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SPECTRUM

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GeoHealth Analytics

Connecting Maps, Medicine and Data

HIGHLIGHT

ISPRS SC SUMMER SCHOOL 2026 ON SMART CITIES, BEIJING

REGIONAL CAPACITY BUILDING PROGRAM BY ISPRS ICWG V/IV

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- PROFESSOR DILEK KOÇ-SAN
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FORESIGHT: PRE-CONGRESS ISPRS SC SUMMER SCHOOL

BACK COVER: ISPRS CONGRESS EARLY BIRD REGISTRATION

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JOIN *THE* SPECTRUM *TEAM*

ENGAGE *WITH OUR GLOBAL NETWORK OF EXPERTS AND BE* **EMPOWERED**

We are constantly in search for passionate volunteers to be part of the ISPRS-SC Newsletter team. If you are a student or a young professional (between 20-35 years old), willing to lend your time and skills with the passion to tell stories, share knowledge and experiences, then join us as a **CONTRIBUTOR** to the Spectrum.

Have a passion for design, layout, and infographic? Be one of the volunteers of our **CREATIVE DESIGN TEAM** and help us in telling stories through pictures and images.

Take the opportunity to work with the international array of experts at **ISPRS SC** to bring the latest stories and developments in the field of Remote Sensing, Geomatics, and Photogrammetry.

If you are interested, please email us at ***sc.isprs@gmail.com***. We look forward to hearing from you.

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MESSAGE *FROM THE* BOARD

Dear Readers and ISPRS SC Community,

Happy New Year 2026! I hope the first one and a half months of the year have treated you well. I extend my warmest wishes for the months ahead. May they be productive and inspiring to us all.

The year 2025 witnessed remarkable shifts in research and technological advancement worldwide. The conversation around Generative AI has rapidly evolved toward Agentic AI, while discussions on artificial general intelligence and superintelligence continue to shape global research agendas. We have also seen significant progress within our own domains: spatial information science, remote sensing, and photogrammetry: recent research highlights the emergence of foundation models capable of processing multispectral and multi-resolution imagery, improving performance across classification and mapping tasks. Major missions such as ESA's Biomass satellite and the NASA–ISRO NISAR mission have expanded global monitoring capabilities through forest carbon measurement and dual-frequency SAR imaging. Meanwhile, advances in multi-sensor fusion, AI, and the integration of satellite and UAV data are pushing the boundaries of Earth observation research.

ISPRS SC has also undergone notable developments in its activities. You may have observed our dedicated youth events accompanying in-person engagements, including student-focused sessions at Geospatial Weeks and hybrid youth networking events during ISPRS mid-term symposia. A particularly exciting milestone has been the growth of ISPRS SC Student Chapters, our newest addition to the member community. These chapters are active locally across the globe while remaining connected to the wider ISPRS network through the bi-monthly virtual meetups we organize. Through these platforms, we have hosted guests from diverse backgrounds, including accomplished women professors in geoscience and editorial teams from ISPRS journals, to empower and guide our members.

As of 18 February 2026, we are proud to have 956 active members from 65 countries, reflecting renewed memberships from 2024. In 2025, we hosted 27 webinars in technical support of various ISPRS Working Groups, with one session reaching a record 203 attendees. Our summer schools continued as in-person experiential learning events, often with ISPRS SC serving as co-organizer or joint organizer with partial funding support. The newsletter maintained its continuity with three issues released last year; this edition completes our planned annual volume of four issues. You may also have noticed changes within our Board of Directors (BOD). We acknowledge and apologise for the occasional inconsistencies in executing our activities and sincerely thank you for your patience and understandings. As all BOD positions are voluntary, each member contributes freely alongside their professional commitments to sustain our flagship events while introducing new initiatives. I am deeply grateful to our BOD colleagues for their dedication and service.

MESSAGE *FROM THE* BOARD

Equally, I want to recognize our volunteers, not only the design team listed on our website but also those who supported us in person at exhibition booths during ISPRS events. Your support make our presence visible and impactful. We also appreciate the active participation of our members in 2025 polls, which helped us better understand your expectations regarding ISPRS SC's service areas and potential renaming. Additionally, we extend our sincere thanks to the ISPRS Council and The ISPRS Foundation for their continued support and guidance in carrying out our activities.

You will certainly feel our in-person presence at the ISPRS Congress 2026, which is shaping up to feature various youth-focused activities, including the first Young Scholar Night in the history of ISPRS Congress. The ISPRS SC Summer School will be held as a pre-congress event, featuring a learning com competition format where student groups present solutions to pressing real-world challenges. Alongside these, we will continue our strong virtual engagement, building on the momentum of 2025.

As a final note, we are actively working toward rebranding ISPRS SC based on your feedback gathered through polls and event interactions. Personally, I am excited about it, and our entire BOD is committed to shaping it together with you. If you have suggestions regarding restructuring or future directions, please remember—we are always just an email away. Your messages will be discussed during our monthly BOD meetings, and actions will be taken accordingly. Stay connected through our website and social media to keep up with upcoming activities. And yes, do not forget to renew your membership!

Happy New Year 2026 once again. May it bring prosperity, kindness, and happiness to our community and beyond.

Kind Regards,

LAXMI THAPA
President

MESSAGE *FROM THE* BOARD

As the world moves further into the post-pandemic era, there is a renewed and critical reflection on the role of scientific and political institutions in the management of public health crises. Across democratic societies, this moment has prompted a re-evaluation of governance frameworks and policy strategies aimed at safeguarding public health and advancing long-term societal well-being.

Contemporary global challenges: ranging from air pollution and climate change to obesity, poor nutrition, mental health disorders, inequitable access to healthcare, unsafe water and sanitation, food insecurity, malnutrition, and escalating urban environmental risks, underscore the urgent need for integrated, evidence-based responses.

In this context, we express our sincere appreciation to Professor Dilek Koç-San (Department of Urban and Regional Planning, Akdeniz University), Assistant Professor Priyanka Singh (Department of Natural and Applied Sciences, TERI School of Advanced Studies, Delhi, India), and Professor Muralikrishna Iyyanki (President of iSPACE and former Dr. Raja Ramanna Distinguished DRDO Fellow) for their thoughtful and substantive contributions through the interviews featured in this issue: **GeoHealth Analytics: Connecting Maps, Medicine, and Data**.

At the outset of the New Year, we reaffirm our commitment to informed dialogue and interdisciplinary collaboration that can advance the scholarship in the field of remote sensing, photogrammetry and spatial information science.

Best Regards,

EFTHYMIOS GEORGIOU
Newsletter Editor-in-Chief

REPORT OF 2025

SUMMER SCHOOL ON SMART CITIES

06TH TO 11TH APRIL 2025

Introduction

The Summer School was jointly organized by the ISPRS Student Consortium (ISPRS SC), ISPRS, Beijing University of Civil Engineering and Architecture (BUCEA), and the Belt and Road Architectural University International Consortium (BRAUIC), with a thematic focus on methods and technologies for Smart Cities. Experts from ISPRS and leading international universities were invited to deliver lectures and training sessions for students and young professionals, providing advanced theoretical knowledge and practice-oriented skills in intelligent urban construction and management, artificial intelligence applications, cultural heritage protection, urban resource efficiency, and sustainable urban development planning.

In addition to the core academic courses, the program incorporated a series of interdisciplinary and culturally oriented practical activities, enabling participants to connect technical learning with real-world applications. Through intensive academic exchange and collaborative practice, the Summer School promoted multicultural, multidisciplinary, and multi-level interaction among participants from diverse regions.

