

## Personal information

### Curriculum Vitae

Age: Born 9<sup>th</sup> January 1957  
Nationality: Indian  
Family: Wife (aged 48 years, housewife) and one daughter (aged 24+ years, MA

in Mass Communication and Journalism, working professional, Carrying out PhD at IIT Guwahati).

Prof. Dr. Deb Kumar Chakrabarti  
17 may 2011



### Present position

**Professor, Department of Design, Indian Institute of Technology Guwahati**, Guwahati- 781039, (Joined IITGuwahati in 1998 December as Associate Professor) and looking after Design Ergonomics activities.

### Academic Qualification

- BSc (honours) in Human Physiology, from City College, Calcutta University, 1976; (and NCC Naval Wing "B" and "C" certificates).
- MSc in Human Physiology with specialisation in Ergonomics and Work Physiology, Presidency College, CU, 1978;
- BEd (Bachelor of Education, a PG Programme), from David Hare Training College, CU, 1985; and
- PhD in Science (Physiology, in the area of Design Ergonomics), from University Colleges of Science, Calcutta University, 1989. (PhD thesis entitled "The Ergonomic Evaluation and Design of Work Methods and Implements Used by Indian Agricultural Workers", area covered Tea Plantation and Paddy Cultivation in India)

### Total Teaching experience

30 years, since 1981 with various capacities covering various aspects of Ergonomics/Human Factors and Design at Various levels.

### Experience and position held

Worked at National Institute of Design, Ahmedabad, India, as a faculty member, 1986 June to 1998 December, position held Associate Senior Ergonomist with responsibility of coordinator Ergonomics and Vice Chairman Design Services and Research.

### Area of Specialisation: Research area and Interest

Ergonomics and Human Factors Fundamentals; Usability and Human Compatibility Factors; Design Ergonomics and Human- Product-Environment interface system; Cognitive perception and interaction ergonomics; Occupational health and safety; and Participatory Ergonomics and training.

### Publications and reports

93 publications/ reports include Journals, Conferences, Technical reports and books.

**Sponsored projects and consultancy** covering around 23 different private and Govt. sectors. Ongoing projects: **NPTEL** (sponsor **AICTE**) and **Virtual Ergonomics Lab** (sponsor **MHRD**)

**Initiated PhD programme in Design for the first time in India and framed the structure from a fully devoted Department of Design, IIT Guwahati.** The very first PhD candidate registered in 1999 and thereafter it has set an ongoing trend. **Three has been awarded PhD degree and six are pursuing under my direct supervision.**

### Others including responsibilities from time to time

Examiner, invited speaker and member in many committees with varied administrative responsibility and of many professional bodies including Bureau of Indian Standards (**BIS**) in design relevant fields and Indian Society of Ergonomics (**ISE**) with various capacity from time to time till date. Organised HWWE2005 (International ergonomics Conference, December 2005) a total 6-day event at IIT Guwahati. Conducted three quality improvement programmes for technical teachers sponsored by AICTE, MHRD. Member of Ergonomics subcommittee of **BIS**; PAMC member of **TIE- DST**.

Latest **honour/award**: Selected for Shri Ramendra Sundar Sinha Memorial Oration 2008, to be delivered in the XXth Annual Conference of Physiological Society of India, and Physiology and Design Ergonomics as "Dr. J.N. Mukherjee Memorial Lecture", City College, Calcutta University, January 2011

### Address for communication

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### Details of the above are enclosed in the following pages 2-13

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*Deb Kumar Chakrabarti*

17.5.2011

# 1. Chronological list of Journal Publications, Research/Technical Project Reports, Conference (paper) proceedings, Books and Films on Ergonomics

[93 publications/reports which includes Journal, Conference, Technical reports and books]

- 1979 1. Sen, R.N. and Chakrabarti, D. 1979: An ergonomic study on female workers plucking tea leaves; **Project report** No. 57, Ergonomics Laboratory, Department of physiology, Calcutta University.
- 1980 2. Sen, R.N., Ganguli, A.K., Ray, G.G., De, A. and Chakrabarti, D. 1980: A preliminary ergonomic study on tea plucking operation; **Project report** No. 71, Pp. 1-67, Ergonomics Laboratory, Department of physiology, Calcutta University.
3. Sen, R.N., Ganguli, A.K., Ray, G.G., De, A. and Chakrabarti, D. 1980: A preliminary ergonomic study on tea plucking operations; **Two and A Bud, TRA Journal**, India, 27:2, December, Pp. 74-80.
- 1981 4. Sen, R.N., Ganguli, A.K., Ray, G.G., De, A. and Chakrabarti, D. 1981: Ergonomic studies on tea plucking operation: criteria for selection and categorisation, **Applied ergonomics**, UK, June, 12:2, Pp. 81-83.
- 1982 5. Sen, R.N., Basu, S. and Chakrabarti, D. 1979-1982: Ergonomics study of different tasks performed by Indian agricultural workers for improvement of productivity; annual reports, **Project report**, UGC Project No. 053/Biol/78.
6. Sen, R.N., Ganguli, A.K., De, A. and Chakrabarti, D. 1982: An ergonomic assessment of walking speed with selected physiological parameters for work study application in man; **Proc.** of 69th session of Indian Science Congress (section Physiology), Mysore, India.
- 1983 7. Sen, R.N., Ganguli, A.K., Ray, G.G., De, A. and Chakrabarti, D. 1983: Tealeaf plucking – workloads and environmental studies; **Ergonomics**, UK, 26:9, Pp. 887-893.
8. Sen, R.N. and Chakrabarti, D. 1983: Ergonomic Implement Design, **Proc** International Ergonomic symposium, Regional Labour Institute, Calcutta, August 1983
9. Sen, R.N., Ganguli, A.K. and Chakrabarti, D. Foot anthropometry of Railway drivers, **Proc** International Ergonomic symposium, Regional Labour Institute, Calcutta, August 1983
- 1984 10. Sen, R.N. and Chakrabarti, D. 1984: A new ergonomic design of a desi plough, **Indian J. of Physiology and Allied Sciences**, 38, Pp. 97-105.
11. Sen, R.N., Ganguli, A.K. and Chakrabarti, D. 1984: Some anthropometric considerations related to Indian Railway locomotive drivers, **Indian J. of Physiology and Allied Sciences**, 38:3&4, Pp. 106-112.
12. Sen, R.N., De, A., Ganguli, A.K. and Chakrabarti, D. 1984: Anthropometry in Relation to Ergonomics of Walking for Work Study Application in Indian Agricultural Workers, **Ergonomics**, UK.
- 1985 13. Sen, R.N. and Chakrabarti, D. 1985: Ergonomic improvements in Indian agriculture, **Proc.** 72<sup>nd</sup> session of Indian Science Congress (section Physiology), Lucknow, India.
- 1986 14. Sen, R.N. and Chakrabarti, D. 1986: An ergonomic study on sickle design in Indian agriculture; **Proc.** 73<sup>rd</sup> session of Indian Science Congress (section Physiology), Delhi, India.
- 1987 15. Sen, R.N. and Chakrabarti, D. 1987: A new ergonomic float-seat for improvement of paddy cultivation in India; **Ergonomics in Developing countries; Occupational Safety and health Series**, 58, ILO, Geneva, Pp. 419-427.
16. Chakrabarti, D. 1987: Human dimensions and related anthropometric measurements for lecture theatre chair with tab. design; **Project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad- 380007, India, Pp. 1-4.
17. Ghosal, S. and Chakrabarti, D. 1987: An ergonomic study on the readymade garment at Ahmedabad for improvement of health, safety, efficiency at work and productivity; ILO research **project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad, India, Pp. 1-42, (in collaboration with SEWA, Ahmedabad).
18. Chakrabarti, D. 1987: Ergonomic evaluation of design of indigenous sickle; **Project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad, India, Pp.1-27.
19. Chakrabarti, D. 1987: A preliminary ergonomic study on India sitting functional arm-work-space envelop; **Project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad, India, Pp. 1-43.
20. Chakrabarti, D. 1987: Considerations and design for adjustable stool for drafting purpose, recommendations for BIS; **Project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad, India.

