IISA 2022 Conference. Venue: IISC Bangalore. December 2022.

IISA NEWSLETTER

Late Fall 2021/Spring 2022

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Message from Sandeep Menon, President of IISA

Hello All,

It's a pleasure to have the opportunity to address this community and share some reflections from 2021 and thoughts looking into 2022.

Last spring, we held a successful virtual IISA Conference on May 20 – 23, 2021. This conference is designed to promote education, research, and application of statistics, probability, and data science throughout the world with a special emphasis on the Indian subcontinent. The conference fostered the exchange of information and scholarly activity among many countries as well as among other national/international organization for the development of Statistical Science. We held a vibrant student paper competition and overall encouraged cooperative efforts among members in education, research, industry, and business. Due to the challenge of continued impact of the pandemic situation the conference had to be organized virtually, the kind which have been never experienced within this community. Despite this the conference was thoroughly planned and was a huge success to bring in the contemporary statistical discussions. I want to thank the organizing committee, the University of Illinois at Chicago and the scientific program committee led by Dr. Saonli Basu, Dr. Sanjay Chaudhuri, and Dr. Satrajit Roychoudhury, who demonstrated dedication and innovation to bringing this successful event to fruition in challenging times. IISA also held a very successful virtual mini conference on January 7 – 8, 2022 with three distinguished lectures and a short course on "Introduction to Python for Statisticians." We are looking forward to hosting the IISA Bangalore Conference during December 26 – 30, 2022 at the Indian Institute of Science Campus located in Bangalore. More details about this can be found in this newsletter penned by Dr. Subhashis Ghoshal.

Last year marked momentous innovation as members of academia, industry, medical, and business sectors worked to bring solutions to the ongoing COVID-19 crisis. I am proud of my fellow colleagues at Pfizer and honored to have been part of the teams bringing the vaccine and the oral anti-viral pill to the world when needed most. The role our statisticians in Early Clinical Development and across the company was key to the delivery of these medicines. The teams used quantitative decision-making at every step, ensuring the data drove crisp and timely decisions and science moved forward with urgency. I would like to take this opportunity to applaud all members of IISA who dedicated in delivering related therapies in different private and Governmental agencies. Not to forget those epidemiologists and data scientists whose research at various capacities helped us to track the virus in real time. I am also thankful for the relentless dedication of our statisticians that have made to face the challenges of other diseases, such as cancer, who are working in Universities, Cancer Centers, and Biopharmaceutical companies. Innovation and dedication are pillars to success, and I am in awe of the strides forward for humanity this past year.

There are a number of activities we are planning to roll out in 2022. Firstly, I want to update you that we are planning to welcome data scientists in this organization as they are critical thought partners and are essential to the field of quantitative analysis. As such, we will also be changing the name of

IISA to comply with the Government of India rules and regulations as well as formally include Data Scientists. Related to this, we are working on the promising aspect of the India chapter of this association under the leadership of Dr. Isha Dewan, Dr. Debjit Biswas, and Dr. Sanjay Chaudhuri to better represent and to better communicate with the Indian community of Statistics and Data Science. This coming year, we will be working to increase out communications and will be working on a larger presence on social media such as LinkedIn. We especially encourage you to continue to spread the word about this organization among the current students in Universities and Colleges as they are our future. A reminder there too, please note that there is no membership fee for students. In addition to promoting the great work done in IISA and attracting new members, I want to remind you that we have a channel in the IISA Slack workspace for discussing and debating controversial topics. If you are not yet a member of our Slack workspace, please join us here.

I want to take a special moment to thank President Snigdhansu Chatterjee for his leadership and thoughtful partnership across the board and throughout the association. We look forward to building on what he has put in place so robustly and look forward to leaning on him as a key thought partner moving forward this year.

Finally, I want to pay tribute to the many who were affected this past year to the ongoing COVID-19 pandemic. My thoughts are with you and yours, and I remain hopeful that we will be able to meet in person in the not-so-distant future.

Warm regards,

Sandeep

International_Indian_Statistical_Association-(IISA)

68 members

Please connect with the IISA community on our Slack channel for receiving regular updates, news and building your professional network: Link to join:
https://join.slack.com/t/international-ale1861/shared_invite/zt-mlu6xyfb-nek4crzVZFhxQj3B9K6muQ
IISA student membership is completely free!