This year, the Summer School attracted over 100 experts, teachers, and students from 14 universities and research institutions across 11 countries, including China, Russia, Nepal, Turkmenistan, Uzbekistan, the United Kingdom, India, Finland, Mexico, Iran, and Nigeria. The participants engaged in a ten-day program combining intensive academic training with in-depth social and cultural practice. Among them, a substantial proportion were international teachers and students, reflecting the strong global engagement and openness of the Summer School.

Overall, the Summer School delivered strong academic and educational impact within the ISPRS SC framework by integrating high-level international expertise with practice-oriented training. It enhanced participants' professional competencies and global perspectives on smart and sustainable urban development, strengthened international academic networking and institutional collaboration, and contributed to the ISPRS SC objectives of capacity building, youth development, and international cooperation.

Participants of the Summer School during a cultural tour

Table 1: Topics and Activities Information

Activity 1	Construction and Development of BeiDou Navigation Satellite System Prof. LU Xiaochun, Deputy Director of the National Time Service Center of the Chinese Academy of Sciences
Activity 2	Beidou Navigation & Smart Tracking: Empowering the Campus "Fun Run" with Satellite Navigation, GNSS and LBS Association of China (GLAC)
Activity 3	Recreating Ancient Architecture: 3D Printing Bringing World Heritage to Life Assoc. Prof. YANG Junxing, Associate Professor of BUCEA Mr. GAO Di, Teacher of BUCEA
Activity 4	Cultural Heritage Protection and Challenges Prof. HOU Miaole, Deputy Dean of School of Geomatics & Urban Spatial Informatics of BUCEA Assoc. Prof. GUO Xian, Associate Professor of BUCEA
Activity 5	Ecological Restoration & Urban Renewal: Sustainable Community Design and Practice Workshop, Collaboration with the 2025 Belt and Road International Student Competition on Digital Architectural Design
Activity 6	Sustainability in Cementitious Construction Material Dr. SU Meini, Department of Civil Engineering and Management, the University of Manchester, UK

Activity 7	Construction and Development of BeiDou Navigation Satellite System Prof. LU Xiaochun, Deputy Director of the National Time Service Center of the Chinese Academy of Sciences
Activity 8	Beidou Navigation & Smart Tracking: Empowering the Campus "Fun Run" with Satellite Navigation, GNSS and LBS Association of China (GLAC)
Activity 9	Recreating Ancient Architecture: 3D Printing Bringing World Heritage to Life Assoc. Prof. YANG Junxing, Associate Professor of BUCEA Mr. GAO Di, Teacher of BUCEA
Activity 10	Cultural Heritage Protection and Challenges Prof. HOU Miaole, Deputy Dean of School of Geomatics & Urban Spatial Informatics of BUCEA Assoc. Prof. GUO Xian, Associate Professor of BUCEA

Activity 1: Construction and Development of BeiDou Navigation Satellite System

This presentation begins by explaining satellite navigation principles and global developments, briefly introducing major global and regional navigation satellite systems like GPS, GLONASS, Galileo, QZSS, and NavIC. It then details the BeiDou Navigation Satellite System (BDS) development history, service standards and performances, seven supporting sub-systems, GNSS applications and promotion, international cooperation efforts, and future plans. This presentation comprehensively demonstrates BDS evolution from a regional navigation satellite system to a global navigation satellite provider, now advancing toward an integrated PNT framework.

Academic lectures during the Summer School

Prof. LU Xiaochun

LU Xiaochun is a Senior Researcher, doctoral supervisor, and Deputy Director at the National Time Service Center of the Chinese Academy of Sciences. Her main research focuses on satellite navigation and time synchronization. She has led and participated in several major national projects, and is honored with the special government allowance from the State Council. She is also an awardee of the National "Hundred, Thousand, Ten Thousand Talent Project" and has been recognized as a "National Expert with Outstanding Contributions" for her achievements.

Activity 2: Beidou Navigation & Smart Tracking: Empowering the Campus "Fun Run" with Satellite Navigation

Co-hosted with the GNSS and LBS Association of China (GLAC), this event will leverage China's independent Beidou Navigation system. A digital and smart application scenario will be created at the Daxing Campus of BUCEA. Participants will engage in a campus "Fun Run" orienteering competition combined with quizzes, unlocking 16 hidden task points. This unique event blends technology, sports, culture, and entertainment, offering a fun and interactive way for students and faculty to engage with knowledge, physical activity, and science in a fresh, exciting format.

Activity 3 Recreating Ancient Architecture: 3D Printing Bringing World Heritage to Life

Focused on the World Heritage site "Beijing Central Axis: A Building Ensemble Exhibiting the Ideal Order of the Chinese Capital", this workshop combines historical culture with cutting-edge 3D printing technology. Students will explore the architectural features of classic buildings while learning 3D modeling and printing techniques, giving them the chance to bring historical structures to life as tangible models. The workshop emphasizes practical skills and creative design, fostering interdisciplinary collaboration, and offering a unique opportunity to experience the fusion of ancient and modern elements.

Mr. GAO Di
Since 2014, Teacher Gao Di has been working at the Engineering Practice Innovation Center of Beijing University of Civil Engineering and Architecture, serving as a key backbone teacher of the center. He has been deeply engaged in the front line of engineering practice education for college students, mainly responsible for the teaching and guidance of the numerical control technology

Assoc. Prof. YANG Junxing
YANG Junxing, Ph.D., Associate Research Fellow, received his Doctorate in Engineering from the School of Geodesy and Geomatics at Wuhan University in December 2021. His research interests include 3D reconstruction, computer vision, autonomous driving, and image stitching. He has led several projects, including the National Natural Science Foundation of China (Youth Program), the China Postdoctoral Science Foundation (General Program), the Beijing Postdoctoral Research Foundation, and various industry-funded projects. As the first or corresponding author, he has published over 10 papers in SCI/EI-indexed journals, holds three national invention patents and one software copyright, and has participated in the formulation of two industry and group standards.

course in the metalworking practice, and simultaneously in charge of the teaching related to the cutting-edge 3D printing and 3D digital design. He has accumulated rich practical experience. Teacher Gao is actively involved in the innovation and entrepreneurship education for college students, dedicated to cultivating students' innovative thinking and practical abilities. He undertakes the guidance of college students' innovation and entrepreneurship projects, organizes various college students' discipline and science and technology competitions, and is responsible for the operation and management of the center's open sharing platform. In addition, Teacher Gao also participates in the planning and implementation of engineering practice research and study activities for both on-campus and off-campus students, actively expanding the breadth and depth of practical teaching, and has made continuous contributions to enhancing students' comprehensive engineering literacy and innovative spirit.

Activity 4: Cultural Heritage Protection and Challenges

Prof. HOU Miaole

HOU Miaole, Ph.D., Selected as a Changjiang Scholar by the Ministry of Education of China. She currently serves as the Executive Deputy Director of the Beijing Key Laboratory of Fine Reconstruction and Health Monitoring of Architectural Heritage and leads the discipline of digital architectural heritage. Her research focuses on the digital conservation of complex architectural heritage, with innovations in spatial data acquisition and virtual restoration that have broken international monopolies and been applied in over 60 engineering projects. As the lead contributor, she received two First Prizes of the National Mapping Science and Technology Progress Award (2016, 2018). She has been selected for several prestigious talent programs in Beijing and received honors including the Mao Yisheng Youth Science and Technology Award and Youth Beijing Scholar. She has led over 60 research projects, including National Natural Science Foundation grants and sub-projects of the National 973 Program. Dr. Hou has published nearly 80 papers (20 indexed by SCI/EI), authored 4 books, and held 20 patents and software copyrights. She also serves as Vice Chair of the Youth Committee of the Beijing Society for Geodesy and as an academic committee member of the CIPA-ICOMOS-ISPRS conference. She is a reviewer for NSFC and major academic journals and has contributed to the revision of China's geography discipline classification.