- 1988 21. Chakrabarti, D. 1988: An Ergonomic case study on two wheelers' safety and design, **Project report**, National Institute of Design, Ahmedabad, India (developed for a special workshop course material for ESCORTS).
22. Mokashi, R., Chakrabarti, D. and Kumar V. 1988: Design development of a range of toothbrush (for Colgate India Ltd.), **Project report**, National Institute of Design, Ahmedabad.
23. Chakrabarti, D. 1988; Collection of preliminary data: An ergonomic study of existing furniture, Approach paper presentation, furniture design project- school furniture, for Aluminium Association of India (AAI), **Project report**, National Institute of Design, Ahmedabad.
- 1989 24. Chakrabarti, D. 1989: Ergonomic consideration for Indian school furniture design; Proc. of 76th session of Indian Science Congress (section Physiology), Madurai, India.
25. Chakrabarti, D. 1989: **The ergonomic evaluation and design of work methods, and implements used by Indian agricultural workers, Thesis submitted** in August, 1987, for **PhD degree** of Calcutta University (guide: Professor Rabindra Nath Sen, D. Sc., Ergonomics laboratory, Dept. of physiology, Calcutta University), Pp. 1-348.
26. Sen, R.N. and Chakrabarti, D. 1989: An ergonomic study of sickle design for a reaping task in Indian agriculture, **Contemporary Ergonomics** Edited by E.D. Megaw, Taylor and Francis, Pp. 313-317.
27. Sen Rabindra Nath and Chakrabarti Debkumar, 1989: An Ergonomic Study on Sickle Design for Reaping Task in Indian Agriculture, **Journal of Human Ergology**, Article No. 739, 18:01, P 139
28. Chakrabarti, D. 1989: An ergonomic study on female bidi workers in Ahmedabad: Their working environment, work methods, design of accessories, safety, health and socio-economic status; Ergonomics laboratory, National Institute of Design, Ahmedabad, India, Pp. 1-42, ILO research **project report** (in collaboration with SEWA, Ahmedabad).
29. Chakrabarti, D. 1989: Indian anthropometric data for designers' use: a data pack on Indian body dimensions of 164 measurements on 460 subjects from different parts of India; **Project report**, Ergonomics laboratory, National Institute of Design, Ahmedabad, India, Pp. 1-49.
- 1990 30. Chakrabarti, D. 1990: 2-D specialised manikin for design use (6 different sizes manikins for a set, a set contains one each of front and side views with dimension of 5th percentile 50th percentile and 95th percentile measurements) based on generated data in "1989" (developed as a special **project**, sponsored by ESCORTS & NID).
31. Chakrabarti, D. 1990: An ergonomic study on bidi workers; Proc. of 77th session of Indian Science Congress (section Physiology), Cochin, India.
- 1992 32. Chakrabarti, D. 1992: Ergonomic study on toy safety- consumers satisfaction survey; a research **project report**, Ergonomics laboratory, National Institute of Design (in collaboration with Consumers Education and Research Centre, Ahmedabad), India, Pp. 1-44. B
- Based on this a documentary film was made by CERC with the author as subject expert.
- 1993 33. Sen, R.N. and Chakrabarti, D. 1993: Ergonomic Leg-cover for occupational health and safety of Indian agricultural workers; Occupational and Environmental Ergonomics, Indian Society of ergonomics (ISE), Calcutta, India, (Proc. International symposium on ergonomics, occupational health, safety and environment, Bombay, 1991).
34. Solanki, M.G., Patel, R.S., Jhala, P.B., Ghosal, S. and Chakrabarti, D. 1993: Ergonomic design of pedal operated loom to reduce work fatigue; Occupational and Environmental Ergonomics, Indian Society of ergonomics (ISE), Calcutta, India, Pp. 71-76, (Proc. International symposium on ergonomics, occupational health, safety and environment, Bombay, 1991).
35. Chakrabarti, D. 1993: Ergonomic considerations for equipment and product design; Proc. National workshop on ergonomics- retrospective and prospective, July 9-11, 1993, Andhra University, Pp. 29-31.
36. Chakrabarti, D. 1993: Workspace design - an ergonomic approach; Proc. National workshop on ergonomics- retrospective and prospective, July 9-11, 1993, Andhra University, Pp. 33-38.
37. Gulati, A.K., Foley, N., Seshadri, N., Sivadasani, N., Chakrabarti, D. and Mokashi, R. 1993: Psychomotor aids for the mentally handicapped- an ergonomics research project (in collaboration with the B.M institute of Mental health, Ahmedabad), **Project report**, Ergonomics laboratory, National Institute of Design.
38. Chakrabarti, D. and Katiyar, V.S. 1993: an ergonomic enquiry into the Patola Loom, **Project report**, Ergonomics Laboratory, national Institute of Design, Ahmedabad, Pp. 1-11.
- 1994 39. Chakrabarti, D. 1994: Ergonomics considerations in design of consumer products; Proc. Quality by Design, National Institute of Design, February 1994.