Please visit our membership page: https://www.intindstat.org/membership

President's Report on IISA for the year 2021

This brief report outlines some of the major activities and initiatives of IISA in the year 2021. As 2021 was the second year of the ongoing pandemic, many of our activities were virtual in nature. Also, this year we spent a lot of time and effort to make IISA a very transparent and efficient professional organization. Some of the initiatives outlined below reflect that.

- ***Early career researcher award winners:*** First, let me take this opportunity to congratulate the winners of the Young Statistical Scientist Award (YSSA) for 2021:

    o Dr. Parthanil Roy of Indian Statistical Institute-Bangalore in the Theory and Methods track,

    o Dr. Abhirup Datta (Johns Hopkins University) and Dr. Anindya Bhadra (Purdue University) jointly in the Applications track.

    Elsewhere in this newsletter you will find details about these fantastic researchers, whose work will continue to excite and inspire us. We did not have adequate nominations for the "Statistical Practice" category this year. My sincere thanks to the Awards Committee (chaired by Professor Suhasini Subbarao) for their work in selecting the award winners. We did not have an opportunity to felicitate Anindya, Abhirup and Parthanil in an in-person conference in 2021 due to the ongoing pandemic, so the plan is to felicitate them along with the winners of awards of 2022 in the planned IISA conference to be held in December, 2022 in IISc Bangalore.

- ***Changes in awards for early career researchers:*** Based on inputs from many people and intense discussions between members and IISA office bearers, in September of 2021 the IISA Executive Committee and Board of Trustees decided to make some changes to the awards for early career researchers. You will find the details of these changes elsewhere in this newsletter. In broad terms, the changes are as follows:

    o the Young Statistical Scientist Award (YSSA) is now renamed as the **Early Career Award in Statistics and Data Sciences (ECASDS)** to reflect the close alignment of statistics and other topics of data sciences like machine learning and artificial intelligence, and to recognize that researchers now work on many inter-disciplinary areas and contribute to a broad array of topics that were traditionally

labeled as parts of including statistics, mathematics, computer science or electrical engineering but are now mutable,

- the eligibility requirements have been changed to reflect that a researcher may be in early career possibly because they are young in terms of their age, or possibly because they may have started late in their statistics and data science research track, and to broaden the participation of members in the nomination process in these awards,

- to address the challenges faced by many statisticians and data scientists in government and industry in establishing an award-winning track record, for such cases IISA would like to be flexible but maintain very high standards.

We expect to see many exciting nominations for the ECASDS awards in 2022 and beyond!

- ***Lifetime achievement award changes:*** In the past, the IISA Lifetime Achievement Awards had been soliciting nominations once every two years. The cycle of this award was disrupted by the ongoing pandemic. Also, several members were of the opinion that since there are numerous IISA members who have contributed significantly and fundamentally to statistics and data sciences throughout their illustrious careers, the IISA Lifetime Achievement award cycle is perhaps missing out the opportunity to recognize many deserving scientists. After considerable discussions, the IISA Executive Committee and Board of Trustees decided in November 2021 to make the nomination process of the Lifetime Achievement Awards a yearly activity. Consequently, we hope to have award winners in this category every year now.

- ***New outreach initiatives:*** In 2021, IISA engaged in several new initiatives aimed at broadening the participation of students, professionals, faculty members and researchers in statistics and data sciences in all IISA activities. A few prominent initiatives are mentioned below:

  - *Engagement with ICSA and KISS:* Throughout 2021, IISA was engaged in conversations with the International Chinese Statistical Association (ICSA) and the Korean International Statistical Society (KISS) about educational and developmental outreach activities in several parts of Asia, to promote and foster the use of statistical sciences and their applications across various disciplines. I thank Dr. Vijay Nair for initiating and mentoring these conversations. Part of our common goal is to foster strong statistical research and teaching in many developing counties, including but not limited to India, China and Korea. Also part of our common goal is to help Asian statisticians achieve their career and professional goals. These engagements are continuing, and we hope to see other societies also join in in our efforts to promote statistics and data sciences worldwide.