Assoc. Prof. GUO Xian

GUO Xian, Ph.D., Associate Professor, Master's Supervisor, Assistant Dean, Co-Chair of the Working Group on "Regional and International Education Programs" at the International Society for Photogrammetry and Remote Sensing (ISPRS), Youth Committee Member of ISC-China, Member of the International Spatio-Temporal Service Committee of the China Association for Geospatial Information, and Visiting Scholar at the Grenoble Planetary and Astronomy Laboratory in France. From 2010 to 2015, Guo Xian pursued a Ph.D. in Photogrammetry and Remote Sensing at the State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing at Wuhan University. Subsequently, Guo conducted postdoctoral research at the State Key Laboratory of Resources and Environmental Information Systems, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. Research interests include: information mining from high dimensional spatio-temporal remote sensing data, intelligent collaborative processing of multi-source geospatial data, and digital twinning of complex spatial scenes.

Activity 5: Ecological Restoration & Urban Renewal: Sustainable Community Design and Practice Workshop

In collaboration with the 2025 Belt and Road International Student Competition on Digital Architectural Design, this workshop will take participants to the "Eden Chunshanli" Eco-Education International Living Demonstration Zone in Jizhou District, Tianjin. Focusing on the ecological restoration of abandoned quarries, participants will work in groups to conduct research and engage in hands-on technical practice, developing reports on the current state of the site and proposals for enhancing its appearance and functionality. The project will integrate education, nature, health, technology, and tourism, offering a unique and immersive cultural experience that highlights the connection between urban and rural environments., Participants will gain insight into the distinctive "Chunshanli Impression".

A2025 Belt and Road International Student Competition on Digital Architectural Design is calling for participation.

Learn more at the following link:
https://brauic.bucea.edu.cn/english/Events/673c8eb238054c1196e4e8410d28cd40.htm

Theme: Symbiosis Regeneration
- First Prize: RMB 60,000 (pre-tax); Prepaid Gift Card: RMB 10,000 (Prepaid gift cards can be used at Eden Eco-Education and Internati onal Living Demonstration Zone.)
- Sign-up Deadline: July 10, 2025
- Work submission Deadline: August 20, 2025

Activity 6: Sustainability in Cementitious Construction Material

The Office of National Statistics estimates that the UK's construction sector accounts for 6.1% of GDP. As valuable as the impact of this sector is to national and global development, its impact on energy consumption (60-70% of cement production cost is expended on energy) and greenhouse gas emissions is immense. For instance, the emission from the UK's construction industry was 13 million metric tonnes in 2019 and has continuously increased since 1990. With the current global push for more stringent legislations on energy efficiency, the profitability as well as sustainability of construction industries would significantly depend on how much they lower their energy consumption and carbon footprints. While several initiatives including carbon capturing technologies are currently explored within the cement industry, questions related to technical complexity and cost implications still linger. Therefore, the on-going research explores the application of graphene within the construction sector to improve energy efficiency, raw material optimisation and the overall performance of cement/concrete. Investigations have shown that a tiny amount of graphene can significantly improve the mechanical and electrochemical properties of cement-based construction materials with reduced carbon emission.

Dr. SU Meini
Dr. SU Meini is Associate Professor at University of Manchester and Safer Infrastructure theme lead at Thomas Ashton Institute for Risk and Regulatory Research. Her principal research interests, in respect of which she has co-authored one textbook and some 60 papers, lie in the areas of structural testing, numerical modelling and the development of design guidance for FRP strengthened RC structures in marine environment as well as steel and aluminium alloy structures. In particular, through her involvement in the research projects, she has proposed the continuous

strength method (CSM) for aluminium alloy structures, a dualfunctional intervention method – the impressed current cathodic protection & structural strengthening (ICCP-SS) technique and a green recycling method for FRP composites. In addition, her collaboration with Graphene Engineering Innovation Centre is bearing fruit and is currently a PI in the £0.3 million EPSRC project (Dual-functional graphene-modified carbon-fibre reinforced cementitious matrix (FRCM) composite for simultaneous corrosion protection and structural) and a Co-I in the £1.1million UK-China Joint project (Green recycling and remanufacturing of carbon fibre composites for a circular economy).

Activity 7: Digital Twin: Building the Future with Smart Technology: An Exclusive Tour to the Leading Company in Digital Construction

Join us for an exciting visit to Glodon Technology Co., Ltd., where you'll explore the cutting-edge technologies shaping the future of the construction industry. At the Glodon Digital Building Experience Center, you will experience firsthand the deep integration of cutting-edge technologies such as BIM, big data, and AI with the construction industry through interactive digital demonstrations, smart electronic sandboxes, and 3D immersive displays. See how these technologies are revolutionizing the construction industry, and learn about the full digital management process from design and construction to operation and maintenance. Engage with company executives in a discussion on "Digital Architecture and Smart Construction Leading the Future of the Construction Industry," where they'll share insights into digital city building, AI architecture models, energy-saving projects, and practical innovations.

Mr. FAN Zhiguang

FAN Zhiguang has long been dedicated to the digital transformation of the construction industry, with a focus on emerging technologies like artificial intelligence, BIM (Building Information Modeling), and smart construction. He actively promotes the development of digital construction talent in universities. Fan has served as the Chief Editor of several textbooks and reports, including Application of Digital Quantity Surveying Technology, BIM Construction Organization Design and Management, and Report on Talent Development in Intelligent Construction. He has also been invited as an expert to speak at university lectures, contribute to industry college initiatives, and engage in strategic collaborations. Topics of his speeches include "The Future and Development of Digital Architecture" and "The Digitalization of the Construction Industry: Trends and Applications", covering the use of BIM, IoT (Internet of Things), and artificial intelligence in construction, as well as the growing demand for digital talent in the industry.

Activity 8: Ancient Chinese Architectural Design: The Juyongguan Great Wall

The total length of the Great Wall of China is 21,196.18 km, distributed in 15 Provinces (Tongbin Chen et al. 2018, 4-14). The Great Wall was firstly built in the Warring States Period (475-221 BC), based on the defensive wall in Yan State, Zhao State, and Qin State. It has been developed in the Qin (221-207 BC), Han (207 BC-220 AD), Sui (581-618 AD) and Song (960-1279 AD) dynasties. In Ming Dynasty (1368-1644 AD), the Great Wall was constructed further and improved, which made it to be the longest

strength method (CSM) for aluminium alloy structures, a dualfunctional intervention method – the impressed current cathodic protection & structural strengthening (ICCP-SS) technique and a green recycling method for FRP composites. In addition, her collaboration with Graphene Engineering Innovation Centre is bearing fruit and is currently a PI in the £0.3 million EPSRC project (Dual-functional graphene-modified carbon-fibre reinforced cementitious matrix (FRCM) composite for simultaneous corrosion protection and structural) and a Co-I in the £1.1million UK-China Joint project (Green recycling and remanufacturing of carbon fibre composites for a circular economy).