40. Chakrabarti, D. 1994: Anthropometry and design for Indians; Proc. symposium on Human engineering in Aviation, August 19-20, 1994, Defence Bio-engineering and Electromedical laboratory (DEBEL), Bangalore.
41. Chakrabarti, D. 1994: A study on Indian body dimensions for home interior and for furniture design- a data pack on human body dimensional requirements for interior space planning and related furniture design in the Indian context. It covers Indian body dimensions (static and dynamic) of 221 measurements on 506 subjects from 19 locations of different parts of India; A **project report** (in collaboration with the National Building Organisation, Min. of Urban development), Ergonomics laboratory, National Institute of Design, Pp. 1-52.
42. Chakrabarti, D. 1994: A preliminary ergonomic enquiry into the traditional Pit-loom of Bengal, **Project report**, Ergonomics Laboratory, National Institute of Design, Paldi, Ahmedabad, Pp. 1-22.
43. Chakrabarti, D. 1995: Anthropometry and workspace design in Indian context; Proc. National workshop on Industrial Ergonomics and Safety (NWIES-95), Feb. 17-18, 1995, Regional Engg. College Warangal, Pp.20-27.
44. Chakrabarti, D. 1996: Design of a Shear Device for plucking tea leaves, (consultancy project for Parry Agro Industries), **Project report**, National Institute of Design, Paldi, Ahmedabad, Pp. 1-8.
45. Chakrabarti, D. 1996: Anthropometry and Design for Indian needs, proc. Second International Symposium on Ergonomics, Occupational Health, Safety and Environment, November 25-28, 1996, Session-7, Design & Methods in Ergonomics, (Organised by Indian society of Ergonomics and International ergonomics Association), New Delhi, India.
46. Mokashi, R. Punekar, Sinha, A., Chakrabarti, D. and other members of the NID team 1996: Integrated Approach to Design of Public Amenities for Northern Railways- New Delhi Railway Station, (Specialist team members for specific task, Chakrabarti as Ergonomist), **Project Report**, National Institute of Design.
47. Sinha, A and Chakrabarti, D. 1997: Mapping the diverse culture of India through Cultural Symbols with special reference to Bihar, **Project report**, National Institute of Design.
- 1998 48. Chakrabarti, D. 1998: Ergonomics in the agricultural sector: Issues related to the design of agricultural implements, Proc. of the WHO workshop on Occupational Health in Agricultural Sector, (held on September 23-25, 1997, Organised by National Institute of Occupational Health, Ahmedabad), Pp.156-161.
- 2001 49. Chakrabarti, D. 2001: Backache- causes and its prevention at the workshop: from ergonomic point of view, Proc. National seminar on ergonomics and Occupational Safety, Organised by Loss Prevention of India Ltd., and Indian Society of Ergonomics, 22-23 March, 2001
50. Chakrabarti, D. 2001: Design Ergonomics: Need and Role, Special issue on Ergonomics & Human Factors engineering, ISSN 0970-3365, **Udyog Pragati, the journal for Practicing Managers**, National Institute of Industrial Engineering, Mumbai- 400087, India, April-June, 25:2, Pp. 37-43.
51. Chakrabarti, D. 2001: An integrated Approach of ergonomics Input in Bachelor of Design Education, Proc. CD\_ROM, paper No. 78, International Congress on Humanising Work and Work Environment, December 11-14, 2001, Industrial Design center, IIT Bombay, edited by Ray, GG., Ganguli, AK. and Nag, PK., Quest Publications, Mumbai, 2003, pp. 443-449.
- 2002 52. Chakrabarti, D 2002: School Furniture for IIT Guwahati school (three designs to suit all the students range from Nursery to class XII), **Project report**, Ergonomics Laboratory, Department of Design, Indian Institute of Technology, Guwahati.
- 2003 53. Chakrabarti, D. 2003: Ergonomic Space-design Evaluation Facility Centre for Quality Assurance in Learner Support System for Technical Education in Northeast India (ESDEFcentre), Sponsor MHRD, Lab facility development **Project**, Ergonomics Laboratory, IIT Guwahati.
- 2004 54. Chakrabarti, D. and Das, A. 2004: Design Development of a New Seat-desk Unit Suitable for Indian School Children, Proc. National Conference on Humanising Work and Work Environment, April 22-24, 2004, TIFAC-CORE NITIE., National Institute of Industrial Engineering, Mumbai, Pp. 131-136.
55. Das, A. and Chakrabarti, D. 2004: Role Of Free Postural Adoption On Performance and Informal Workplace Design, Proc. National Conference on Humanising Work and Work Environment, April 22-24, 2004, TIFAC-CORE NITIE., National Institute of Industrial Engineering, Mumbai, Pp. 72-76.

