Personal Photographic Glimpses of Professor Bikas Kumar Sinha: Bikas Kumar Sinha Endowment Lecture

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Abstract

My goal in this Endowment Lecture is to provide some glimpses of Professor Bikas Sinha, based on 30 years of friendship and appreciation. In particular I'll emphasize Bikas' remarkable impact as a demanding but inspiring mentor and collaborator of several doctoral students of Tampere University; among them, Arto Luoma, Laura Koskela, Anne Puustelli, Klaus Nordhausen, Jarkko Isotalo and Sami Helle; and extremely active and productive co-operation with Erkki Liski and Tapio Nummi and their research group.

On my personal side I'll go through, with photographic illustrations, some highlights like visiting Bikas' residence and family in Kolkata on the 3rd of January 1995; visits to our home in Nokia; international scientific meetings like in Kolkata, Hyderabad and in Będlewo, Poland, and the guided tour in Kolkata Botanical Gardens on the 2nd of January 2013.

Key words: Design of experiments; Linear models; Indian Statistical Institute; Calcutta University Department of Statistics, Tampere University.

AMS Subject Classifications: 62K05.

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1. Introduction: Spring 1993

An Afternoon Full of Experimental Design, by Professor Bikas Kumar Sinha, Indian Statistical Institute, Calcutta, Wednesday, 14 April 1993, 12:15–16:00, Lecture Room C VII, University of Tampere:

Optimality Aspects of Experimental Designs

"I plan now to give a very lucid account of the concept of optimality in experimental designs. I will make a survey of all the available results, explaining their historical perspectives and the necessity underlying the continued research that has taken place in the last forty years. Of course, Weighing Designs is one of my very favourite topics and I would like to spend some time on this fascinating area."

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That was the email I circulated around Southern Finland in early April 1993. What was going to happen—the first lecture that Professor Bikas Sinha delivered in Finland, so it was a premier for many talks to be given by him in Finland. The most recent one, if I'm not mistaken, was on 2 November 2017, with the title "ꜰ ᴀᴍ ɴᴏᴛ ʟɪᴄᴋᴇᴅ —The Twelve Penny Problem with Applications". And, between those 24 years, there were several talks and short courses with varying titles.

Bikas: it's an Olympiad from your latest tour to Finland! Clearly time to come back.

On 6 April 1993 Bikas sent the following email:

> Dear Simo . . . Thanks for your e-reply. I got Finland Visa. That means I am all set now. I will reach Helsinki on April 11 (Sunday) in the afternoon at about 3 pm. Any suggestion for convenient train for Tampere? Fare? Currency exchange rate? Where to get down in Tampere and how to go to the University Campus? Accommodation at ???? Let me know all this. Thanks . . . Bikas.

Below is a part of my reply:

> I think that you probably will catch the 17:00 train. So I will come to the Tampere train station at 18:48. If I don't see you then, I will come again at 20:02. [*That's when we actually met.*] . . . At the Tampere train station, please wait in the platform, just where you come out of the train, I'll meet you there. –Simo

Then in Tampere, during Bikas' stay in April 1993, I had to be away three days due to a conference trip. Later, in an interview by Tapio Nummi (Tapio is Bikas' long-standing co-researcher) in Tampere in November 2017, Bikas described his first visit to Tampere [incl. my absence] as follows:

> I thought within myself: I am not going to sit down in one corner office and prove some theorems for myself! I must know what others are doing here. So next morning with a cup of hot tea in my hand, I knocked at the door of one faculty . . . without having any prior knowledge about him/her at all . . . absolutely nothing . . . leaving it to the "chance" !!!
>
> And it turned out that I had entered into Professor Erkki Liski's room. . . . He was to be my co-author for the next 10–12 years with some doctoral students at his disposal. . . . he was the first I started interacting with very successfully.

The above events are descriptive characters of Bikas' academic and social career: his energy and open-mindedness are his mental eigenvalues, so to say. My goal in this Endowment Lecture is to provide some glimpses of Bikas, based on 30 years of friendship and appreciation. In particular I'll emphasize Bikas' remarkable impact as a demanding but inspiring mentor and collaborator of several doctoral students of Tampere University; among them, Arto Luoma, Laura Koskela, Anne Puustelli, Klaus Nordhausen, Jarkko Isotalo and Sami Helle.

On my personal side I'll go through, with photographic illustrations, some highlights like visiting Bikas' home and family in Kolkata in early January 1995, meetings at our home in Nokia, international scientific meetings like in Hyderabad and in Będlewo/Poland, and the guided tour in Kolkata Botanical Gardens in early January 2013.

2.   Bikas' Research Experience

Bikas' research experience can be broadly divided into three phases:

- As a Research Scholar (1968–1971) and the youngest Faculty Member in the Calcutta University Department of Statistics, CUDS, (1972–1975).

- As a Faculty at the ISI, Indian Statistical Institute, Kolkata (1979–2011). Bikas regards CUDS and ISI as his Home Grounds.

- As a regular visitor (for long and short terms) in some universities in the USA, Canada, Germany, Finland, Poland and Thailand since 1982 till date. Since 1979, close interactions with the Faculty at the Home Grounds.