  - *Free webinars and workshops:* In view of the ongoing pandemic, in 2021 IISA decided to launch its own free webinar series. After considerable exploration, it was decided that the web-service provider RingCentral best suits our current needs for these activities. The first seminar was delivered by Dr. Jyotishka Datta in Fall 2021. These activities will be conducted primarily by the IISA membership and outreach committee, and Dr. Arvind Rao, Dr. Shariq Mohammed, Dr. Sanjay Chaudhuri are

working on the details. IISA was a sponsor for the Philosophy of Data Science webinar series till it ended, and looks forward to sponsoring additional webinars and meetings that are in keeping with its core mission.

o _Free educational initiatives in India:_ As part of the educational development and outreach goals, IISA has started discussions with several interested parties about reaching out to students of data sciences and statistics in India, and helping them with their professional development and career goals. I would like to thank Dr. Diganta Mukherjee for engaging with IISA in this matter. Several volunteers from IISA, including Dr. Sowmya Rao, Dr. Jyotishka Datta, Dr. Abhyuday Mandal and Dr. Isha Dewan have volunteered to be involved in this process, and IISA will do its best to help this initiative flourish.

o _Free educational initiatives in the USA:_ IISA is exploring the possibility of initiating some educational development and outreach activities in USA but engaging with possibly high-school students. Dr. Sowmya Rao has expressed a keen interest in this initiative and is leading it.

● **_Free educator memberships (and free student memberships):_** In 2021, one of our major decisions was to make IISA membership available for free to educators in developing countries, including India. This complements our decision taken in 2020 to make IISA membership free of charge to students from all over the world. We hope the free membership scheme is availed of by numerous students and educators in India and elsewhere, since this brings the opportunity to network and exchange ideas with other IISA members (for example, using the IISA Slack channel where many job postings and informational items are regularly posted, accessible here: https://join.slack.com/t/international-ale1861/shared_invite/zt-mlu6xyfb-nek4crzVZFhxQj3B9K6muQ), take part in short courses and webinars offered by IISA, and present papers in IISA conferences.

Having a large community of students and educators will also help with IISA's mission of helping build the skills of statistics and data science students worldwide with particular emphasis on India, and thus create a workforce that is highly skilled and versatile in these disciplines.

We hope you will help IISA by informing and encouraging students, colleagues and friends to avail themselves of the free membership.

● **_Joint activities with other Indian statistical associations and educational institutions:_** In 2021, IISA participated in the activities of multiple professional associations in India. In particular, IISA organized an invited session in the international meeting of the Indian Society for Probability and Statistics (ISPS). Dr. Jogesh Babu, Dr. M. B. Rao and Dr. Arvind Rao were the invited speakers in this session. We thank Dr. Shailaja Suryawanshi for leading this effort on behalf of IISA. In the late summer and early Fall of 2021, IISA sponsored an international workshop titled DATUM-21 at the Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar, Gujarat. Later in 2021, IISA also participated in a conference at Andhra University. IISA is eager to jointly organize events with other professional associations in India and participate in educational, research and training activities on statistics and data sciences.

- ***Constitution and bylaws review:*** In Fall 2021, IISA set up a committee headed by Professor Sanjay Chaudhuri to review the IISA constitution and bylaws, with a view to updating and modernizing these. A second important reason for the review is to use the current IISA constitution and bylaws as a basis for formulating a similar document for the India chapter. This initiative is in continuation of similar efforts earlier, notably by Dr. Amit Bhattacharyya (IISA president in 2019). The member consultation period of this constitution review initiative is over, and the committee is in the process of assimilating the ideas and opinions expressed by IISA membership. Developments on this will continue in 2022.

- ***Background work on IISA institutional work:*** In addition to the review of the IISA constitution and bylaws, the committee headed by Dr. Sanjay Chaudhuri was also requested by me to suggest ways of making the day-to-day functioning of IISA more efficient. This includes routine but necessary work like filing taxes in time, filing all necessary government and legal paperwork correctly, professionally and in a timely manner, keeping documentation and institutional memory about collaborative efforts between professional associations where IISA is a partner, keeping documentation of the activities of different IISA committees, keeping documentation about IISA conference logistics and many such tasks. Considerable effort has already gone into improving such functions and several updates have been put in place in 2021, however, much more needs to be done.

- ***Equity and diversity committee:*** In 2021, IISA started the process of the formation of an equity and diversity committee. The primary aim in setting up this committee is to foster equitable and fair access and benefits on all IISA services and activities to all its members, irrespective of their caste, color, ethnicity, gender, race, religion or lack thereof, sex and other characteristics and identities. Numerous other professional organizations have recently set up equity and diversity committees towards the same goals, and we will actively engage with other organizations towards our common goals. Further developments on this are expected in 2022.

  IISA is unequivocally in favor of fair, ethical, equitable access of opportunities and against any form of racism and discrimination. In fact, early in 2021, a joint statement about this was made by IISA, ICSA and KISS, while condemning racist attacks worldwide.