- 2005 56. Chakrabarti, D. 2005: Ergonomics/ Human Factors: Human aspect of Technology, ***Directions***, Indian Institute of Technology Kanpur, Vol. 7, Issue 1 March, Special Issue on Product Design and Media Communication, Pp. 41-47.
- 2006 57. Banerjee, S., Goel, K.M., Chakrabarti, D. and Das, A. 2006: An Approach to Specify Informal Sitting in Classroom, **Proceedings HWWE2005** (Humanizing Work and Work Environment, International Ergonomics Conference) December 10-12, 2005, ISBN 81-8424-124-0, Allied Publishers Pvt., Ltd., New Delhi, Pp. 144-148.
58. Chakrabarti, D. 2006: Product Ergonomics, Indo-US Design Workshop, January, IISc. Bangalore.
59. Chakrabarti, D. 2006: Role of Ergonomics in Design Development: Pleasure beyond Usability, PSI XVIII Conference, The Physiological Society of India, Kolkata, December 8-10, 2006.
- 2007 60. Chakrabarti, D. 2007: Role of Ergonomics in Making Consumer Products Usable and Pleasurable, International Conference on Frontier researches in Integrative Physiology (ICFRIP), Kolkata, 2007, January 8-10.
61. Das, A. and Chakrabarti, D. 2007: Evaluation of muscle electrical activity for carrying out different cane activities performed by cane artisans of Assam, North-East India, **Journal of Applied Physiology and Allied Sciences**, Kolkata, India (in Press).
62. Das, A. and Chakrabarti, D. 2007: Evaluation of posture and joint angles of craftsperson (Cane and Brass-metal) of Assam during performance of different activities"; **Journal of Applied Physiology and Allied Sciences**, India (in press).
63. Chakrabarti, D. 2007: Role of Ergonomics in Making Consumer Products Usable and Pleasurable, International Conference on Frontier researches in Integrative Physiology (ICFRIP), Kolkata, January 2007.
64. Chakrabarti, D. 2007: Aesthetic functionality and trust in product design: some ergonomic experiences, **Proceedings HWWE2007** (Humanizing Work and Work Environment, International Ergonomics Conference) International Ergonomics Conference, December 10-12, 2007, Central Institute of Agricultural Engineering, Bhopal, India, Pp. 470-475.
- 2008 65. Chakrabarti, D. 2008: Product Ergonomics: A User Oriented Product Development Aspect, edited by Amaresh Chakrabarti and Eswaran Subrahmanian (based on Proc. of the Indo-US Workshop on Design Engineering, held at Indian Institute of Science, Bangalore, India, January 5-7, 2006), Allied Publishers Limited, New Delhi, ISBN: 978-81-8424-312-3, Pp. 157-167.
66. Chakrabarti, D. 2008: Seat-desk: Some ergonomic Design concerns, in "Physiology for therapeutic and rehabilitation practices- Current Approaches", ISBN 978-81-7319-920-2, edited by Khanna, G.L., Narosa Publishing House, New Delhi. Pp 56-66.
67. Chakrabarti, D. 2008: "Fitting the task to the man- an ergonomical approach in regard to health in power sector", (invited speech), Proc. Workshop on Occupational safety and Health in Power Sector, 6<sup>th</sup> September 2008, Organised by Manoranjan Roy energy education Centre, Kolkata.
68. Chakrabarti, D. 2008: Design Ergonomics; an Applied Aspect of Physiology, Shri Ramendra Sundar Sinha Memorial Oration, XX Annual Conference of Physiological Society of India, held at Tripura University, 12- 4 December 2008.
69. Chakrabarti, D. 2008: Ergonomics Academic Input Leading to Design ideation, Proc. HWWE2008, International ergonomics Conference, Pune, December 22-24, 2008, ISBN 978-81-906198-2-0, Pp 557-559.
- 2009 70. Bhattacharyya, N., Baruah, S.C. and Chakrabarti, D. 2009: Ergonomic intervention to reduce Physiological Stress of Tea Pluckers, Proc. HWWE2008, International ergonomics Conference, Pune, December 22-24, 2008, ISBN 978-81-906198-2-0, Pp 485-490.
71. Chakrabarti, D. 2009: Developing safe design and some occupational ergonomics issues, in symposium on Occupational Health Management and productivity, Section of Medical Sciences including Physiology, Indian Science Congress 2009, 2-7 January, Shillong, Meghalaya, India.
72. Chakrabarti, D. and Bhattacharyya, N. 2009: Design development scope on women Occupational aspect: specific reference to different activities in tea industry, in symposium on Occupational Health Management and productivity, Section of Medical Sciences including Physiology, Indian Science Congress 2009, 3-7 January, Shillong.
73. Chakrabarti, D. 2009: Design relevant research leading to PhD: IIT Guwahati experiences, research into design: Supporting Multiple Factors of product Development, edited by Amaresh Chakrabarti (refereed paper, Proc. in international Conference on research into Design, ICoRD'09, 7-9 Jan 2009, Bangalore), research Publishing, Singapur- Chennai, ISBN 978-981-08- 2277-4, Pp. 595-599.