The Home Ground of Bikas' twin brother Bimal Kumar Sinha, has been the University of Maryland, Baltimore, USA, since 1985.
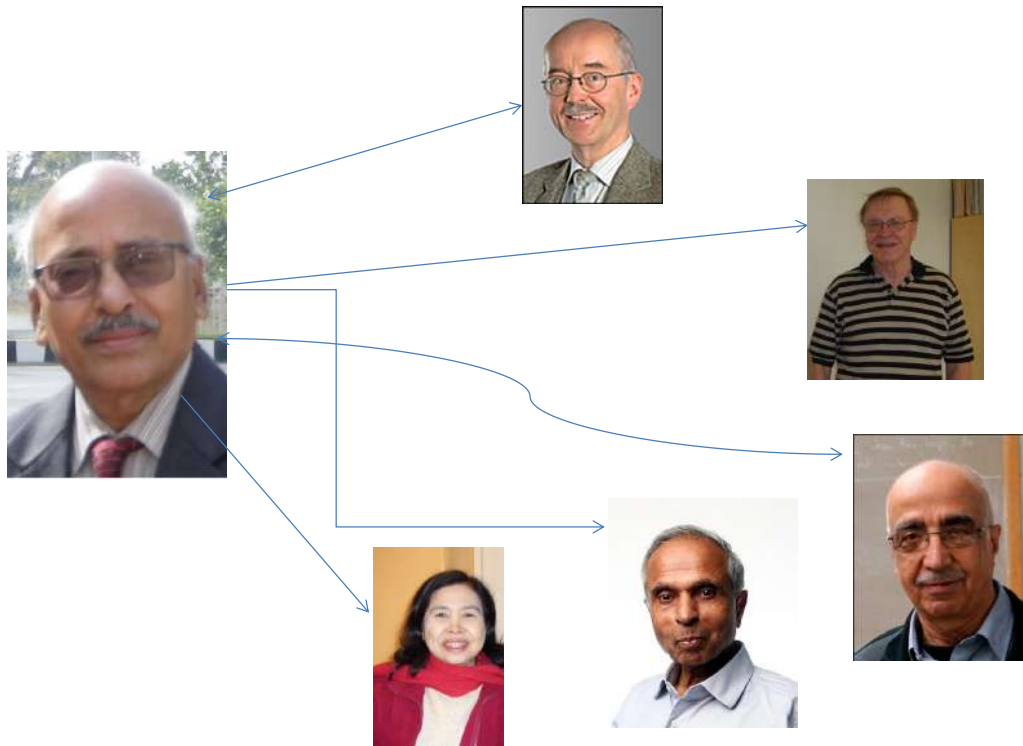
I don't go through in details the impressive scientific career of Bikas; there are excellent sources for that, see, e.g.,

- 2020: *Statistics and Applications*, Journal of the Society of Statistics, Computer and Applications, Vol. 18, No. 2. Special Issue "Challenges and Opportunities in Statistical Data Designing and Inference in the Emerging Global Scenario" in honour of twin statisticians (brothers) Bimal and Bikas Sinha on their 75th Birthday (16 March 2021). *Combined Issue pdf.*

- 2020: The Sinha Brothers (Bimal and Bikas)—The Twin Statisticians. Pages xi–xxx, in *Statistics and Applications*, Journal of the Society of Statistics, Computer and Applications, 2020, Vol. 18, No. 2. PDF.

- 2001: Bio-Sketch of Bikas K. Sinha. *American Journal of Mathematical and Management Sciences*, 21, 3–4, 222–225, DOI.

In particular, Bikas himself has prepared an outstanding summary of his career and collaborators: *Bikas Sinha Collaborators PPT October 2021.pptx.*

Believe or not but he has had about 111 collaborators by October 2021!

Main Networks outside Home Ground

Figure 1: Montip Tiensuwan, Kirti R. Shah, A. Samad Hedayat, Erkki Liski, Friedrich Pukelsheim. [Source: BKS's Collaborators PPT]
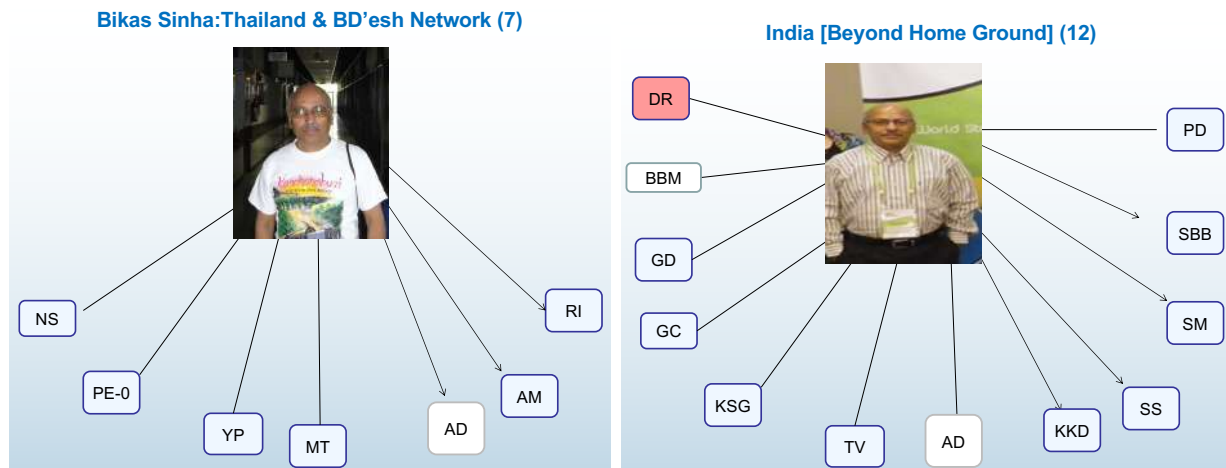