- ***IISA Code of conduct:*** In 2020 Professor Sanjib Basu, then president of IISA, constituted a committee to draw up a code of conduct document for IISA members. Many other professional associations including the American Statistical Association (ASA), the Institute of Mathematical Statistics (IMS) and the International Society for Bayesian Analysis (ISBA) have similar codes of conduct to prevent and address harassment and harm to members, both online and in in-person meetings and other activities. The work of this committee was delayed due to the pandemic, but is now ongoing.

- ***IISA-2022 Meeting in Bangalore:*** Early in 2021, the IISA Executive Committee and the Board of Trustees decided on Indian Institute of Science, Bangalore as the venue for the 2022 annual conference of IISA. In this newsletter there are two information items relating to this conference: from the Scientific Program Committee chair Prof. Subhashis Ghoshal, and from the Local organizing Committee chair Prof. Chiranjit Mukhopadhyay. The conference website will be up and running soon, and throughout 2022 we will keep informing members about

different planned activities and modes of participation in this conference. We hope to see all of you there in Bangalore!

- ***Virtual meeting of Jan 7-8, 2022:*** In view of the fact that physical meetings and conferences are still not viable, IISA organized a virtual mini-conference in the first week of January, 2022. Close to 200 participants registered for this event, and there were three excellent distinguished lectures by Dr. Sushmita Mitra (Indian Statistical Institute, Kolkata) on analyzing biomedical images, Dr. Amy Braverman (Jet Propulsion Laboratory, NASA/Caltech) on remote sensing, and Dr. Weidong Zhang (Sana Biotechnology) on precision medicine. A short course on Introduction to Python for Statisticians was also conducted, and there were several contributed presentations. Further details can be found elsewhere in this newsletter.

- ***IISA-2021 conference:*** IISA very successfully organized its annual conference virtually in May of 2021.Since this has been a few months ago, detailed reports on this conference had been published earlier, and hence not repeated here. Many thanks to Professor Sanjib Basu for taking care of the intricate logistics of hosting a virtual conference of this size, and to Dr. Saonli Basu and her team for organizing the scientific program of this conference.

- ***IISA activities at the Joint Statistical Meetings (JSM):*** In 2021, the Joint Statistical Meetings (JSM) were organized virtually. Dr. Saonli Basu was the IISA representative in the JSM program committee. This year, we received several exciting proposals for invited and topic contributed sessions. I urge contributed talk presenters in future JSMs to select IISA as a potential sponsor.

- ***New office bearers of IISA:*** In 2021, some of the nominated office bearers of IISA stepped down, including Dr. Chaganty Rao as the Executive Director, Dr. Sowmya Rao as the Treasurer, Dr. Jyotishka Datta as the chair of the Newsletter committee and Dr. Shyam Ranganathan as member of the Newsletter committee. Also, Dr. Sanjib Basu rotated out as the president of IISA in 2020, and Dr. Soumen Lahiri completed his tenure as a member of the Board of Trustees. We thank all of them very sincerely for the wonderful service you have provided to IISA.

  We also congratulate the new office bearers who have stepped into various roles and responsibilities in IISA. These include Dr. Sanjay Chaudhuri as the new Executive Director, Dr. Abhyuday Mandal as the Treasurer, Dr. Sayantan Banerjee as the chair of the Newsletter committee, Dr. Subhashis Ghoshal as the president-elect, and Dr. Ram Tiwari as a Trustee. We are also expecting that Dr. Debjit Biswas will soon join in as a representative of the India chapter. A very warm welcome to all of you!

My heartfelt thanks to the members who helped IISA immensely, by volunteering their services as members of the IISA Executive Committee comprising of the past president Dr. Sanjib Basu, president-elect and IISA president of 2022 Dr. Sandeep Menon, India chapter representative Dr. Isha Dewan, Executive Director Dr. Chaganty Rao, Executive Administrator Dr. Hiya Banerjee, Treasurer Dr. Sowmya Rao, Newsletter Editor Dr. Jyotishka Datta, the Board of Trustees (Dr. Soumen Lahiri, Dr. Susmita Datta and Dr. Jaya Satagopan), Membership and Outreach committee chaired by Dr. Arvind