74. Chakrabarti, D. 2009: Role of Design Ergonomics in Machine Guarding, Proc. National Seminar on Machine Guarding and Ergonomics, (Central labour Institute, Sion, Mumbai 400022, organised by Directorate general Factory Advice Service & Labour Institutes, Min. of Labour and Employment, GOI), 23rd January, 2009.
75. Chakrabarti, D, 2009: 'Ergonomics input for Design Ideation and Functionality: IIT Guwahati Experiences', Proc. *17<sup>th</sup> World congress on Ergonomics*, Beijing, China, Paper No. 2PD0054, 9-14 August 2009.
76. Chakrabarti, D, 2009: 'Design ergonomics reference to pleasure and trustworthiness', Proc. *International Ergonomics Conference (Humanising Work and Working Environment)*, Indian Society of Ergonomics conference, Calcutta University, Kolkata, 17-19 December, 2009.
77. Bhattacharyya, N and Chakrabarti, D, 2009: 'Design development scope on women occupational aspect: Specific reference to local agro based food processing industries in NE India', Proc. *International Ergonomics Conference (Humanising Work and Working Environment)*, Indian Society of Ergonomics conference, Calcutta University, Kolkata, 17-19 December, 2009.
78. Kumar, P and Chakrabarti, D, 2009: 'User Centered design input in Mechanical Engineering and Design: Ergonomics relevance', Proc. *International Ergonomics Conference (Humanising Work and Working Environment)*, Indian Society of Ergonomics conference, Calcutta University, Kolkata, 17-19 December, 2009.
79. Ravi, T and Chakrabarti, D. 2009: 'Fashion apparel perception: Design Ergonomics relevance', Proc. *International Ergonomics Conference (Humanising Work and Working Environment)*, Indian Society of Ergonomics conference, Calcutta University, Kolkata, 17-19 December, 2009.
80. Chakrabarti, D. 2010: 'Age-related Impairments and Issues in Design Ergonomics: IIT Guwahati experiences' , Proc. *97<sup>th</sup> Indian Science Congress, section Medical Sciences and Physiology*, Thiruvananthapuram , 3- 7 January, 2010.
81. Chakrabarti, D. 2010: 'Inclusive Design: Ergonomics Perspective creating age-friendly environments', Invited lecture as a member of DST Project Advisory Committee of the Technical Innovations for Elderly , proc. *Indo-French Workshop on Information and Communication Technology for Health and Autonomy in Ageing Population*, organized by Indian Institute of Technology Jodhpur in association with French Society of Technologies for Autonomy and Geronto- Technologies and Indian Academy of Geriatrics, Jodhpur, March 17, 18 and 19, 2010
82. Ravi, T and Chakrabarti, D. 2010: 'Product acceptance-Demands convenience and Emotion rather than confining in aesthetics and technology for function', Sustainability and Technology: Now, Greenleaf Publishing Ltd. UK, Pp. 128-132; LeNS Conference Bangalore, 29 Sept.- 1<sup>st</sup> October 2010, International
83. Kumar, P and Chakrabarti, D 2011: 'Extending the life Cycle of Under-Utilized Urban Scrap Through Sustainable Design Approach', Research into Design Supporting sustainable product development, edited by Amaresh Chakrabarti, Research Publishing, Singapore, pp. 541- 550, ISBN: 978-981-08-7721-7, (outcome of ICoRD conference held IISc Bangalore, January 2011) International
84. Pandit, S., Bhattacharyya, N and Chakrabarti, D. 2011: 'An ergonomics study on women weavers' performance: Design and Occupational assessment in the handloom industries in Assam', Abstract publication, Indian Science Congress, Chennai, January, 2011
85. Chakrabarti, D. 2011: 'Good design fundamentals and ergonomics health risks factors', Abstract publication, Indian Science Congress, Chennai, January, 2011
86. Bhattacharyya, N., Pandit, S. and Chakrabarti, D. 2011: 'Work related upper limb disorders among the women workers engaged in fruit processing industries of Assam and design development scope', Abstract publication, Indian Science Congress, Chennai, January, 2011

**BOOKS : Author**

- 1997 1. **Indian Anthropometric dimensions for ergonomic design practice**; by Debkumar Chakrabarti, ISBN No: 81-86199-15-0, 161p, published in 1997 by National Institute of Design, Paldi, Ahmedabad 380007.

This publication is an outcome of 6 years intensive field work covering 23 different locations in India, conducted on 961 persons. It has two parts. Part I presents an overview of anthropometry, and methodology. Part II deals with the Indian anthropometric data pac, which contain 290 body dimensional data for males, females and male-female combined, and its

relevant applications in the field of design. This book serves as a data source on Indian anthropometrics and gives guidelines for general use of the same in the field of design. It is learnt that, as a reference book it is widely used by furniture and interior design manufacturers in India.

- 2006 2. Chakrabarti, D. and Das, A. (Edt) 2006: **HWWE2005** Humanizing Work and Work Environment (International Ergonomics Conference, December 10-12, 2005, IIT Guwahati, ISBN 81-8424-124-0, Allied Publishers Pvt., Ltd., New Delhi, 1102p.

### **Contributing Author- books**

- 1996 3. Chakrabarti, D. and Nag, P.K. 1996: *Human concept in workspace design*, Ergonomics and work design- emerging issues in organisational sciences, ISBN 81-224-0865-6, New age international (P) Ltd., New Delhi, India, Pp. 129-156.
- 1997 4. Chakrabarti, D. 1997: *Design mey ergonomics ka prayog [Hindi] (Ergonomics practice in design)*, DESIGN SAMVAD, ISBN 81-86199-96-9, Pp. 43-49, a Hindi language publication, National Institute of Design, Ahmedabad.
- 1999 5. Chakrabarti, D. 1999: Contributing author (workspace design) in Industrial and Occupational Ergonomics: User's Encyclopedia (Chief Editor Mittal. A); CD-ROM published in 1999, ***International Journal of Industrial Engineering***, ISBN 0-9654506-0-0
- 2007 6. Chakrabarti, D. 2007: *Anthropometry and Some design Issues*, (a 19-page chapter) in "Ergonomic Interventions for Health & Productivity (edited by Suman Singh)", Himanshu Publications, New Delhi.
- 2008 7. Chakrabarti, D. 2008: *Seat-desk: Some Ergonomic Design Concerns*, Physiology for Therapeutic and rehabilitation Practices- current Approaches, (edited by G L Khanna), ISBN 978-81-7319-920-2, Narosa Publishing House, New Delhi, India, Pp. 56-66.

### **FILMS**

- 1994 1. As subject expert and the follow up of a consultancy research project headed by me a documentary film was made on **toy safety- consumer's satisfaction** by CERC, Ahmedabad, 1994, (which is learnt to have telecast by the Door Darsan).
- 1995 2. '**ERGONOMICS**'- for awareness generation, targeted for common people, as sponsor producer from NID Ergonomics Laboratory and Subject expert made two short video films on Ergonomics, with the student director Dipjoy Dutta of Video Department of NID
- 1996 3. '**ANTHROPOMETRY**'- based on research on Indian human body dimensions for design, architecture, and engineering students, as sponsor producer from NID Ergonomics Laboratory and Subject expert made two short video films on Ergonomics, with the student director Dipjoy Dutta of Video Department of NID.

### **Special articles/ reports published in national Newspapers**

- 1992 'Game for Improvement', reported by V K Chakraborty, The Sunday Times of India- REVIEW, 30.8.1992.
- 1994 In 'Pit falls of market logic', reported by Amit Sengupta, The Economics Times Ahmedabad, 10.2.1994.
- 1994 In 'The interiors of exclusivity', reported by Namrata Jhoshi, The Economic Times, Ahmedabad, 21.2.1994.
- 1998 In 'Making a designer's job easy', reported by Pradeep Mallik, The Sunday Times of India, Ahmedabad, 12.7.1998.