Figure 2: "I have been really fortunate to have the ability to develop good personal relationship in no time . . . my collaborators have mostly been very reasonable and accepted me the way I have been." [Source: BKS's Collaborators PPT]
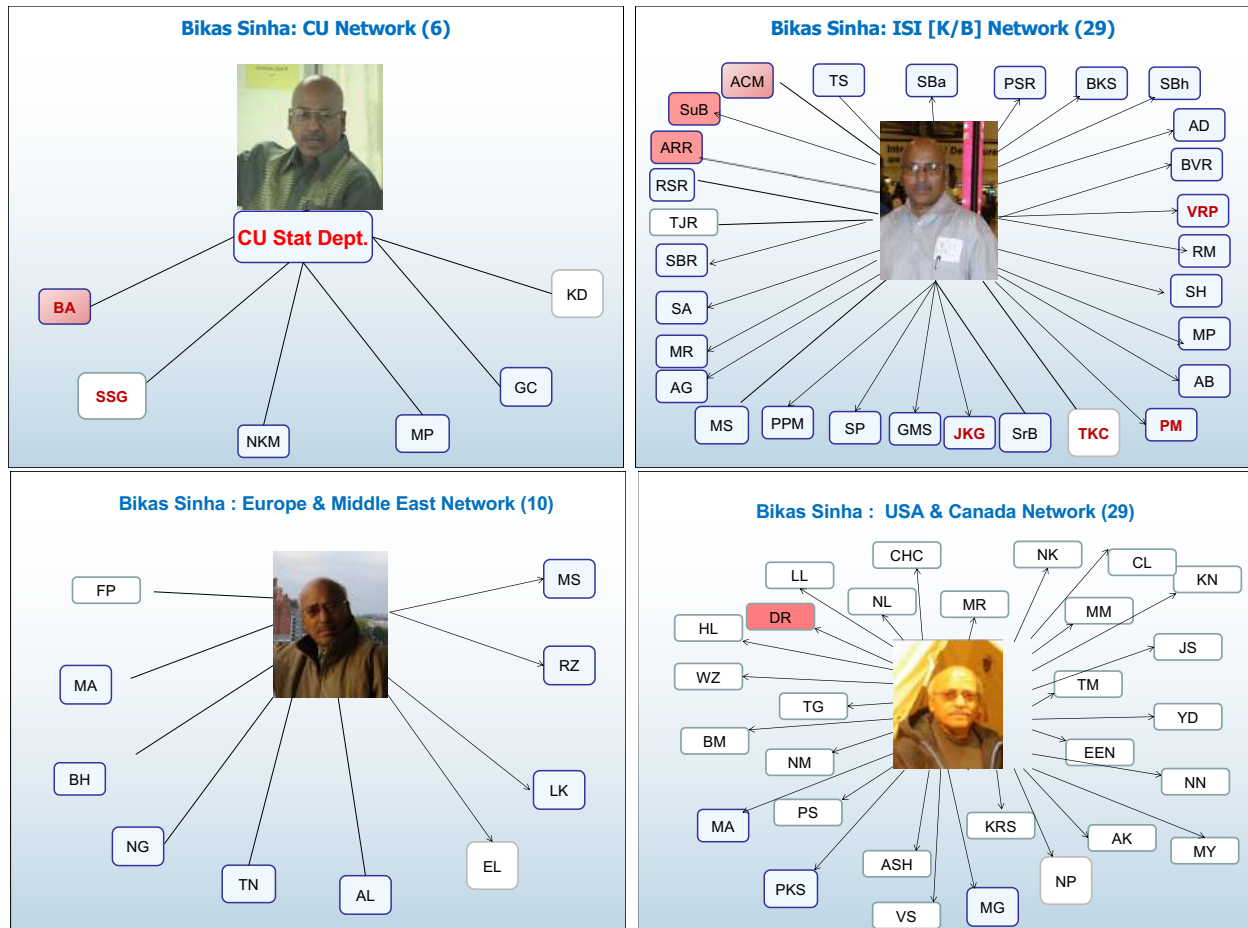
Figure 3: "You have contributed towards my understanding of the research problems, techniques to be developed and the solutions thus arrived at." [Source: BKS's Collaborators PPT]

Below are excerpts from P.K. Sen's Foreword in the special issue of the *Statistics and Applications* (2020), in honour of Bimal and Bikas Sinha on their 75th Birthday.

> It is indeed a pleasure to write this Foreword note in favor of two outstanding statisticians of our time: Bimal and Bikas Sinha, whom we affectionately address as the "Statistical Twins".
>
> They were born in 1946 in the village Atgharia in Pabna District of Bengal Province in undivided India, a year before the region was engulfed in the newly created East Pakistan (which later gave birth to Bangladesh in 1971 December).
>
> The Sinha family migrated to Kolkata, West Bengal, India, in 1958 when they were just 12 years old.
>
> For 12 years to follow, they had hard economic time, albeit both Bimal and Bikas excelled in their college education and earned their Ph.D. degrees in Statistics in 1972–1973 under the able guidance of [Late] Professor Hari Kinkar Nandi in Calcutta University. . . . During the past fifty years their research and organizational accomplishment may simply be categorized as outstanding.

3.   1995–2006: Bikas' Residence and Other Stories

As mentioned in Section 1, my first contact with Bikas took place in Kolkata in February 1993. Luckily I had opportunity to visit Kolkata soon again in December 1993 and over the new year's period 1994–1995.
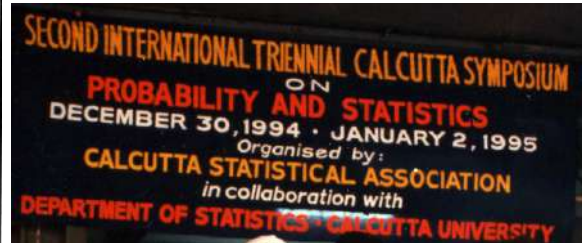

Figure 4: Timetable for Kolkata, 25 Dec 1994–10 Jan 1995. *Second International Triennial Calcutta Symposium on Probability and Statistics.* Accompanied by a good group of colleagues like Friedrich Pukelsheim and Götz Trenkler.

Figure 5: Pritha (= Mrs BKS), Karabi (= daughter of BKS), right: Kuver (= son of BKS); Bikas' residence, 3 January 1995.
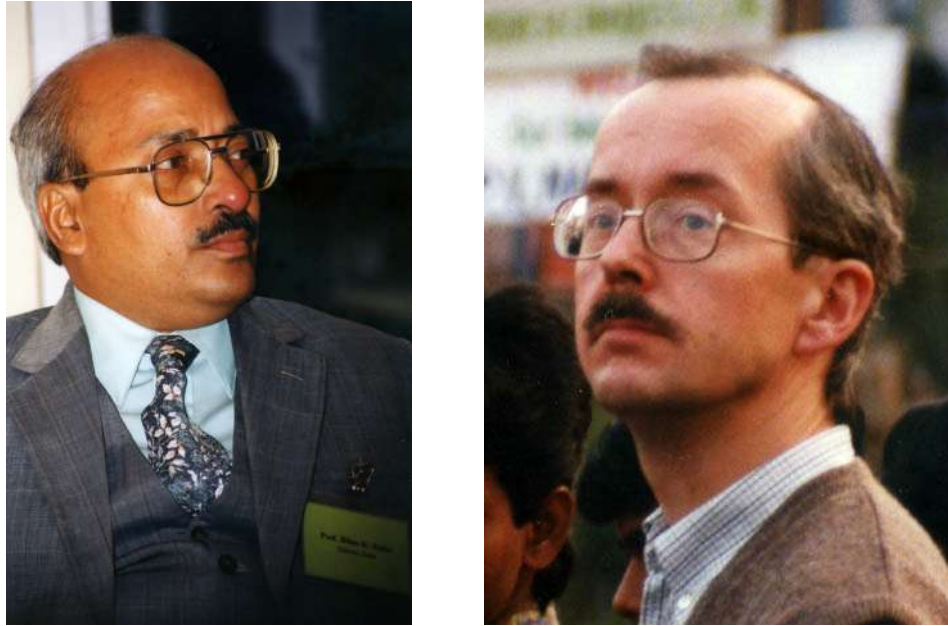
Figure 6: On the 3rd of January 1995, in Bikas' residence, Bikas himself was performing, singing to us (incl. Friedrich Pukelsheim). I took a video but could not find it . . . excellent singing, Bikas!

