Former research Scholar, IIT Guwahati, India) | Research Associate, IIT Guwahati (May 2018–June, 2019) | Master Program at Qingdao University of Technology, China                                |
| **Mr. Shubham Gaurav** (Undergraduate student, IIT Guwahati, India) | Research Internship to Shantou University (May–July 2019) | –                                                                                       |
| **Mr. Palash Mathur** (Former undergraduate student, IIT Guwahati, India) | Research Internship to Shantou University (May–June, 2018) | –                                                                                       |
| **Mr. Phani Gopal Maddibiona** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–August, 2018) | Co-author in International Telford Premium Prize from British Civil Engineers Association |
| **Mr. Weiling Cai** (Former Undergraduate student, Shantou University, China) | Research exchange to IIT Guwahati (August 2019–January, 2020) | MPhil at Hong Kong University of Science and Technology, Hong Kong, China  
  *Co-author in International Telford Premium Prize from British Civil Engineers Association* |
| **Mr. Peinan Chen** (Former Undergraduate student, Shantou University, China) | Research exchange to IIT Guwahati (January–June 2020) | Engineer at China Construction Ltd                                                      |
| **Dr. Vikas Pratap Singh** (Former Ph.D. Scholar, IIT Jodhpur, India) | Research Internship to Shantou University (May–July, 2018) | Senior Research Engineer Eaton Research Laboratory, Pune, India                         |
| **Dr. Surinder Singh** (Former Ph.D. Scholar, IIT Ropar, India) | Research Internship to Shantou University (May–August, 2018) | Post-Doctoral Fellow, Université Laval, Quebec, Canada                                  |

(continued)
| Name                                | Research visit type, organization and timeline                        | Current position/remarks                                                                 |
|-------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| **Mr. A.K. Jishnu** (Undergraduate student, IIT Bhubaneswar, India) | Research Internship to Shantou University (May–July, 2019)             | –                                                                                        |
| **Mr. Dosetti Kartik Datta** (Undergraduate student, IIT Bhubaneswar, India) | Research Internship to Qingdao University of Technology, China (May–July, 2019)  | –                                                                                        |
| **Mr. Aman Singhal** (Undergraduate student, IIT Bhubaneswar, India) | Research Internship to Qingdao University of Technology, China (May–July, 2019)  | –                                                                                        |
| **Mr. Rahul Balaji** (Undergraduate student, IIT Bhubaneswar, India) | Research Internship to Guangxi University, China (May–July, 2019)       | –                                                                                        |
| **Ms. Insha Wani** (Ph.D. Student, IIT Jammu, India) | Co-Ph.D. supervision with Dr. Vinod Kushvaha, IIT Jammu                | –                                                                                        |
| **Mr. Sri Prasanna** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–July 2018)              | –                                                                                        |
| **Mr. Sri Krishna** (Former Master student, NUS Singapore) | Research Internship to Shantou University (May–June, 2018)             | –                                                                                        |
| **Mr. Chaitanya Ruhatiya** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–July, 2018)              | –                                                                                        |
| **Ms. Sudipta Sarmah Bijoy** (Ph.D. Scholar, IIT Guwahati, India) | Research Internship to Shantou University (March–April, 2018)           | Ph.D. Scholar at IIT Guwahati                                                          |
| **Mr. Raval Ratnam** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–July, 2018)              | –                                                                                        |
| **Ms. Hima Sankari** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–July, 2018)              | –                                                                                        |
| **Ms. Rishita Boddhu** (Former undergraduate student, Mahindra École Centrale, India) | Research Internship to Shantou University (May–July, 2018)              | –                                                                                        |
| **Dr. Ankit Goyal** (Ph.D., NIT Jaipur, Chinese Scholarship Council Awardee) | Visiting Scholar, Shantou University (September 2018–July, 2019)        | Post-Doctoral, University of Amsterdam, Netherlands                                      |
Table 1 (continued)

| Name                                      | Research visit type, organization and timeline                                                                 | Current position/remarks |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------|
| bDr. Gangadhar Reddy (Ph.D., IIT Bhubaneswar, Chinese Scholarship Council Awardee) | Visiting Scholar, Shantou University (September 2019–June, 2020)                                               | –                        |

*a,b Selected exchange as per authors knowledge and in-depth background. Authors are themselves involved in the exchange process.

Fig. 3  Students from IITs and Mahindra Ecole Centrale with Vice Dean Prof Peng Lin (Shantou University)

2 Concluding Remarks

India and China have enjoyed millennia of peaceful and mutually profitable co-existence. A shining example of these two countries’ interaction was when Xuan Zhen (602–664 AD) in the Tang Dynasty made the long and arduous visit to India to obtain the original writings of Buddha, thus allowing Buddhism to flourish in China and other parts of East Asia. However, despite such celebrated historical events, with present geopolitics, there still exist much room to improve the cultural communications between the two countries.

To this end, in India today, there are a few truly distinguished individuals who have devoted their intellectual pursuits to create a better ambiance for both countries and, and more importantly, deeper understand of China, historically, politically, technologically and intellectually.
One such individual is Professor Bali Deepak of Jawaharlal Nehru University (Fig. 10). Not only has Professor Deepak been a constant visitor to China to discuss and propose more congenial Sino-India geopolitics, he has also completed the monumental task of translating the ancient FOUR BOOKS (四书), namely, Great Learning (大学), Doctrine of the Mean (中庸), Analects (论语) and Mencius (孟子) into Hindi. The content of these four books, without a doubt, defines the most profound Chinese mindset. Their translations can and will provide for the vast Indian population a deeper and comprehensive understanding at its core the Chinese philosophy and ways and means!