## **2. Teaching experience**

### **1981-1986 May,**

WBBHSE, as Assistant Teacher in Human Physiology, to+2 level students.

### **1986 June – 1998 December,**

NID, as faculty of Industrial Design Courses taught at NID, the following were offered to regularly to Unger graduate programme SLPEP (School leavers professional Education Program) and Post Graduate Programme AEPEP (Advance entry Professional Education Program for graduates in various disciplines including Engineering and Architecture.

- Introduction to general Ergonomics for Foundation Course
- Design Research Methodology
- Design Process
- Design Concepts and Concerns
- Introduction to Ergonomics for Industrial Design

- Cognitive issues in Product Design, Display, and Control
- Ergonomics for Textile, Clothing and Apparel
- Ergonomics for working environment
- Ergonomics for Disables and Special Needs
- Ergonomics for bathroom-ware and table ware specific for Ceramics Design
- Ergonomics for Communication with specific inputs for Graphic design, Animation and Video
- Ergonomics for Exhibition Design
- Ergonomic inputs to senior students for diploma and Design Projects.

In addition to the above, I was a regular teacher in the CEPT, Ahmedabad, evening courses, 1988-1995 in the field of Ergonomics for Furniture Design and Interior Design.

**1998 December – till date**

### **IITGuwahati**

(Undergraduate and postgraduate levels courses developed )

- Undergraduate
  - Ergonomics: Institute Elective, for all branches of B. Tech. Final year.
  - Introduction to Ergonomics, for B. Des.
  - Behaviour science for Design
  - Communication Design Theory, for B. Des.
  - Product Ergonomics
  - Visual Ergonomics
  - Human factors component of History of Design, for B. Des.
  - System Design theory for B. Des.
  - Ergonomics input in all levels of Projects for ID and VC of B. Des
  - Applied Design Ergonomics for B Des
- Postgraduate
  - Ergonomics of Industrial Manufacturing for M Tech Mechanical Engineering
  - Applied Ergonomics for M Des
- Doctoral level courses for PhD students
  - Design dimensions- an overview (industrial design and communication design).
  - Ergonomics-1: background, criteria and principles
  - Research Methodology
  - Ergonomics-2: Research techniques
  - Form, colour & texture in design (seminar course-as guide)
  - Occupational and cognitive ergonomics,
  - Ergonomics for manufacturing.

### **3. Laboratory Experience**

- a. Setting up teaching and research laboratories
- b. Conducting Laboratory courses
- c. Using different types of instruments, systems, computers etc.

#### **At Calcutta University**

I have started my active research carrier in Department of Physiology, Calcutta University, as a postgraduate student member of a Calcutta University research team since 1979, which was followed by my Ph.D. thesis work. In Calcutta University, I was involved both in the laboratory work as well as field studies. It includes setting up of varied levels of experiments for my own Ph.D. work, other laboratory research works and relevant to design projects, demonstration to departmental students etc., as mentioned above in item No. 13 under various sub heads.

#### **At NID (my immediate past work place)**

I was a teaching faculty member since 1986. My additional responsibility was to coordinate Ergonomics activities as well as looking after the Ergonomics Laboratory. I was also Vice-Chairman of Research (DSR), and my involvement was with decision-making and to look their implementation.



To mention specifically, NID's Ergonomics laboratory was set up to cater relevant practical input to the students and for conducting design research and evaluation of varied nature. The Laboratory comprised of both the traditional and modern equipment and facilities to conduct relevant studies on:

- Sensory motor coordination (various psycho-physiological parameters measuring equipment).
- Anthropometry, workspace, work posture and biomedical (instruments, boards and rigs with special attachments).
- Biomechanical (force & torque measuring equipment).
- Computer application for ergonomics data compilation and analysis with video analysis (with recording) systems.
- Work environment measuring and evaluation (for illumination, heat, humidity, ventilation etc.) and workload and performance monitoring system
- Facilities for making experimental model and mock-up prototypes for design-user interface evaluation.

#### At IITG, my present workplace

I am in the process of setting up an Ergonomics Laboratory (as in-charge) suitable for practical acquaintance of theory inputs to Design and Engineering students of various levels as well as to conduct advance level researches, that includes facilities for Design Evaluation, and design application and studies of Human body dimensional, Physiological, socio-behavioural and work environment compatibility factors viewing to cater design and management relevant queries.

LABORATORY has following facilities to study:

**Human body dimensions aspect:** Anthropometry set to study and evaluate product and users geometric compatibility;

**Users' psycho-physical status:** Fit-kit, evaluation set;

**Environmental assessment:** Set of equipment to assess physical work environment;

**Workload & work tolerance limit:** Pulse rate monitor, O<sub>2</sub> consumption measurement for energy expenditure;

**Computerised physiological recording 'Biopac' system;**

**Audio-visual performance and signal (input) perception:** Audiometer, visual field and colour angle, etc. **Videography** based design and human movement (biomechanics) and space evaluation and analysis.

#### 4. Self PhD thesis brief

Title: **“the ergonomic evaluation and design of work methods and implements used by Indian agricultural workers”** Supervisor: Prof. Rabindra Nath Sen; Ergonomics Laboratory, Dept. of Physiology, Calcutta University, 92 APC Road, Calcutta 9.

The thesis consists of five parts containing an ergonomic study conducted both unorganised and organized sectors of Indian agriculture mainly of paddy cultivation in Eastern India and tea plantation in North-east India. The study aimed at furnishing a benchmark data and to identify the areas where low-cost improvisation could be made, to improve occupational health and safety and to increase productivity and to humanize work.