Rao, Newsletter committee chaired by Dr. Jyotishka Datta, IISA-2021 Conference committee co-chaired by Dr. Saonli Basu, Dr. Sanjay Chaudhuri and Dr. Satrajit Roychoudhury and organized by Dr. Sanjib Basu, Young Statistical Scientist Awards committee chaired by Dr. Suhasini Subbarao, Lifetime Achievement Awards committee chaired by Dr. Amarjot Kaur, Student Paper Competition Awards committees chaired by Dr. Sujata Patil and Dr. Bodhisattva Sen, Nominations committee (Dr. Sudipto Banerjee, Dr. Isha Dewan and Dr. Satrajit Roychoudhury), Constitution Review Committee chaired by Dr. Sanjay Chaudhuri, and Dr. Subrata Kundu who helped out in innumerable ways. My tenure as president of IISA in 2021 would have been a failure without the support and help of all of you, and I deeply appreciate the help you provided by volunteering your time and effort towards IISA. I also sincerely thank several other members who volunteered as candidates for the elected positions, and our vendors and support organizations and their staff who have helped with the maintenance of the IISA website, financial accounting for IISA and many other necessary activities. Many thanks!

Ansu Chatterjee (Past President of IISA in 2021)

University of Minnesota and the National Institutes of Health (NIH)

Update your contact information

Our membership portal is active now (https://www.intindstat.org/login). Members can login using their registered email addresses and update their profiles.

IISA-2022 Meeting Scientific Program Information

The next conference of the International Indian Statistical Association (IISA) will take place on December 26-30, 2022, at the campus of the Indian Institute of Sciences (IISc), Bangalore, India. The scientific committee responsible for building the conference program consists of Subhashis Ghoshal (chair), Shailaja Suryawanshi, T. V. Ramanathan (co-chairs), Bhaswati Ganguli, Peihua Qiu, Pierpaolo De Blasi, Bibhas Chakraborty, Kingshuk Roy Choudhury, Abdus Wahed, Kaushik Jana, Moumanti Podder, Arusharka Sen, Vishwanath Iyer, Dootika Vats, Peter Müller, and Aarti Singh. The conference program will consist of four plenary talks, eight special invited talks, three or four panel-discussion sessions, about sixty invited talk sessions, many contributed talk sessions, and a student poster competition. In addition, some short courses on a few important topics of current interest will be offered for an additional fee. The topics that are presently being considered are Statistics with R programming, Precision Medicine, Bayesian Spatial Statistics, Statistical Machine Learning, Deep Learning, and Python Programming. The offering of a course depends on its demand and the available resources. The conference is planned to take place in the traditional face-to-face format with the hope that the Covid-19 pandemic will be effectively over, but a provision for a hybrid mode may be available for participants not able to or not willing to travel.

The R. R. Bahadur Memorial Lecture will be delivered by Soumendranath Lahiri, Washington University, St. Louis. Three other plenary talks will be given by Hao Helen Zhang from the University of Arizona, Igor Prünster from Bocconi University, Milan, and Kalyan Das from the Indian Institute of Technology, Bombay. The eight special invited talks will be presented by Kavita Ramanan (Probability), Bodhisattva Sen, Bas Kleijn, R. V. Ramamoorthi (Mathematical Statistics), Asha Gopalakrishnan, Saonli Basu (Biostatistics), Prateek Jain, Pritam Gupta (Machine Learning and Medical Statistics). A few panel-discussion sessions on hot topics and career advice are presently being planned. These sessions will tremendously benefit especially young researchers looking for directions and guidance. There will be approximately sixty invited sessions on a coherent topic, each consisting of three speakers. Some of these sessions will be organized by a scientific committee member. The rest will be organized by others. A solicitation for submitting an invited session proposal will be sent shortly. In addition, participants may submit a proposal to present a contributed talk or a poster. Students and younger researchers presenting posters are eligible to compete for a prize with a cash award.

A prize and award ceremony will be followed by a banquet. The conference is expected to be attended by several hundred participants. It will offer opportunities to meet with familiar people as well as with many other researchers from all over the world.

-Subhashis Ghoshal
Professor of Statistics, North Carolina State University
Chair, IISA-2022 Scientific Committee

IISA 2022 India Meeting

The IISA 2022 India Meeting will be held in the Indian Institute of Science (IISc) Bangalore from 27-th to 30-th December, 2022. IISc is located in the northern part of the city of Bengaluru, the IT Capital of India. Bengaluru is India's hub of high-tech companies (in aerospace, electronics, and information technology), educational and research institutions and numerous start-ups.