Dr. CHENG Fei

CHENG Fei is Research Associate, Institute of Architecture and Public Arts, Chinese National Academy of Arts, Beijing, China. She was a visiting scholar in the University of Sheffield and Newcastle University, the UK. Her research fields are architectural art, study of the cultural heritage, Chinese National Cultural Park of the Great Wall. She has had numerous publications on architectural heritage.

She was PI of the "Cultural Value of the Traditional Construction Techniques and Craft of Interlocked Timber-arched Covered Bridges" project, funded by China's National Social Science Fund (17BG140). She also participated in the many kinds of research projects.

Mr. FAN Zhiguang

FAN Zhiguang has long been dedicated to the digital transformation of the construction industry, with a focus on emerging technologies like artificial intelligence, BIM (Building Information Modeling), and smart construction. He actively promotes the development of digital construction talent in universities. Fan has served as the Chief Editor of several textbooks and reports, including Application of Digital Quantity Surveying Technology, BIM Construction Organization Design and Management, and Report on Talent Development in Intelligent Construction. He has also been invited as an expert to speak at university lectures, contribute to industry college initiatives, and engage in strategic collaborations. Topics of his speeches include "The Future and Development of Digital Architecture" and "The Digitalization of the Construction Industry: Trends and Applications", covering the use of BIM, IoT (Internet of Things), and artificial intelligence in construction, as well as the growing demand for digital talent in the industry.

Activity 9: Mainstream DRR for Development Safety: Implications of the Global Risk Science Priorities

Introduce the implementation status and successful cases of important international disaster reduction plans.

Prof. Han Qunli

From September 2017 to June 2024, HAN Qunli has been the Executive Director of the Integrated Disaster Risk Research (IRDR) under International Council for Science (ISC) and the United Nations Office for Disaster Risk Reduction (UNDRR). He is now Senior Science Advisor of IRDR. ore

He is also a Distinguished Professor at the International Research Center of Big Data for SDGs (CBAS) since 2021. Upon the completion of the first phase IRDR (2010-2021), he worked as a core member in the formulation of A Framework for Global Science in Support of Risk-informed Sustainable Development and Planetary Health (ISC, IRDR, UNDRR, 2021). From 1989 to 2017, HAN Qunli worked for UNESCO as senior officer for environmental sciences and the field office directors. He participated in UN joint response to major natural disasters such as the Indian Ocean earthquake and tsunami in 2004, the Central Java earthquake in 2005 and the floods in Pakistan in 2010. From 2013 to 2017, HAN Qunli was the Director of Ecology and Earth Sciences Division of UNESCO and the Secretariat of the Man and the Biosphere (MAB) Programme.

Activity 10: Silk Road Youth Synergy: Co-Creating the Future: The 4th BRAUIC Young Scholars Forum

The 4th BRAUIC Young Scholars Forum will be held under the theme “Silk Road Youth Synergy: Co-Creating the Future”. Young scholars from various countries will be invited to share their personal stories, discuss their experiences in international exchanges, and showcase the vitality of Silk Road youth. Through open dialogue and mutual learning, participants will enhance their understanding and broaden their perspectives. This is an effective approach to fostering the development of innovative, internationally-minded professionals between universities both domestically and globally.

Concluding Activities: Youth Dialogue and Exchange

In conjunction with the conclusion of the Summer School, a series of academic exchange activities were organized to consolidate learning outcomes and promote youth-oriented international dialogue. The Fourth Belt and Road Architectural University International Consortium (BRAUIC) Young Scholars Forum was held concurrently under the theme ‘Youth Voices along the Silk Road: Building the Future Together.’

The forum brought together young scholars, faculty members, and student representatives from partner institutions, including Saint Petersburg State University of Architecture and Civil Engineering (Russia), Samarkand State University of Architecture and Civil Engineering (Uzbekistan), Sharda University (India), as well as representatives from the ISPRS Student Consortium. Vasala Saicharan, Member of the Board of Directors and Website Administrator of the ISPRS Student Consortium, and Changyu Gong, Leader of the ISPRS SC China-BUCEA Student Chapter, actively participated in the forum and delivered speeches. Focusing on innovation and sustainable development within the Belt and Road framework, the discussions strengthened international academic networking and highlighted the role of young professionals in addressing global urban challenges.

The Young Scholars Forum at the conclusion of the Summer School

Following the Summer School and the Young Scholars Forum, Saicharan, on behalf of the ISPRS Student Consortium, conducted an exchange roundtable with the ISPRS SC China-BUCEA Student Chapter to discuss chapter development and future activities. The meeting focused on student chapter development, coordination mechanisms, and future activity planning, including membership engagement, academic events, and capacity-building initiatives. This face-to-face interaction provided an effective platform for direct communication between the ISPRS SC leadership and local student representatives, strengthening organizational alignment and supporting the sustainable development of student-led activities.

Exchange roundtable with the ISPRS SC China-BUCEA Student Chapter after summer school

SUMMARY

The 2025 Summer School on Smart Cities successfully delivered a comprehensive international education and capacity-building program under the framework of the ISPRS Student Consortium. By integrating high-level international expertise, practice-oriented training, and multicultural exchange, the Summer School enhanced participants' professional competencies and global perspectives in Smart City-related fields.

Through a well-structured program combining academic lectures, practical activities, youth dialogue, and concluding exchange events, the Summer School strengthened international academic networking, fostered interdisciplinary collaboration, and supported the development of globally minded young talents. Overall, the program demonstrated the effectiveness of the Summer School as a sustainable platform for education, international cooperation, and youth engagement in support of the long-term objectives of ISPRS and its Student Consortium.

Practical activities during the Summer School

Historical and Cultural Exchange Activities

PARTICIPANTS' FEEDBACK

The concept of "Smart Cities" is no longer a futuristic vision but a present and rapidly evolving reality that intertwines advanced technologies with sustainable urban development. During the summer school program on Smart Cities at Beijing University of Civil Engineering and Architecture (BUCEA), I had the unique opportunity to explore how China, a country with deep historical roots, is integrating modern technologies to reshape its cities for the future. This experience not only broadened my academic horizons but also sparked personal reflections on the potential and challenges of creating smarter urban environments.

Subedi Sushmita, Survey Department of Nepal

Attending the summer school on Smart Cities at Beijing University of Civil Engineering and Architecture (BUCEA) was a transformative experience that offered me a comprehensive understanding of how modern technology, sustainability, and cultural heritage can come together to shape future cities. Over the course of several intensive days filled with lectures, site visits, and interactive workshops, I gained not only academic knowledge but also personal insight into the complexities and possibilities of smart urban development.

Roman Pandit, Nepal Miaodi Rural Autonomous Town

The BUCEA Summer School 2025 is proving profoundly transformative. Academically, it' s building a robust understanding of Smart Cities, enriched by experiencing Beijing's incredible urban fabric. Personally, navigating the city fosters deep independence, daily interactions enhance my communication, and immersion in places from the Great Wall to bustling streets is unparalleled. Scaling the Wall, bonding with global friends, witnessing architectural marvels ancient and new, and absorbing China's essence have created indelible memories and broadened my worldview immensely. This ongoing journey is actively building bridges – between theory and the living city, across cultures, and decisively shaping my path towards contributing to sustainable, resilient, human-centered urban futures.