Figure 7: Pritha, Karabi and Kuver Sinha: train from Delhi to Joypur, 1989. — Pritha Sinha has been a housewife with devotion to nurturing the children, Karabi and Kuver. She holds Master's Degree in Education from Calcutta University. Only recently she completed a Certificate Course in Psychiatric Counseling and got absorbed as a Psychiatric Counsellor in one NGO, called Sanlaap. [Ph: BKS]

Figure 8: Karabi Nandy, née Sinha, is currently an Associate Professor at the University of Texas Southwestern Medical School (Clinical Sciences and Biostatistics).

PhD in 2004, from the University of Florida, Gainesville, supervisor Professor Malay Ghosh. The thesis was entitled *Some Contributions to Small Area Estimation.* [Ph: BKS]

Figure 9: Kuver Sinha has been in the USA since 2001. PhD in 2008 from Rutgers University, USA; thesis: *Supersymmetry Breaking in Gauge Theories and String Theory.* Currently he is the Carl T. Bush Chair Professor of Astro-Physics at Oklahoma State University.

"I study the first three minutes of the history of the Universe (we've zeroed things down to the first three seconds)".

In late 1990s my daughter Anna made an interesting interview of Kuver to *Aamulehti*, a local newspaper in Tampere. Too bad, I could not find this interview anymore. [Ph: BKS]
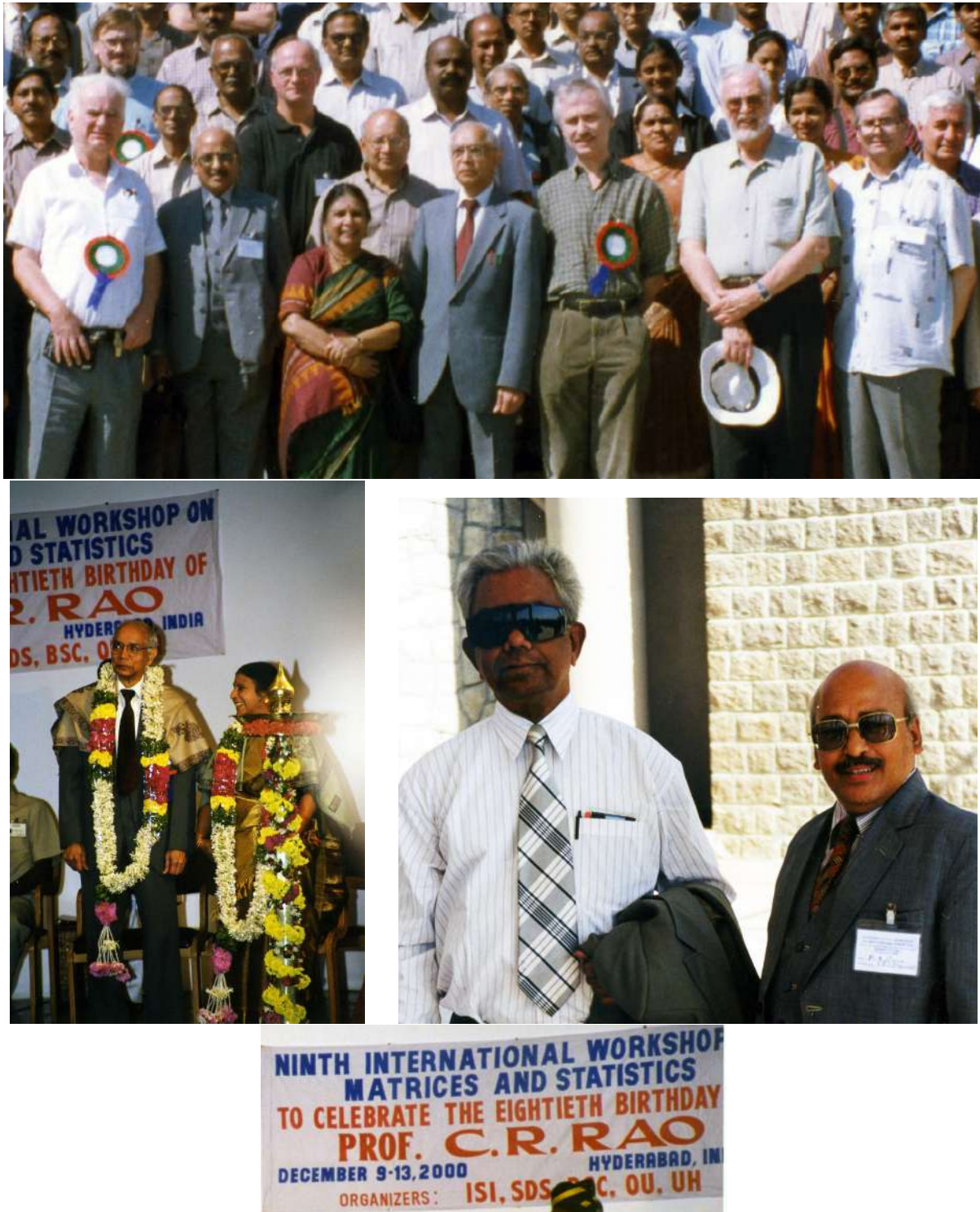
Figure 10: *The 9th International Workshop on Matrices and Statistics*, Hyderabad, 9–13 December 2000, celebrating C.R. Rao's 80th birthday. In the group photo you can catch George P.H. Styan, Bikas, Götz Trenkler, Mrs Rao, C.R. Rao, H.J. Werner, Gene Golub, Jerzy K. Baksalary, Fikri Akdeniz; Bikas with Somesh Dasgupta. Program.