IISc was established in 1909 by a visionary partnership between the industrialist Jamsetji Nusserwanji Tata, the Mysore royal family and the Government of India. Over the last 113 years, IISc has become India's one of the most premier institutes for advanced scientific and technological research and education. In 2018, IISc was selected as an Institution of Eminence (IoE)

by the Government of India, and it consistently figures among the top Indian institutions in world university rankings. The Institute's research output is diverse, interdisciplinary and cuts across traditional boundaries. It has over 42 academic departments and centres, 500+ faculty members and 4800+ students. The Institute has a vibrant and diverse campus spread over 440 acres of greenery.

The conference will be held in the National Science Seminar Complex (NSSC), which is located in the southern end of the campus. The NSSC comprises the main J N Tata Auditorium (JNTA), which has a capacity of 750 seats, and three additional smaller auditoria for parallel sessions of capacities 120, 90 and 60 seats each. The NSSC also has a banquet area including an outdoor backyard.

Report on IISA Virtual Mini-Conference (January 7-8, 2022)

IISA conducted a very successful virtual mini-conference on January 7-8, 2022. Professor Jyotishka Datta of Virginia Tech chaired the program committee of this conference. The conference was organized free of charge to provide greater access to statisticians and data scientists, and had close to 200 registered participants from both industry, and academia with a significant proportion identifying as students at different level (undergraduate/graduate/PhD student). There were three distinguished lectures, a short course on "Introduction to Python for Statisticians" and several contributed presentations in this conference.

The distinguished lecture were delivered by:

- **Dr. Sushmita Mitra,** Indian Statistical Institute**,** (Talk title: *"Intelligent Analysis of Biomedical Images")*

- **Dr. Amy Braverman,** Jet Propulsion Laboratory, NASA **,** (Talk title: *"Uncertainty Quantification for Remote Sensing Data Products Used in Climate Science and Applications")*

- **Dr. Weidong Zhang,** Sana Biotechnology, (Talk title: "Advancing Drug Development – a Precision Medicine Approach")

There were a total of three contributed sessions with 15 speakers, primarily from India and US-based institutions and companies, who presented on a wide range of topics, ranging from design of experiments, reliability, spatial statistics, deep learning, algorithmic fairness, finance and Bayesian methodology.

IISA will work with the speakers and presenters to check if some of the recorded portions of this virtual conference can be publicly shared with members.

The International Indian Statistical Association (IISA) is pleased to announce that the winners of the Young Statistical Scientist Award (YSSA) for 2021 are:

1. Dr. Parthanil Roy of Indian Statistical Institute-Bangalore in the Theory and Methods track,

2. Dr. Abhirup Datta (Johns Hopkins University) and Dr. Anindya Bhadra (Purdue University) jointly in the Applications track.

We congratulate Dr. Bhadra, Dr. Datta and Dr. Roy for their exciting and inspiring research and their contribution to our professions and disciplines!

The award winners' research profiles are given below:

Profile: Abhirup Datta

Dr. Datta develops spatial statistical methods for geographically-indexed data and Bayesian methods for complex multi-source epidemiological data. Beyond these central themes, Dr. Datta's work spans diverse and multiple areas including general statistical methodology and theory for high-dimensional data and distribution-valued data. His work has been published in leading statistical and scientific journals like the Journal of the American Statistical Association, Annals of Statistics, Annals of Applied Statistics, Biometrika, Biometrics, and Proceedings of the National Academy of Sciences. His methods work is being heavily utilized in his extensive collaborative endeavors in the areas of *environmental health, infectious disease epidemiology, international health, forestry, ecology, and neuroimaging*.

Dr. Datta's research in spatial statistics concerns developing computationally scalable and interpretable statistical and machine learning methods for large geospatial datasets that are ubiquitous in diverse fields such as air pollution epidemiology, climate sciences, and infectious disease modeling. Dr. Datta has developed *Nearest Neighbor Gaussian Processes (NNGP)* for large-scale spatial analysis that drastically reduces the computation complexity of Gaussian Process (GP) models – a staple for spatial data analysis. NNGP and its subsequent extensions have become one of the most widely used classes of models for analyzing large geospatial data. Dr, Datta has used NNGP models in different applications to create high resolution maps of air pollutants in Europe and of forest canopy heights in Alaska at an unprecedented scale (using data from more than 5 million locations). He co-led a large collaborative effort on global-scale mapping of plant traits using data from the world's largest plant trait database.