Tanyshev Ruslan, Tyumen Industrial University, Russia

As a master's student in architecture at BUCEA, this summer class was an exciting opportunity for me to step out of the usual routine and dive into new experiences. At the beginning of the program, we wrote down what we hoped to achieve, and I simply wrote: learn something new. Looking back, I'm so glad to say I did. Along the way, I met amazing people and even made a wonderful new friend. This summer class has been more than just an academic experience—it was a personal journey. I'm ending it having achieved my goal of learning something new, and I'm truly thankful for that.

Umar Khadija Aliyu (Nigeria), Beijing University of Civil Engineering and Architecture

Participating in the 2025 "Smart Cities" Summer School was an eye - opening journey that deepened my understanding of urban smart development. Through a series of lectures and field practices, I gained valuable academic insights and clarity about my future research interests.

Fan Xu, Tianjin Chengjian University, China

The concept of "Smart Cities" represents a vision of urban environments that leverage advanced technologies to improve the quality of life, enhance sustainability, and promote efficient governance. During my participation in the international summer school at Beijing University of civil engineering and architecture, I had the opportunity to explore this theme in depth through a series of lectures and field visits. These experiences provided me with a broader understanding of how cutting-edge technologies, environmental initiatives, and cultural preservation efforts can come together to shape future cities.

Khasanov Zabijon、Safarov Javokhirbek、Isoev Otabek、Akbaraliyev Bunyod,
Samarkand State University of Architecture and Civil Engineering, Uzbekistan

As a result of my studies at the BUCEA University Summer School, I had a unique opportunity to truly understand the ideas of smart cities and their immense potential for transforming people's lives. It became clear to me that the cities of the future should be the epitome of intelligence, sustainability, and human-centeredness. They should seamlessly integrate advanced technologies with environmental concerns, preserve cultural heritage, and actively involve residents in governance and development processes. I am convinced that through the use of innovative solutions, we can create cities where comfort and safety become natural parts of everyday life. These will be spaces where people live in harmony with nature, where technology works for the benefit of people, and where sustainable development becomes not just a goal, but a way of life.

Lvova Elena, Moscow Architectural Institute, Russia

It is with great pleasure that I share my impressions and reviews of the Smart Cities Summer School in Beijing. This experience has become a unique event for me, which has enriched not only my knowledge, but also my cultural perception in the context of urban development, architectural heritage and the latest technologies and materials.The Smart City Summer Program had a very positive impact on me as a person, allowed me to gain new knowledge and strengthen international relations and friendship between Russia and China. Thanks to my friends from BUCEA for this opportunity!

Bagaev Gleb, Saint Petersburg State University of Architecture and Civil Engineering, Russia

I would like to emphasize that the creation of smart cities should not come at the expense of the loss of cultural heritage. On the contrary, modern technologies can become powerful tools for preserving the traditional style in architecture. Studying at the BUCEA summer school gave me the opportunity to understand the importance of combining innovation with respect for history. Smart cities should be places where the past and the future coexist in harmony, creating a unique urban environment for residents and visitors. Preserving the traditional style in modern architecture is a challenge that requires creativity and responsibility from future architects and engineers.

Gula Diana, Moscow State University of Architecture, Russia

12. Regional Capacity Building Training Program on Applications of Satellite Data (Remote Sensing) for Flood Disaster Management (08-12 September 2025)

Summary

The regional capacity building training program on applications of satellite data for flood disaster management was held at the Faculty of Engineering and the Built Environment (FEBE), NUST, from 08–12 September 2025. There were 25 government officers from different departments and various regions of Namibia. The training content and schedule was introduced to equip the participants from government departments and respective authorities with the practical knowledge and hands-on skills required to use satellite data for flood and flash flood disaster risk management in Namibia. The training covered end-to-end learning from data access and image processing to mapping, risk analysis, and response planning. It also intends to support national and regional objectives in disaster risk reduction. The objective of this training attained were equipped participants with skills to interpret satellite data for flood and flash flood risk analysis, enabled real-time flood monitoring using open-access remote sensing platforms, trained for early warning, preparedness, response, and post-disaster mapping, hence made strong foundation for the integration of remote sensing for operational flood management and decision support systems.

Brief Details

- **Dates:** 08–12 September 2025
- **Venue:** Mining Engineering Boardroom, Lower Campus, Namibia University of Science and Technology (NUST), Windhoek, Namibia
- **Format:** Combining lectures and practical exercises in satellite imagery, remote sensing and spatial data analysis, open source software
- **Target Participants:** Namibia government officers from various departments.
- **No. of Participants Attended:** 25
- **Website:** https://febe.nust.na/nanosatellite-seminar-series febe.nust.na
- **Organised and Coordinated by**: Prof. Anjana Vyas, Chair, ICWG V/IV, ISPRS, India; Prof. Smita Francis, NUST, Namibia

Key Features

- One topic a day was a schedule made for learning and teaching: Fundamentals of Remote Sensing, Image Interpretation, Introduction of QGIS, Watershed creation and flood impact analysis, etc. First lecture session, followed by hands-on practicals.
- Very senior officers have attended and appreciated the learnings they receive.
- Each officer brought their laptop and respective data. They were involved in hands-on data download, image processing, flood hazard mapping and participants' presentations.

Uniqueness of the Event

- The seminar's focus on nanosatellite imagery and space-based remote sensing in the context of a regional African university setting made it unique.
- The combination of hands-on satellite/wilderness terrain analysis, open-source tools and structured participant presentations enabled them to be confident in using this technology.
- Intensive interaction, mentorship and personalised guidance were the key characteristics of learning outcomes and peer collaboration.
- The partnership of space technology (NUST's Institute for Space Technology) with geospatial educational goals aligned strongly with the mandate of working groups like ICWG V/IV to expand spatial information science education globally.
- The seminar promoted capacity building in a developing-region context (Namibia) for advanced spatial information science applications, especially relevant for Earth-observation, hazard mapping and regional development frameworks.

IMPORTANT
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OUTSTANDING
VALUABLE

Full Name: Professor Muralikrishna Iyyanki

Current Position: **President iSPACE** and Former Dr Raja Ramanna Distinguished DRDO Fellow

Affiliation: iSPACE, Hyderabad

Professor Muralikrishna Iyyanki

Research Interests and Expertise: Geospatial technology, Environmental management, Watershed analyses, GeoHealth Analytics, GeoAI, Open Innovation and Design thinking, Geospatial Entrepreneurship, Climate change adaptation, Disaster Risk Reduction, Precision farming, Land records and Terrain modeling, Drone/LEO sat data analysis - Current research interests are also in digital twins and their application, NISAR data analysis for disaster management, Urban heat islands mapping, Quantum Technologies for image understanding and analysis

1 Can you tell us about your current research in the field of geo-health analytics?

My current areas of interest and research are in the field of Geo-health analytics, such as:

- Multispectral and high resolution LEOs/cubesat data analysis to map water borne /vector borne diseases
- Digital twins for environmental exposure modeling and geospatial exposome index
- Establishing the relationship between PM of different sizes and composition based on ground observations for Indian atmospheric and terrain conditions
- Awaiting NASA ISRO SAR data for analysis and geospatial health analytics with focus on GeoAI, generative AI tools such as LLMs.

2 In your own opinion, why is your research important, both academically and practically?

Yes, I consider my research important on both academic and practical fronts because any research in geospatial health analytics, and environmental management helps in understanding and providing information based solutions, to problems related to health, environment and people. It is well established that GeoAI application is an already emerged interdisciplinary field encompassing remote sensing, GIS, ecology, epidemiology, earth sciences and AI tools to extract knowledge from geospatial data.