Figure 11: Roman "Robin" Zmyślony and Bimal K. Sinha, Będlewo, Poland, 21–27 August 2003, *LinStat/StatLin Conference.* Program.

Figure 12: Tampere, 2 September 1983. You may catch Johan Fellman, Erkki Liski, Gustav Elfving, Tarmo Pukkila, Bill Farebrother, C.R. Rao, and Bimal K. Sinha (only 50 % visible). Conference in Linear Models in Tampere, 30 August – 2 September 1983. Bimal's talk: "Robustness in linear models" (joint with Hilmar Drygas). Program. Proceedings.

Figure 13: Bikas and Bimal. Bimal or Bikas? [Ph: BKS]

Figure 14: Bikas and Bimal with C.R. Rao and Kirti R. Shah, 2018. [Ph: BKS]

Universal optimality for the joint estimation of parameters

Kirti R. Shah & Bikas K. Sinha

Abstract. The concept of universal optimality is applied to the joint estimation of sets of parameters and it is shown that optimality for the joint estimation implies optimality for the estimation of the individual sets of parameters. This result is applied to some special settings of interest which leads to some new optimality results in these settings.

Figure 15: Contribution to the *Festschrift* for Tarmo Pukkila, Tampere, June 2006.

Figure 16: Bikas, Ingram Olkin, Augustyn Markiewicz, Ludvig Elsner, Yongge Tian. *The 13th International Workshop of Matrices and Statistics*, Będlewo, Poland, 19–21 August 2004. Program.

4.   2006–2007

Email from Bikas Sinha, 27 November 2006.

> Dear Erkki and Simo: Greetings from Kolkata !
>
> You will be glad to learn that my daughter Karabi is getting married next week Tuesday . . . Dec. 4th . . . here in Kolkata. The Groom is also from Kolkata . . . studied at ISI . . . PhD from Washington State University, Seattle, and currently a Faculty at UCLA.
>
> Bikas
>
> PS: Hope to see Simo in Kolkata and Hyderabad.

• Linear Models & Generalized Inverses:
Organizer: **Dibyen Majumdar**
Speakers: **Simo Puntanen**
Thomas Mathew
Bhramar Mukherjee
Sumanta Adhdhya
Chair: **Dibyen Majumdar**

• Measurement Error,Biostatistics Dimension reduction:
Speakers: **Karabi Sinha**
Apratim Guha
Rahul Bhattacharyya
Abhijit Mandal
Chair: **Gudio Knapp**

"**Finally, to the one who champions me through everything, to the one I look up to for everything, to my** father, to Baba**, I owe everything.**"
—*Thesis Preface / Karabi*

Figure 17: *The 6th Triennial CCU Symposium*, 29–31 December 2006. Program.

I recall that in 2004 or 2005 Bikas and Karabi were visiting Tampere and Bikas wanted to celebrate Karabi's thesis by taking our whole dept group for dinner to Restaurant Näsinneula: providing spectacular views!

Notice the excerpt from the Preface of Karabi's Thesis.

Figure 18: Bikas rushing into the group photo. (He occupied the red chair and I took the next one, behind my backback.) *The 6th Triennial CCU Symposium*, 29–31 December 2006.

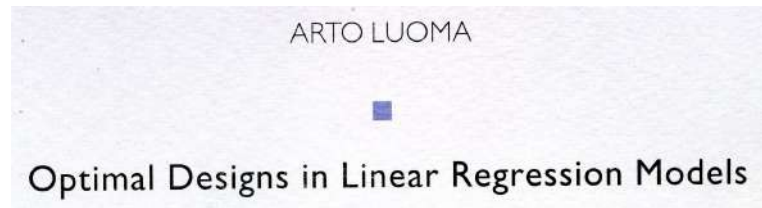**Figure 19:** Hooghly River, an arm of Ganges. December 2006.

Figure 20: RB Bapat, P Bhimasankaram, JK Ghosh, K Krishnamoorthy, D Majumdar, S Malik, T Mathew, AR Meenakshi, SJP, BLSP Rao, P.S.S.N.V.P. Rao, SB Rao, D Sengupta, KR Shah, Bikas Kumar Sinha. *S.K. Mitra (1932–2004) Memorial Meeting,* Hyderabad, 6–7 January 2007. Report in *Image.*

Figure 21: Above: Debasis Sengupta, Bikas, Dibyen Majumdar. Below: Kirti R. Shah, Thomas Mathew. Hyderabad, 6 January 2007.

5.   Mentor in Tampere

Let's have a glance at Bikas' remarkable impact as a demanding but inspiring mentor and collaborator of several doctoral students of Tampere University; in particular, Arto Luoma and Laura Koskela.

List of original papers

1 Liski, E.P., Luoma, A. and **Sinha**, Bikas K., (1996). Optimal Designs in Random Coefficient Linear Regression Models. *Calcutta Statistical Association Bulletin*, 46, 211–230.

2 Liski, E.P., Luoma, A., **Mandal**, N.K. and **Sinha**, Bikas K. (1998). Optimal Designs for Prediction in Random Coefficient Linear Regression Models. *Journal of Combinatorics, Informatics and Systems Sciences*, 23(1–4), 1–16.

3 Liski, E.P., Luoma, A., **Mandal**, N.K. and **Sinha**, Bikas K. (1997). Optimal Design for an Inverse Prediction Problem under Random Coefficient Regression Models. *Journal of the Indian Society of Agricultural Statistics*, XLIX, 277–288.

4 Liski, E.P., Luoma, A., **Mandal**, N.K. and **Sinha**, Bikas K. (1998). Pitman nearness, distance criterion and optimal regression designs. *Calcutta Statistical Association Bulletin*, 48(191–192), 179–194.

5 Liski, E.P., Luoma, A. and Zaigraev, A. (1999). Distance optimality design criterion in linear models. *Metrika*, 49(3), 193–211.

Below is an excerpt from the Preface of Arto Luoma's Thesis, 25 May 2000.