Dr. Datta has also developed novel machine learning (ML) models for several types of spatial data, with the common goal of improving interpretability of ML for spatial analysis. Applications of ML methods like Random Forests (RF) for spatial data, while being progressively common among environmental and atmospheric scientists, have largely ignored the spatial correlation. Dr. Datta showed that such naïve application of ML algorithms, ignoring spatial correlation, is sub-optimal. He has developed theory and methodology for novel tree- and forest-based learners for spatial (and more generally, dependent) data that explicitly account for the data correlation to considerably improve estimation and prediction. Dr. Datta has also worked on multifaceted applications of graphical models for improving interpretability and reducing computational burden of spatial models for infectious disease mapping and multivariate spatial analysis. Dr. Datta's research as a Principal Investigator on high-dimensional spatial data is funded by a grant from the Division of Mathematical Sciences at the National Science Foundation.

Dr. Datta also works on developing Bayesian models tailored to complex datasets typically arising from epidemiological field studies. Dr. Datta has developed novel Bayesian methods for estimating sizes of stigmatized and hard-to-enumerate key populations in the HIV epidemics like men having sex with men (MSM) and female sex workers (FSW) using multi-source, misaligned and incomplete data.

He has developed model-free Bayesian machine learning methods for improving cause-specific mortality estimation in using *Verbal autopsies (VA)* — the predominant tool for mortality cause diagnosis in low-and-middle-income countries (LMICs) where medical autopsies are often infeasible. Verbal autopsies (VA) classifiers are often highly inaccurate and uncertain, leading to bias in burden of disease estimates. The branch of machine learning concerned with accurate estimation of prevalence from imperfect classifiers is called *quantification learning*. Dr. Datta developed a model-free generalized Bayes method and theory for quantification learning. The method uses multiple data sources on causes-of-death that can be used to correct for bias in VA data and generate accurate cause-specific mortality estimates for public health policy-making. Dr. Datta has recently been awarded a

grant as a Principal Investigator by the Bill and Melinda Gates foundation to expand on this work for broader application to improve global mortality estimates.

Profile: Anindya Bhadra

Anindya Bhadra is Associate Professor of Statistics, Purdue University and Life Member of the International Indian Statistical Association (IISA). His main research focus is on the development of Bayesian methods for analyzing data that are high-dimensional and data that display complex interactions (e.g., multivariate with mixed discrete-continuous nature or with non-normal marginals). In particular, he has contributed substantially to the current understanding of **global-local shrinkage** approaches, which remain the current state of the art in high-dimensional Bayesian methodology; and their deployment to complex settings, such as in Gaussian graphical models.

Another, more recent, research interest of Anindya lies in **Gaussian process models with applications to geostatistics and deep learning**, which are topics of great contemporary interest. In the past, he also worked on simulation based maximum likelihood methodology for hidden Markov models with analytically intractable likelihood. For his methodological research, Anindya has been continuously funded as a Principal Investigator by the US National Science Foundation since 2016.

Anindya also has diverse applied research interests and has collaborated with epidemiologists, geneticists and nutritionists. He is currently involved as a Co-Principal Investigator on two projects funded by the US National Cancer Institute, with a team of nutrition scientists and electrical engineers at Purdue. One project looks at the development of a nutrient index (a numeric measure of diet quality) combining all sources of food and dietary supplements (traditional research only focused on food but ignored supplements, commonly used by a large number of Americans). The second project investigates whether the *timing* of food intake and physical activity also has a quantifiable effect on health outcomes, in addition to the more well-known effects of quantity and quality of diet and physical activity.

Anindya serves the profession of statistics in various ways, the most prominent being his current associate editorship in four journals: *Journal of the American Statistical Association, Theory & Methods (2020-present), Journal of Computational and Graphical Statistics (2021-present), Statistical Analysis and Data Mining (2021-present), and Sankhya A (2018-present).* He served on the Scientific Program Committee of the 2019 IISA International Conference in Mumbai and has given talks and organized invited sessions at several IISA conferences, including a Young Researchers Special Invited Talk at the 2015 IISA International Conference in Pune. He has advised or co-advised three current or former PhD students, some of whom have won highly selective awards, such as the *2022 ENAR Distinguished Student Paper Award*. Anindya is an elected member of the International Statistical Institute.