I contemplate its academic connotation or significance here predominantly because it advances interdisciplinary research by integrating earth science, computer science, and statistics. This supports researchers to identify sensitive, non-linear spatial and temporal patterns in data that traditional data analysis algorithms or existing statistical models could fail, leading to new theoretical understandings in population health and environmental management. In terms of practical significance what is needed for any authority is an outcome ready for immediate implementation as a possible intervention for mitigating an expected health outbreak or environmental disaster. Based on data availability about the annual average of the acute respiratory infection (ARI) patients in a few Indian states, the corresponding year's PM2.5 annual average data is retrieved from NASA satellite-derived parameters. These are plotted so as to develop a model for prediction of ARI cases. This forms the base national atlas of ARI. The occurrence of ARI is related primarily to PM2.5. This atlas has a lot of practical significance and utility for authorities to plan possible interventions for mitigating the occurrence of the ARI disease. The outcome is in the form of the following which is illustrative nature:

- Extraction of basic land-use changes
- Models for prediction of acute respiratory infection, natural disasters etc.
- Advances methods for estimating lifetime exposure to air pollution at both individual and population levels, which is vital for environmental epidemiology and public health research.

3 What originally inspired you to work at the intersection of geography, health, and data science?

Very interesting question; I took more time to answer this one. For this I analyzed my basic passion and recollected approaches I followed to plan my research. I find all these are based on my belief in empathy and my firm commitment to technology pull and not technology push. That means I always think it is not fair to push the technology whatever is known to me for management of earth, environment and people. What I aim always is to follow an empathic path and consolidate the need. As such I proposed a project to the Department of science and technology (Government of India) on the development of a national geospatial public health data management system. For this I recruited, with approval from DST under a project, about 14 principal investigators (PI) and adopted the policy of open innovation wherein the knowledge is shared through networking operation of the PIs and carried out 14 geospatial health projects.

Another important study I made is related to air pollution. Here I found that air pollution is one important parameter causing significant damages like anywhere else. One of these is related to health (ie ARI). As a remote sensing data analyst, I applied the available tools of technology and remote sensing data. I understood that remotely sensed satellite-derived data provides Aerosol Optical Depth (AOD) information, which is a measure of the extinction of the solar beam by dust and haze that blocks sunlight by absorbing or by scattering light. The data are primarily collected by instruments, on the remote sensing satellites which are operated by the National Aeronautics and Space Administration (NASA) and National Oceanic and Atmospheric Administration (NOAA). Accordingly, I continued to get inspired and work on Geo-health analytics using GIS tools, remote sensing, non communicable disease data, AI, GenAI and LLMs for possible effective understanding of the diseases, their location and analysis.

4 Looking back, what do you consider your greatest achievement in this field so far?

I am working in this exciting field of remote sensing since the early days of Landsat in 1979 at 80 meters resolution multispectral data, followed by LISS data of Indian Remote Sensing satellite, French SPOT, Sentinel, and SAR data and some of which now improved to better than 80 cm. My consolidated achievement here is my ability to create a legacy to generate classified images, apply dimensionality reduction and image fusion techniques for image understanding. While following the legacy techniques, in this era of Industry 4.0, I had quickly adopted tools of Deeptech and identified the difficulties to use CNN for unlabeled data classification/ unsupervised learning. My 3-year tenure working on hyperspectral remote sensing as a Dr. Raja Ramanna Distinguished Fellow at DRDO has been very satisfying, despite limitations in the availability of hyperspectral data and processing algorithms. I had the privilege of guiding about 48 PhDs over 3 decades addressing some of these topics. My geospatial Health National Network program coordination gave me infinite scope to mentor and, also to evaluate and learn several image processing, location based and epidemiological models. Added to these, are the models for GeoAI demonstration and ARI monitoring and possible prediction. I believe my current efforts on exposome pattern studies and corresponding GenAI based LLMs will be the next best achievement, hopefully, as far as the GeoHealth field is concerned. Also, during my tenure 2022-2026 as Chairman of ISPRS Working Group III/9, I could introduce webinars on topics of significance to students research which is supported by my ISPRS Commission III President Dr Laurent Polidori and my WG Co-chairmen Dr Maged Kamel Boulos and Dr Ashraf Dewan. Dr Laxmi Thapa, President ISPRS Student Consortium is the forum reporting secretary. I anxiously await our student community to participate in the ISPRS Toronto 2026 Congress in good numbers.

I have found there is a gap in the global space technology enterprise system and so made a proposal for a Forum Organization during forthcoming ISPRS 2026 Congress at Toronto. The topic is of great significance to youngsters who have the spirit of entrepreneurship. The Forum is on Geospatial entrepreneurship in the industry 4.0 era. Geo Innovation, digital twins and disaster and climate change areas are the key terms of reference for the forum on Geospatial entrepreneurship. Here, I believe that the geo-health in particular, and geospatial technology in general, are uniquely positioned to thrive by leveraging the mandates and opportunities presented by the industry 4.0 which is all about connecting the physical and digital worlds driven by health and environmental and non-spatial data, automation and intelligent systems. This is mentioned here as I view this event would be the best achievement for me as it promises to be innovative from various dimensions.

5 In what ways do you envision the field of GeoHealth Analytics evolving over the next five to 10 years ?

Let me reiterate that the future is already here. It looks like the present efforts on digital twins will move to greater significance. Digital twins become natural companions of exposome studies. The current reliance on static GIS mapping for visualization will give way to dynamic, simulation-based models. AI tools become part of geo health analytics in an operational manner and so on. Quantum computing tools certainly provide better solutions for population health management. A lot of things can be envisioned but let us understand that the tools of data analysis become more sharp and demanding on data quality and quantity to address real world problems in a realistic manner. Our youth need to be ready. Possible readiness is hinted as answer to question 6 below.

6 What lessons or tips would you like to share with students or early-career researchers entering the field of geo-health analytics?

I have a lot to say here because I have been with the student community for the last 3 decades. I believe that the art is very long but time is limited to validate the models and technology and face the competition. The present status of geospatial technology is that it has evolved as a powerful gadget for attempting apprehensions interconnected to the health environment and people. Geospatial technology is adding upfront the outcomes or spin-off boons of advances under “Deep Tech missions”. Let us understand that deep tech is a global and all-purpose term for a basket of technologies of AI, robotics, blockchain, biotech, and quantum computing with a prescribed protocol. Consider AI, which is the prime constituent of deep tech with applications in healthcare. As an immediate example, it can be understood that Geo AI algorithms leading to “Geospatial Generative AI” have immense implications across many tasks, for example, Climate change adaptation, disaster risk reduction, etc.

In this context, there is a need for designing the class room curriculum with a strong focus on geospatial technology as part of the deep tech mission. Inclusion of specially designed electives which cover advanced topics like epidemiology, public health, cloud computing, Python, generative AI, geospatial AI, digital twins, etc. Here, the inclusion of principles of geospatial thinking, design thinking as well as open Innovation and business model canvas on the lines of Berkeley Hass (University of California) enhance the potential for entrepreneurship.

Priyanka Singh

IMPORTANT
FOCUSED
OUTSTANDING
VALUABLE

Full Name: Priyanka Singh

Current Position: **Assistant Professor**

Affiliation: Department of Natural and Applied Sciences, TERI School of Advanced Studies, Delhi, India

Research Interests and Expertise: Data Science, Machine Learning, Geospatial Science, Citizen Science

Website: https://terisas.ac.in/faculty.php?id=%202673

Dr. Priyanka Singh is a **Faculty of Dept. of Natural and Applied Sciences** at TERI School of Advanced Studies, India. She received her PhD in Data Science from IIT(ISM) and IIRS (ISRO), India in 2019. Before joining TERI School of Advanced Studies, Dr. Singh held a faculty position at the UPES (Dehradun) and Symbiosis International Deemed University (Pune). She also worked as a Postdoctoral Research Associate in Indian Institute of Remote Sensing (IIRS), ISRO in Dehradun, Uttarakhand.