> I had my first contact with the subject of my thesis in summer 1994 when Professor **Bikas Sinha** from the Indian Statistical Institute visited our department. He had already cooperated with my supervisor **Erkki Liski** in experimental design and I had a joy to read one of their joint articles. They also welcomed me in their research group.
>
> In summer 1994 the preliminary drafts of the three first papers of the thesis were written. They provided a basis on which some future work could be done. It was a credit to Professor Sinha that he was able to formulate the problems in such a form that they could be dealt with. However, it was not easy to find complete solutions to some problems
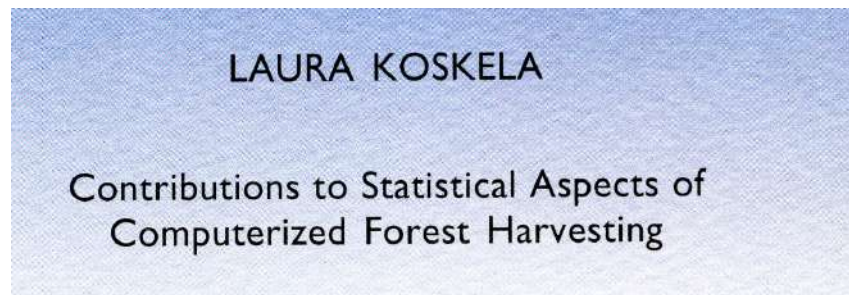
which seemed simple at the outset. There was also a third person to join our research group, Dr. **Nripesh Mandal** from Calcutta University, who visited our department twice.

I am thankful to Professor Sinha who has been an example of creative scientific work and whose enthusiasm as a teacher I have admired.

Figure 22: SJP, Laura Koskela, Bikas, Jarkko Isotalo, Nokia, 5 July 2006.

Laura Koskela had her thesis defence on 29 June 2007.

List of Papers, Laura Koskela: 29 June 2007. [Photo below taken by Laura in July 2005.]

1. Koskela, L., Nummi, T., Wenzel, S., and Kivinen, V.-P. (2006). On the Analysis of Cubic Smoothing Spline-Based Stem Curve Prediction for Forest Harvesters. *Canadian Journal of Forest Research*, Vol. 36, 2909–2920.

2. Nummi, T., and Koskela, L. (2006). Analysis of Growth Curve Data Using Cubic Smoothing Splines. Submitted to *Journal of Applied Statistics*.

3. Nummi, T., **Sinha**, B.K., and Koskela, L. (2005). Statistical Properties of the Apportionment Degree and Alternative Measures in Bucking Outcome. *Revista Investigation Operacional*, 26, 3, 259–267.

4. Koskela, L., **Sinha**, B.K., and Nummi, T. (2007). Some Aspects of the Sampling Distribution of the Apportionment Index and Related Inference. Submitted to *Silva Fennica*.

5. **Sinha**, B.K., Koskela, L., and Nummi, T. (2005). On a Family of Apportionment Indices and Its Limiting Properties. *IAPQR Transactions*, 30, 2, 65–87.

6. **Sinha**, B.K., Koskela, L., and Nummi, T. (2005). On Some Statistical Properties of the Apportionment Index. *Revista Investigation Operacional*, 26, 2, 169–179.

Preface

I would also like to express my deepest gratitude to my assistant supervisor Professor Bikas K. Sinha, who has contributed immensely to my work during his regular visits to the University of Tampere.

I warmly thank him for his willingness to share his wide expertise and a number of ideas throughout the preparation of the thesis.

I am also grateful to him for arranging the opportunity to make an unforgettable and scientifically fruitful one month's visit to the Indian Statistical Institute (lSI), Kolkata, in July 2005.

Figure 23: Laura's Thesis Defence Party, 29 June 2007. Laura surrounded by Arto Luoma, Tapio Nummi, Erkki Liski, Seppo Pynnönen and Bikas Kumar Sinha.

Figure 24: It was not full-time work every day . . . cruising with Erkki in Tapio's motorboat in Näsijärvi. Tampere is between two lakes, Näsijärvi and Pyhäjärvi. [Ph: Tapio Nummi]

6.   2012–13

Here is email from Karabi Nandy, 21 August 2012:

> Dear Friends in Far Finland,
>
> We are thrilled to announce the birth of our precious baby girl, **Rukmini**, who came to this world on Tuesday, August 14th at 9:32pm. We are all doing well and having a great time together, discovering new things every minute!
>
> Attached is a picture of our baby girl.
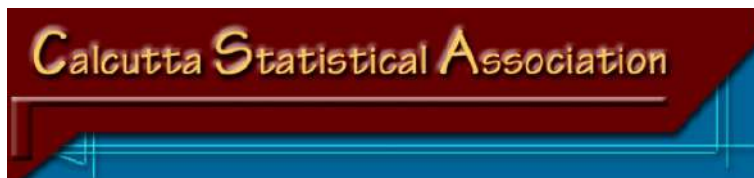>
> Warmly, Karabi and Rajesh.

Figure 25: Sooo photogenic!! [Ph: BKS]

Air India **AI-762**	*Departure* **New Delhi (DEL)** Terminal 3 Mon, 24 Dec 2012, 10:30 hrs	*Arrival* **Kolkata (CCU)** Mon, 24 Dec 2012, 12:35 hrs	Non-Stop Flight Duration: 2h 5m Non-Refundable Fare Cabin:Economy
Passenger Name	**Type**	**Airline PNR**	**E-Ticket Number**
M Simo Puntanen	Adult	JEMVQ	098-9554489938

Eighth International Triennial Calcutta Symposium
on
Probability & Statistics
December 27-30, 2012
Organizers: Department of Statistics, University of Calcutta
&
Calcutta Statistical Association.

Special Session:

R C Bose Memorial Session	Vinod K Gupta	Indian Agricultural Statistics Research Institute, New Delhi, India	Construction of efficient k-circulant multi-level supersaturated designs
	Simo Puntanen	University Of Tampere, Finland	Equalities between OLSE, BLUE and BLUP in the linear model
	Kashi Nath Chatterjee	Visva-Bharati University, Santiniketan, India	Designs for Model Selection

Figure 26: 24 Dec 2012 ⟶ CCU, to attend the *Eighth International Triennial CCU Symposium*, 27–30 December 2012. Notice the speakers of the above Special Session! Program.

Figure 27: Homegrounds of Bikas Kumar Sinha.