Profile: Parthanil Roy

Prof. Parthanil Roy is a probabilist whose research focuses mainly on stable random fields and their connections to ergodic theory, hyperbolic geometry and operator algebra. Stable processes arise as scaling limits of sums of independent copies of stochastic processes with heavy tailed marginals. Rosinski (1995) showed that any stationary symmetric stable random field indexed by a countable group possesses an integral representation that is fully determined by a quasi-invariant action of the indexing group, a function and a cocycle. The ergodic theoretic properties of this group action are strongly connected to various probabilistic aspects of the corresponding stable field. Investigating this connection has been one of the major themes of Prof. Roy's research. In particular, he has successfully studied large deviation issues, extremal properties, mixing features, path properties and statistical aspects for stable random fields and associated them with various dynamical properties of the underlying group action. In this regard, he and his co-authors have recently solved an open problem on the path properties of stable random fields mentioned in the paper of Xiao (2010) confirming a conjecture of Samorodnitsky (2004). Prof. Roy has also discovered new links between stable fields, hyperbolic geometry and von Neumann algebras.

Another recent paper of Prof. Roy has dealt with extreme value theory in the context of continued fractions. Using techniques from probability theory, ergodic theory and analysis, he has given an upper bound for the rate of convergence of the exceedances of digits obtained from the regular continued fraction expansion of a number chosen randomly from (0,1) according to the Gauss measure. This has significantly improved the best known upper bound on the rate of convergence of the maxima in this case.

Prof. Roy has also written a series of papers on branching random walks with heavy-tailed step-sizes. These papers have investigated the point process sequence of properly scaled positions of branching walk particles whose displacements are regularly varying. It has been shown by Prof. Roy and his collaborators that this sequence of point processes converges weakly to a Cox cluster process, which satisfies a superposability property. This has verified two related conjectures of Brunet and Derrida (2011) in this setup.
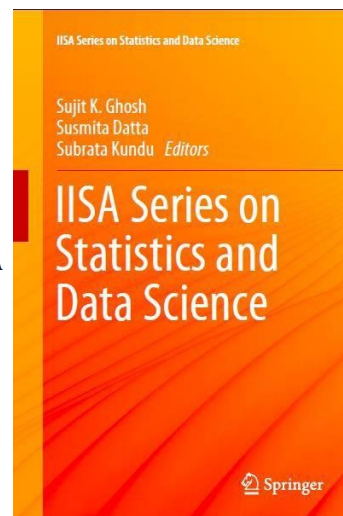
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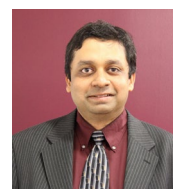**Submit your proposal for a new monograph or contributed volume in this series**

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Member News

- Prof. Dipankar Bandopadhyay, a life member of the IISA, was awarded the inaugural 2021 Dayanand Naik award at the Fall Chapter Meeting of the Virginia Chapter of the American Statistical Association. More info in the link below: https://biostatistics.vcu.edu/news/bandyopadhyay-receives-inaugural-dayanand-naik-award/

- Dr. Prafulla Kumar Swain, Assistant Professor, Department of Statistics, Utkal University, India has joined as Academic Editor in PLOS One journal.

- Dr. R. Gangai Selvi, Associate Professor Statistics), TNAU, Coimbatore, Tamil Nadu - Developed TNAU Statistics Quiz Android Mobile App for ICAR competitive exams. Dr. Selvi also authored a textbook titled "Applied Statistics".

- Abhirup Datta, Department of Biostatistics, Johns Hopkins University was awarded the ENVR early investigator award 2021 for "key contributions to statistical theory and methodology for the analysis of large spatial and temporal data and their application to substantive problems in the environmental sciences."

Upcoming Conferences and Workshops

1. The seventh conference and workshop on Statistical Methods in Finance aims to expose the participants to new and active areas of research and to engage researchers into active working groups. The conference will be jointly hosted by
   - Chennai Mathematical Institute (CMI),
   - Indian Statistical Institute, and
   - North Dakota State University

on virtual platform from June 28th to July 2nd, 2022 on the virtual platform..
Further details are available on the webpage
https://statfin.cmi.ac.in/2022/

For the conference Ph.D. students, post-doctoral researchers, and faculty
in mathematics, statistics, computer science, business, economics, finance, and physics
are eligible to apply. Participants from the industry are encouraged to apply with a
paper to be considered for presentation in the contributed paper sessions.

The workshop on "Artificial Intelligence in Finance" is open to all
students, undergraduate and above as well as industry participants, in addition
to researchers and faculty.

Abstracts for contributed talks will be accepted until May 15, 2022.