Apart from this, she also serves as **Secretary** of the International Society for Photogrammetry and Remote Sensing for Working Group (WG) IV/10 - Applied Spatial Science for Public Health. Dr. Singh has received several prestigious national and international awards and grants recognizing her contributions.

These accolades underscore Dr. Singh's innovative use of machine learning, geospatial technology, and citizen science for public health, ecological modelling and climate research, highlighting her impact on both national and international scientific communities.

1 What originally inspired you to work at the intersection of geography, health, and data science?

I have always been fascinated by the transformative power of data science in extracting location-based meaningful patterns and developing predictive applications for better and more equitable health for everyone. Early in my career, I was drawn to the transformative potential of data science and geospatial technologies, and over the time this evolved into a deep commitment and collaboration in the human sense. A turning point for me was applying data science and GIS to study outbreaks, at-risk populations, and infection tracing during the COVID-19 pandemic. This work later extended to vector-borne diseases such as dengue and malaria at global scale. Continuing my research in the public health sector, I am also involved with the ISPRS' Working Group IV/10 on "Applied Spatial Science for Public Health" as a part of this journey. My motivation to advance AI in this field is driven by a desire to combine the analytical power of data science with the spatial insights

of geography to solve fundamental health challenges. This interdisciplinary approach enables more comprehensive and effective solutions than any single discipline could achieve alone.

2 How critical do you think cloud computing is in today's geo-health research landscape?

Cloud computing has become essential in geo-health research. It allows researchers to manage and analyze huge amounts of health data in real time and provides access to data and tools from anywhere, which makes collaboration much easier. This is especially helpful for remote monitoring, tracking diseases, and making data-driven decisions globally. The scalability of cloud systems also means institutions can adjust resources based on demand, saving time and costs.
However, while cloud computing enhances data sharing and integration across diverse health systems, it also introduces challenges related to data privacy, security, and regulatory compliance, especially when handling sensitive medical information under frameworks such as HIPAA (Health Insurance Portability and Accountability Act). Despite these concerns, cloud computing has the ability to support real-time data exchange and collaborative research makes cloud computing a cornerstone of modern geo-health innovation and global biomedical research advancement.

3 What are the most important or urgent research areas in geo-health analytics that you'd like to see tackled in the next ten years?

Looking ahead, I think geo-health analytics needs to tackle areas like using GeoAI and big data to understand climate change impacts, health equity, pandemic preparedness, and personalized medicine, while addressing ethical challenges. One of the most pressing priorities is the development of real-time disease surveillance and outbreak prediction systems that combine spatial, environmental, and genomic data to forecast and manage epidemics more effectively. Equally important is investigating the health impacts of climate change, as shifting temperatures and weather patterns continue to influence the spread of vector-borne diseases, respiratory illnesses, and food insecurity. Another key research area involves addressing health inequities through spatial analysis to reveal disparities in healthcare access, pollution exposure, and health outcomes among vulnerable populations. Advancing data integration across multiple sources such as satellite imagery, mobile health apps, electronic health records, and social determinants, will also be crucial for building a more comprehensive view of population health. Moreover, ensuring privacy-preserving geospatial analytics will be vital to protect sensitive health information while enabling meaningful research.
I believe these research directions collectively can enhance predictive health intelligence, inform equitable health policies, and strengthen global resilience to emerging health threats—contributing more effectively to the achievement of the Sustainable Development Goals (SDGs).

4 What are some of the biggest challenges you currently face as a researcher in geo-health analytics?

One of the foremost challenges is data fragmentation and lack of interoperability. The diverse datasets – health, environmental, and spatial data often come from different sources, formats, and standards, making it difficult to integrate them into a cohesive framework for analysis.

Often, I found that data quality and availability remain major obstacles, especially in regions with limited technological infrastructure or inconsistent data collection practices, which can result in gaps and biases in research findings. Another pressing concern is maintaining data privacy and ethical integrity, as working with geolocated health information requires careful handling to protect individual confidentiality while still enabling meaningful analysis. I believe that collaboration between disciplines such as data science, epidemiology, and geography, is also often lacking, slowing down innovation and real-world application.

5 Are there any common misconceptions about geo-health analytics that you'd like to address?

Yes, I believe there are several common misconceptions about geo-health analytics. One frequent misunderstanding is that geo-health analytics is simply about mapping diseases or visualizing health data geographically. It goes far beyond that as it integrates spatial, environmental, demographic, and clinical information to uncover complex relationships between place, health, and behavior. Another misconception is that having access to large datasets automatically guarantees accurate insights. In truth, the quality, context, and representativeness of data are far more important than sheer volume, poor data can lead to misleading conclusions, regardless of the analytical tools used. There is also a belief that geo-health analytics is only relevant for infectious disease tracking, but its applications extend to chronic disease management, environmental health, healthcare accessibility, and even policy planning. Therefore, recognizing misconceptions is vital to advancing a more accurate, responsible, and interdisciplinary understanding of what geo-health analytics can truly achieve.

6 What lessons or tips would you like to share with students or early-career researchers entering the field of geo-health analytics?

For students and early-career researchers stepping into geo-health analytics, I would emphasize the importance of building a strong foundation that connects both health sciences and geospatial technology. Understanding how to use tools like GIS, remote sensing, and spatial statistics while grasping core concepts in public health and epidemiology is essential. I've learned that data quality and ethics must always come first, working with health and location-based data requires great care to ensure accuracy, privacy, and confidentiality. Finally, I would encourage staying curious and adaptable, as the field is evolving rapidly with advances in AI and big data.

IMPORTANT FOCUSED OUTSTANDING VALUABLE

Full Name: Dilek Koç-San

Current Position: **Professor** at Akdeniz University, Department of Urban and Regional Planning

Affiliation:Akdeniz University, Faculty of Architecture, Department of Urban and Regional Planning, Antalya - Türkiye

Professor Dilek Koç-San

Research Interests and Expertise: Remote Sensing, Geographical Information Science, Urban Planning.

Dilek Koc-San has been working as a **full professor** at Akdeniz University, Faculty of Architecture, Department of Urban and Regional Planning. She graduated from Gazi University, Department of Urban and Regional Planning in 2000. She received her PhD degree from Middle East Technical University, Department of Geodetic and Geographic Information Technologies in 2009. During her PhD research (in 2007), she visited the Swiss Federal Institute of Technology (ETH), Department of Photogrammetry and Remote Sensing as an academic guest. Previously she worked as a Research Assistant at the Middle East Technical University, Department of Geodesy and Geographical Information Technologies and Selcuk University, Department of Urban and Regional Planning. Then she worked as an Assistant Professor and after Associate Professor at Akdeniz University, Department of Space Sciences and Technologies. Her research interests include image classification, image processing, automatic object extraction, multi-criteria decision analysis, urban heat island and air pollution.