Figure 28: Malay Ghosh, supervisor of Karabi Sinha, using his iPhone to book us a table in *Hotel Taj Bengal* for 31 December 2012 (with Kimmo Vehkalahti).

Here is email from Bikas Sinha, Wednesday, 2nd of January 2013, Kolkata:

> Simo,
>
> . . . we are meeting around 10 *this morning* . . .
>
> I will be accompanied by Prof. **Nripes Mandal** and Prof. Mrs **Manisha Pal** . . . both of CU Statistics Department.
>
> We will contact you at the Hotel Reception.
>
> Meanwhile my family joins me in extending a very happy New Year to you and your family and friends !
>
> Bikas

Figure 29: Augustyn Markiewicz, Nripes K. Mandal, Kimmo Vehkalahti, SJP, BKS, Manisha Pal. Victoria Memorial in the background. 2 January 2013.

Figure 30: Bikas and Soile P. admiring the Great Banyan Tree (and the ISI logo), Kolkata Botanical Gardens, also known as the Acharya Jagadish Chandra Bose Indian Botanic Garden. 2 January 2013.

Figure 31: Bikas Kumar Sinha, 2 January 2013.

Figure 32: Bikas and the Statisticians Tamperensis, 30 October 2017. Tapio Nummi, Hannu Oja, Pentti Huuhtanen, Lasse Koskinen, Erkki Liski, SJP, BKS.

Statistical Design Issues for fMRI Studies: A Beginner's Training Manual

Bikas K. Sinha, Nripes K. Mandal, and Manisha Pal

The Legend of the Equality of OLSE and BLUE: Highlighted by C. R. Rao in 1967

Augustyn Markiewicz, Simo Puntanen, and George P. H. Styan

Abstract An experimental subject [patient] is presented with a mental stimulus such as a 1.5-second flickering checkerboard image or a painful heat stimulus at some of a total of n time points in the experiment. During this presentation, the patient absorbs a sequence of mental stimuli along with a provision for intermediate-resting period as well. The measurement of a brain voxel at an instant is collected by an fMRI scanner. The purpose is to examine a collection of the response profiles to understand the nature and extent of local brain activity in response to the stimuli. Functional Magnetic Resonance Imaging (fMRI) is a technology for studying how our brains respond to mental stimuli. In recent times, researchers have paid attention to "modeling" the responses in terms of sequences of mental stimuli received during

Abstract In this article, we go through some crucial developments regarding the equality of the ordinary least squares estimator and the best linear unbiased estimator in the general linear model. C. R. Rao (Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability. University of California Press, Berkeley, pp. 355–372, 1967) appears to be the first to provide necessary and sufficient conditions for the general case when both the model matrix and the random error term's covariance matrix are possibly deficient in rank. We describe the background of the problem area and provide some examples. We also consider some personal CRR-related glimpses of our research careers and provide a rather generous list of references.
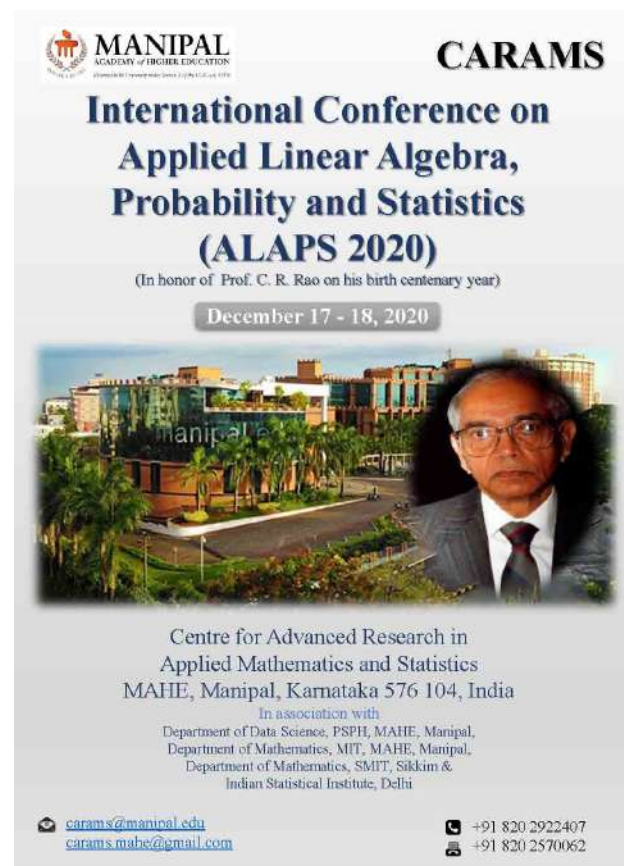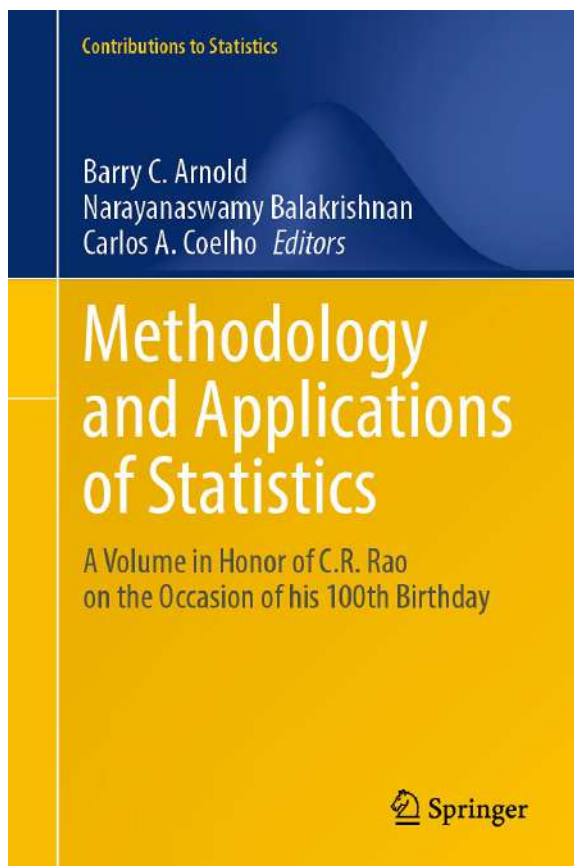
Figure 33: *Methodology and Applications of Statistics: A Volume in Honor of C.R. Rao on the Occasion of his 100th Birthday.* (B.C. Arnold, N. Balakrishnan and C.A. Coelho, Eds.), Springer, Cham. DOI of SiMaPa. DOI of MaPuSt.