#### 5. PhD research Initiation in Design and Ergonomics, and Guidance

- Initiated PhD programme at Department of Design, IIT Guwahati (very first time in India in a department fully devoted to Design activities) and framed the structure.
- The very first of its PhD candidate of the department registered in 1999 in the area of Human vertical movement and design applications.
- There after among ongoing and enrolled students, below mentioned **three got PhD degree awarded from IIT Guwahati**

1. Utpal Barua (MFA, Presently Associate Prof., Department of Design, IITGuwahati), thesis title " A Study on Design Elements in craft Practices with Special Reference to Textile and Basketry of Northeast India", work done is in the area of Communication Design; awarded PhD degree in September 2007.
2. Amarendra Kumar Das (MDes and MBA, presently Professor and Head Department of Design, IIT Guwahati), thesis title "Design Development of an Indigenous Tricycle Rickshaw", work domain covers the area of Industrial Design and Management; awarded PhD degree in April 2008.
3. Abhijit Das (M Sc Physiology, Ergonomics specialisation), thesis title "Study on work posture and muscle load of cane and brass-metal artisans of Assam, intending to reduce occupational stress with relevant design solutions: An Ergonomics intervention", work covers aspects of Design and Occupational Ergonomics, July 2008.

**Currently guiding five students** in various aspects of Ergonomics and Design relevant areas:

1. In the area of Communication design to an in-house Assistant Professor of Dept. of Design IIT Guwahati,
2. In the area of Design and Occupational ergonomics to an Associate Professor of Assam Agricultural University.
3. In the area of sustainability and technology design for rural productivity, regular student.
4. Ergonomics of women productivity, regular student.
5. Functional aesthetics and ergonomics relevance in design, regular student.

## 6. Examiner/ referee

- Acted an external examiner for practical examination for Ergonomics and Work Physiology specialization, Dept. of Physiology, Calcutta University for five years in early 90s.
- Paper referee for the Indian Journal of Social Work (IJSW), 1992.
- Thesis examiner, Industrial Engineering, Saurashtra University, Gujarat, 1992.
- PhD thesis examiner, Dept. of Human Physiology, Vidyasagar University, West Bengal, 2001.
- Paper referee for International Congress on Humanising Work and Work Environment, December 11-14, 2001, Industrial Design center, IIT Bombay.
- Regular paper referee to Indian Journal of Physiology and allied Sciences, Calcutta.
- PhD thesis examiner for IIT Roorkee, April, '07.
- PG Ergonomics special paper practical examiner at Presidency College, Kolkata, 2006 and 2007.
- MTech thesis examiner, Ergonomics for hand-tool design, Mechanical Engineering, Aligarh University, 2008
- MDes thesis examiner for IIITDM Jabalpur, 2010.

## 7. Sponsored projects and consultancy covering around 23 different private and Govt. sectors.

### Sponsors and Projects

While at **Calcutta University**, (as student researcher)

- Ergonomic study of female tea pluckers, as a research team member, for **Assam Tea Research Association**.
- Ergonomics study of Paddy cultivation, as member of Calcutta University research team, **UGC** sponsored project.

At **National Institute of Design, Ahmedabad**

As **Project Head/ Principal Investigator**

- Ergonomic study and new design of Sickle (indigenous daow), for **State Bank of India**.
- Ergonomic study on Women Garment Workers, for SEWA (Self-employed Women's Association), Ahmedabad, an **ILO** (International Labour Organisation) Project.
- Ergonomic study on Bidi Workers, for SEWA, **ILO** Project.
- Ergonomic study on Toy Safety and Consumer Satisfaction, for **CERC** (Consumer Education and Research Centre), Ahmedabad, Sponsored from Germany.
- Design and Development of 2-D manikin set of 6 different sizes, for **ESCORTS** Ltd., Faridabad.
- Indian Anthropometric Survey, for **Harita Grammar**, Bangalore.
- Indian Anthropometric survey for Home, Interior and Furniture, for NBO (National Building Organisation), New Delhi, **Ministry of Urban Development**, Govt. of India.
- Ergonomics study and Design of Pedal Operated Loom, for **ATIRA** (Ahmedabad Textile Industry Research Association), Ahmedabad.
- Design of a Shear Device for plucking tea Leaves, for **Parry Agro Industries**.

#### As team member

- Design of a range of toothbrush, for **Colgate Pamolive Ltd.**, Bombay.
- Range of school Furniture Design using Aluminium as major material, for **AAI** (Aluminium association of India).
- Bus Stands and road dividers for **Ahmedabad Municipality**.
- Uniform Design- a range, for **IOC** (Indian Oil Corporation), Bombay.
- Design and Development of a Multipurpose Wheelchair, for **Ministry of Welfare**, Govt. of India.
- Multiple design intervention in New Delhi Rly Stn., **Ministry of Railways**.
- Apart from the above specific projects, in general my involvement was extended to most of the professional projects handled by other faculty/ team at NID needing Ergonomics input.

#### At IIT Guwahati

##### As principal Investigator

- Developing ESDEF Centre (Ergonomic Space-design Evaluation Facility Centre) in Ergonomics Laboratory, **MHRD Project**.

##### As co-investigator (involvement as ergonomics team member)

- Surface Coal Miner, as Ergonomist, for **L&T**, Raurkela.
- **KVC** (Khadi and village commission) project on various developments (product design and loom development, as ergonomics team member)/

#### Ongoing,

- Ergonomics for beginners: Industrial design perspective (Video Course), NTPPEL II, MHRD, 2009
- Virtual Ergonomics lab, under ITC mission project , MHRD. 2010 April.

### 8. Seminars, symposiums, conferences, congresses, workshops and training sessions attended/ conducted with various capacities and others in brief