Website: https://avesis.akdeniz.edu.tr/dkocsan
LinkedIn: https://tr.linkedin.com/in/dilek-koc-san-0021a088
Twitter: https://x.com/Dilek_KocSan/

1 Can you tell us about your current research in the field of geo-health analytics?

I am currently working on studies that investigate the relationship between urbanization and air quality with geo-health, with the help of my graduate students (PhD, MSc). Air pollution is a significant problem that threatens the environment, cities, and public health. Urbanization, population growth, increased human activity due to urban growth and sprawl, the use of fossil fuels for transportation and heating, and industrialization are among the most significant causes of air pollution. The major pollutants affecting urban areas include particulate matter (PM), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and ozone (O_3). Satellite observations from Sentinel-5P (TROPOMI) are processed using the Google Earth Engine (GEE) platform for mapping the air pollutant densities. Air pollution, urbanization, and COVID-19 are examined from two perspectives and analyzed using Geographic Information Systems and statistical methods, namely: (i) the relationship between air pollutant parameters and COVID-19 case numbers, and (ii) the effects of quarantine periods during the pandemic on reducing air pollution.

2 In your opinion, why is your research important, both academically and practically?

As an urban planner and academic my researches are focusing on human beings, residential areas and environment. Environmental factors such as urbanization, rapid population growth, industrialization, climate change and air/water pollution have direct or indirect negative effects on human health. These factors may also cause an increase in vector-borne diseases. With the integrated use of remote sensing and geographic information technologies, the effects of these environmental factors on diseases can be revealed. Revealing these effects is important in terms of preventing the spread of diseases and taking the necessary precautions.

Due to the growing population and dwindling global resources, there is an increasing need to protect and efficiently use healthy and reliable living environments. For urban planning and management, it is important to investigate the effects of urban properties such as population density, city size, climate, air quality, industrial activities and types to the diseases and spread rate. The findings of these types of studies may guide urban planners and provide useful ideas.

3 What lessons or tips would you like to share with students or early-career researchers entering the field of geo-health analytics?

Actually, students and young researchers today are much more aware, they follow technology advancements and innovations, and can access information much faster than before. This is also a significant advantage for the geo-health analytics, in which technology is important. My advices to those who are new to this field might be as follows:

- Join networks related to geo-health and attend webinars, workshops and/or conferences.
- Keep up with technological developments in remote sensing and geographic information systems and use new methods and technologies that can be related to the topic of geo-health.
- Geo-health is an interdisciplinary topic, which is related to public health, geomatics, urban planning, computer engineering, environmental engineering, social sciences. Therefore, collaboration is important for geo-health studies for evaluating the subject from different perspectives.

4 What are some of the biggest challenges you currently face as a researcher in geo-health analytics?

Geo-health analytics can be performed at global, regional, or local scales. Although global and regional health data is generally available, accessing more detailed information can be challenging, which makes researching urban sub-regions difficult. In some cases, the inability to obtain detailed health data in certain areas poses a significant problem.

While air pollution and land surface temperature data can be obtained by using satellite imagery, the resolution is generally too coarse to correlate health data with urban patterns at the neighborhood or block level. This presents challenges for researchers modeling the complex relationships between disease spread and socio-spatial factors, such as urban patterns, green space, and socio-economic development, at the local level. More detailed studies require higher-resolution remote sensing data or algorithms that increase resolution and detailed health data.

Additionally, given the dynamic nature of the subject matter, temporal resolution is critical to conducting effective geo-health studies.

5 In what ways do you envision the field of GeoHealth Analytics evolving over the next five to ten years?

Along with developments in Geographic Information Systems, Remote Sensing, and Computer Technologies, rapid advancements are occurring in novel areas such as the Internet of Things (IoT), Digital Twins, Big Data Management, and Artificial Intelligence. I believe these advancements will enable the integration of data such as electronic health records, location data from mobile devices, and social media data into spatial data platforms, enabling much more detailed and comprehensive analyses in the field of geo-health.

The utilization of IoT technologies will facilitate the collection of real-time health, temperature, and pollution data, thereby enabling the continuous monitoring of current health and environmental conditions, as well as the execution of real-time analyses. By employing digital twins of cities, the impacts of urbanization, air pollution, and climate change on public health can be simulated and scenario analyses can be conducted. I believe that the implementation of these novel technologies has the potential to contribute to the field of geo-health in several ways. These technologies could be used to model the current state, forecast future risks, and identify hot-spot areas.

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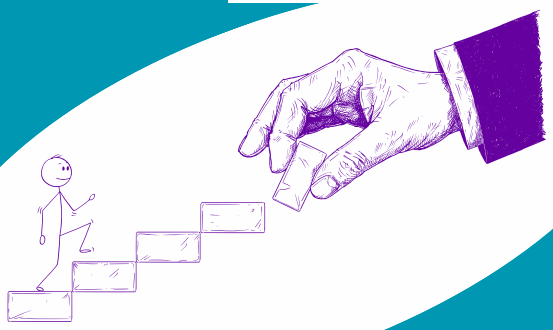

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CONFERENCE / EVENT	MAIN FOCUS	LOCATION	DATES
ForestSAT 2026	Spatial Analysis, Forestry	Florida, USA	04-08 May 2026
International Symposium on Applied Geoinformatics 2026	Applied Geoinformatics	Czech Republic	13-15 May 2026
11th International Conference on Recent Advances in Space Technologies	Air and Space Technologies	Istanbul, Türkiye	13-15 May 2026
14th EARSeL Workshop on Imaging Spectroscopy	Imaging Spectroscopy, Sensors, Platforms, Missions	Espoo Finland	2-4 June 2025
14th EARSeL Workshop on Forest Fires 2026	Remote Sensing, Earth Observation, Forest Fires	Lisbon, Portugal	25-26 June 2026
International Conference of Environmental Remote Sensing and GIS	Environmental Remote Sensing, GIS	Zagreb, Croatia	01-03 July 2026
XXVth ISPRS Congress From Imagery to Understanding	GIS, Photogrammetry, Remote Sensing	Toronto Canada	4–11 July 2025

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Location: Aix-en-Provence, France

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Institute: Swiss Federal Institute for Forest, Snow and Landscape Research WSL
Location: Birmensdorf, Switzerland

MORE DETAILS

PHD

✓ Satellite observations: deriving climate data by physically-based machine learning

Institute: Chalmers University of Technology
Location: Gothenburg, Sweden

MORE DETAILS

✓ PhD position on monitoring soil erosion indicators using remote sensing

Institute: KU Leuven
Location: Leuven, Belgium

MORE DETAILS

✓ Multimodal Deep Learning for Resilient and Robust Remote Sensing Semantic Segmentation

Institute: University of Liverpool
Location: England and Taiwan

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✓ Doctoral student in Predicting hydrological extremes with Earth data

Institute: KTH Royal Institute of Technology
Location: Stockholm, Sweden

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JOB OPPORTUNITIES

✓ Lecturer- Remote Sensing

Organisation: Clemson University
Location: Clemson, SC, USA

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✓ Remote Sensing & Geospatial Analyst II or III - REMOTE

Institute: E Source - 4.0
Location: New York State, USA

MORE DETAILS

✓ GIS Analyst

Institute: BOWERFORD ASSOCIATES
Location: Exeter, UK

MORE DETAILS

✓ GIS Network Advisor

Organisation: United Utilities
Location: Warrington, UK

MORE DETAILS

✓ Earth Observation Applications Specialist

Organisation: European Space Agency (ESA)
Location: Frascati, Italy

MORE DETAILS

✓ Principal Environmental Consultant

Oganisation: Atkins
Location: Glasgow, Scotland

MORE DETAILS

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ACKNOWLEDGEMENT

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