Of course, the above-mentioned programs are merely some of the many examples indicating that one is observing the fledgling sea change between India and China engaging in scientific and technological collaboration. For two nations with a combined population of 2.6 billion (roughly 40% of the world’s population,) this is at best only a tiny effort.

Such a collaboration should indeed be globally meaningful since China and India are countries with ancient and robust civilizations and wisdoms along with a combined 40% of the world’s population. Undoubtedly, these outcomes are fundamentally the consequence of India and China placing top priorities in their respective unlimited pursuit of scientific and technological innovations and excellence in nation building. We are confident that in the coming years, scholars from these two great
nations can and will continue to collaborate hand-in-hand to ensure that their collaborations will not only value-add to their nations, but that it will be a shining example of how humans can work together to overcome existential challenges.

The two authors would like to reminisce their first meeting (i.e., University of Macau; refer to Fig. 11) in 2015, where they initiated the discussion of analyzing how to strengthen the scientific people-to-people exchanges between India and China. For the second author, it was indeed in itself a destiny in his exploration of China from an entirely different perspective. In the past 5 years, this entire intellectual transformative journey for him, which is still continuing, can only be described as profound and mesmerizing.

This article summarizes grass-roots level exchanges between India and China. Such exchanges are not be easy or likely to locate in numerous geo-political discussions or books. It is our equanimity hope that what holds to be self-evident is that the people of these two countries will surely tap into their ancient respective wisdoms and continue to pursue meaningful and sustainable exchanges, irrespective of the current and hopefully temporary geopolitical complexities.
**Fig. 6** Glimpses of exchange of Mr. Weiling Cai and Mr. Peinen Chen to IIT Guwahati, India
Fig. 7 Visit of delegation from Shantou University to IIT Guwahati in January 2018. Description from left to right: Mr. Wanshai Shynret (Assistant Registrar and HOS, IIT Guwahati); Dr. Ankit Garg; Dr. Akhil Garg; Dr. Qinhua Wang; Prof Gautam Biswas (then Director, IIT Guwahati); Dr. Xiongbin Peng; Prof. Ravi Punekar (then Dean, Alumni and External Relations office, IIT Guwahati); Prof. Rakhi Chaturvedi (Associate Dean, Alumni and External Relations Office, IIT Guwahati)

Fig. 8 Visit of Shantou University faculties to IIT Bhubaneswar and Interaction with Dr. Hanumantha Rao (left): On the right is picture showing lecture by Dr. Xiongbin Peng, who was invited by Dr. Prasenjit Rath (Assistant Professor, IIT Bhubaneswar)
Fig. 9  Visit of Shantou University faculties to National Institute of Technology (NIT) Meghalaya; Prof Bibhuti Bhusan Biswal (Honorable Director of NIT Meghalaya; second from left), Dr. Xiongbin Peng (center), Dr. Akhil Garg (leftmost), Dr. Ankit Garg (rightmost)
Fig. 10 Author of this article (Prof Feng Da Hsuan) with Prof Bali Deepak (Jawaharlal Nehru University). Picture was taken during his invited visit to University of Macau
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Fig. 11 Authors of this article (Dr. Ankit Garg (left) and Prof Da Hsuan Feng (right)). Picture was taken at University of Macau during visit of Dr. Ankit Garg, when he was Assistant Professor at IIT Guwahati in 2015. Prof Da Hsuan Feng was the Special Advisor to President of University of Macau and also Director of Global Affairs

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References

1. ISSMGE (2020) https://www.issmge.org/filemanager/article/782/ISSMGE_BULLETIN_2020_JUN_FINAL.pdf
2. Bawa KS, Goodale E, Mtemi W, Chen YF, Barthakur R, Goodale UM, Pandit MK (2020) China and India: toward a sustainable world. Science (New York, NY) 369(6503):515
3. Bawa KS, Goodale E, Mtemi W, Chen YF, Barthakur R, Goodale UM, Liu J, Jiang A, Mammides C, Meegaskumbara M, Pandit MK (2010) China, India, and the environment. Science 327(5972):1457–1459
4. Pandey S (2019) China: a huge draw for Indian students. https://newsin.asia/china-is-a-huge-draw-for-indian-students/
5. ChhapiaH (2018) China gets more Indian students than Britain. https://timesofindia.indiatimes.com/india/china-gets-more-indian-students-than-britain/articleshow/62398336.cms
6. SPARC (2020). https://sparc.iitkgp.ac.in/
7. Council for Indian Institutes of Technology (2020). https://www.iitsystem.ac.in/
8. SPARC (2020). https://sparc.iitkgp.ac.in/apProposal_list.php
9. Department of Mechanical Engineering (2020). https://mech.iitd.ac.in/content/prof-zhou-hongfu
10. Global Initiative of Academic Networks (GIAN) (2019). https://gian.iitkgp.ac.in/ccourses/approvecourses2
11. IIT Bhubaneswar (2019). IIT Bhubaneswar young minds research visit to China international cooperation in less than a year. https://www.iitbbs.ac.in/notice/news_1579261000.pdf
12. ICE (2020). ICE publishing awards 2020. https://www.icevirtuallibrary.com/page/authors/awards-2020
13. Zhu HH, Shi B, Zhang CC (2017) FBG-based monitoring of geohazards: current status and trends. Sensors 17(3):452
14. Kushvaha V (2019) Session on fundamentals of academic writing. https://iitjammu.ac.in/civil_engineering/post/Fundamentals%20of%20academic%20writing