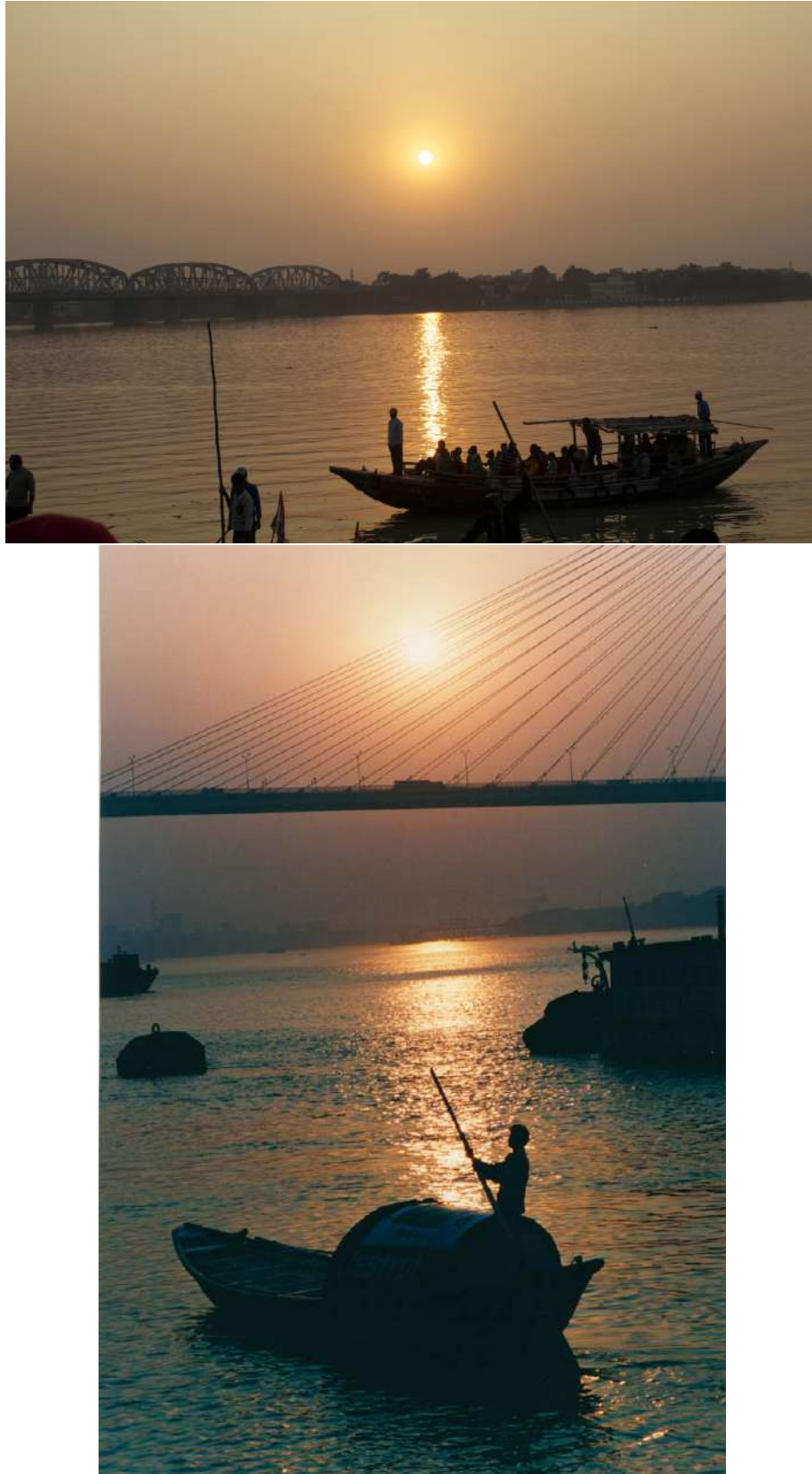In the ALAPS-2020 Conference, Bikas and I had an opportunity to perform online.

Figure 34: Sunset in Hooghly River and Howrah Bridge, Kolkata, December 1994.

Acknowledgements

References and Conference Links

Statistics and Applications (2020). Journal of the Society of Statistics, Computer and Applications, Vol. 18, No. 2. Special Issue "Challenges and Opportunities in Statistical Data Designing and Inference in the Emerging Global Scenario" in honour of twin statisticians (brothers) Bimal and Bikas Sinha on their 75th Birthday (16 March 2021). PDF

The Sinha Brothers (Bimal and Bikas) —The Twin Statisticians. Pages xi–xxx, in *Statistics and Applications*, Journal of the Society of Statistics, Computer and Applications, 2020, Vol. 18, No. 2. PDF

Bio-Sketch of Bikas K. Sinha (2001). *American Journal of Mathematical and Management Sciences*, 21, 3–4, 222–225, DOI

Bikas Sinha Collaborators PPT October 2021.pptx.

1983: The First International Tampere Seminar on Linear Statistical Models and their Applications, 30 August – 2 September 1983. Program. Proceedings.

2000: The 9th International Workshop on Matrices and Statistics, Hyderabad, 9–13 December 2000, celebrating C.R. Rao's 80th birthday Program.

2003: StatLin/LinStat Conference, Będlewo, Poland, 21–27 August 2003. Program.

2004: The 13th International Workshop of Matrices and Statistics, Będlewo, Poland, 19–21 August 2004, celebrating Ingram Olkin's 80th birthday. Program.

2006: The 6th International Triennial CCU Symposium, 29–31 December 2006. Program.

2007: Sujit Kumar Mitra (1932–2004) Memorial Meeting, Hyderabad, 6–7 January 2007. Report in *Image.*

2012: The 8th International Triennial CCU Symposium, 27–30 December 2012. Program.

2020: ALAPS-2020 Conference International Conference on Applied Linear Algebra, Probability and Statistics. Manipal Academy of Higher Education, MAHE, Karnataka State, South India, 17–18 December 2020. A virtual conference in honor of Professor C.R. Rao on his birth centenary year.