- 1983 Ergonomic symposium (as a member of the organizing committee and presented a paper on Ergonomic Implement Design) Regional Labour Institute, Calcutta.
- 1986 Advance Ergonomics course, IDC, IIT Bombay, as observer faculty from NID, Ahmedabad.
- 1987 Legal workshop on Home-based piece rate workers, a 3-day workshop held at Gandhi labour Institute, Ahmedabad (presented a paper on Garment Workers).
- 1988 Conducted workshop for ESCORTS participants on two-wheeler safety and design, at NID.
  - **International Ergonomics Association Congress, Sydney, Australia.**
  - Conducted 7-day training session for SEWA (Ahmedabad) field research staff on ergonomic study methodology.
- 1990 Conducted workshop for SAMEER (Madras) participants Ergonomics Issues in electronics Product development, at NID, Ahmedabad.
- 1991 International symposium on Ergonomics, Occupational health and safety and Environment (as a member of the Organising committee and Assistant secretary of Indian Society of Ergonomics (ISE) and presented paper on ergonomics in protective equipment design), Bombay.
  - 4-day pre-symposium workshop (as a faculty member) on 'Application of ergonomics in Low-cost Improvements, ISE, held at IDC, IIT Bombay.
  - Invited lecture on Ergonomics and Design in Home management, Home Management Workshop, Dept. of Home Science, Baroda University.
- 1992 Invited lecture cum demonstration on Nutrition and Ergonomics, Women's college, Agartala, Tripura.
  - Invited lecture cum demonstration on experience and Activities in the Field of ergonomics and designing, dept. of Life Sciences, Tripura University.
- 1993 National Workshop on Ergonomics, Andhra University.
- 1994 Symposium on Human engineering in Aviation, Defence Bio-engineering and Electromedical Laboratory (DEBEL), Bangalore.
- 1995 National workshop on Industrial Ergonomics and Safety (NWIES-95), Regional Engg. College, Warangal.
- 1996 Paper, 2nd International Symposium on Ergonomics, Occupational Health and Safety, held in November 1996 at SCOP complex, Delhi.
- 1997 Invited speaker, WHO workshop on Occupational Health in Agricultural Sector, Organised by National Institute of Occupational Health, Ahmedabad.
- 2000 Methodology in Ergonomics- workshop organized by IDC, IIT Bombay, June 2000.
- 2001 Invited Speaker, National seminar on ergonomics and Occupational Safety, Organised by Loss

- Prevention of India Ltd., and Indian Society of Ergonomics.
- Paper, Session Chair, International Congress on Humanising Work and Work Environment, (convener referee of design section), IIT Bombay, December.
- 2004 Conducted a three-day (14 to 16th January 2004) workshop on Ergonomics, at Industrial Design Programme, IIT Kanpur.
- National Conference on Humanising Work and Work Environment, April 22-24, 2004, TIFAC-CORE NITIE., National Institute of Industrial Engineering, Mumbai.
  - Conducted 5-day 'Ergonomics in Engineering Applications', STC, AICTE sponsored, IITG, October.
- 2005 Conducted 5-day workshop on design ergonomics, for M Des students, at Industrial Design Programme, IIT Kanpur.
- Paper, Indian Folklore Congress, Guwahati University.
  - Organised one-day workshop on 'Ergonomics Methodology', at IITG, 9.12.2005.
  - Organised a two-day IEA sponsored workshop on 'Agriculture ergonomics Check list', 13-14. December 2005.
  - **Organising secretary for HWWE2005 (International ergonomics Conference, December 2005) at IIT Guwahati.**
- 2006 Paper, Indo-US Design Workshop, January, IISc. Bangalore.
- Conducted 5-day workshop on design ergonomics, for M Des students, at Industrial Design Programme, IIT Kanpur.
  - Conducted 5-day 'Human Interface in Design and Engineering', STC, AICTE sponsored, IITG, March.
  - Conducted, two-day Ergonomics workshop for 2-batches of executives at BRPL, Bongaigaon, Assam.
  - Invited Lecture, Dental Ergonomics, at Mahatma Gandhi Govt. Dental College, Pondichery.
  - Invited lecture, Indo-USA design Workshop, IISc. Bangalore, January, 2006.
- 2007 Two one-day workshops for executives of IOL at Dhuliajan, Assam, March '07.
- One week ergonomics workshop for 4<sup>th</sup> year design students of Symbiosis, Pune, June '07.
  - Lecture on Design Ergonomics for Architect students of IIT Roorkee, April '07.
  - Four special sessions in QIP at IIT Roorkee, July '07.
- 2007-8 Internship training which include students of IIT Kharagpur (May ,07); National Institute of Technology Trichi (December '07); and Delhi School of planning and Architecture at DoD, IIT Guwahati (June- July '08).
- 2008 - Invited speech, "Fitting the task to the man- an ergonomical approach in regard to health in power sector", in Workshop on Occupational safety and Health in Power Sector, 6<sup>th</sup> September
- Organised by Manoranjan Roy energy education Centre, Kolkata.
  - One week workshop on Design Ergonomics to Masters students at IIITDM, Jabalpur, September.
  - Chair to session Health/ Occupational Health, HWWE2008, International ergonomics Conference, Pune, December 22-24, 2008
  - Ideation/ Innovation and some issues of Ergonomics and Human Factors in Product Development, lecture to QIP Short-term course on Product Innovation, Design Dept, IITG, July, 7-11<sup>th</sup>, 2008.
  - Education Methodology: Skill, lecture to QIP Short-term course Aerospace Propulsion for Beginners, Mechanical Engineering Dept, IITG, 8-12, December 2008.
- 2009 Triennial **Ergonomics World Congress**, International Ergonomics Association, **Beijing, China**, August.
- International Ergonomics Conference (Humanising Work and Working Environment), Indian Society of Ergonomics conference, Calcutta University, December, 2009, Paper and Chaired a session.
- 2010 97<sup>th</sup> Indian Science Congress (Invited lecture), Thiruvananthapuram, January.
- Indo-French Workshop on Information and Communication Technology for Health and Autonomy in Ageing Population (Invited topic presentation, to TIE DST session), Organised by IIT Jodhpur and DST, Jodhpur, March.
  - Four lectures under topic Design Ergonomics, Design programme, IIT Kanpur, September.
  - Basics of design ergonomics, Dept. of architecture, IIT Roorkee, October.
  - Design ideation for elderly needs, under TIE Programme, DST, October.

2011 Indian Science Congress, Chennai, January  
- Physiology and Design Ergonomics as “Dr. J.N. Mukherjee Memorial Lecture”, City College, Calcutta University, January.

In addition- Journal referee and editorial board member to Journal of Applied physiology and Allied Sciences.

Invited lectures in QIP STC programmes held at IITG by other departments from time to time, and invited lectures to various institutions as regular outreach activities.

## 9. Administrative, membership and other relevant experiences

### At NID

1998- 1993 Hostel administration and Mess advisor.  
1993-1998 Coordinator ergonomics and Vice Chairman Design Services & Research with independent charge of Research.

### At IITG

- 1999-2003 Hostel Warden  
2000-2002 Convenor Institute time table committee.  
2003- Feb. 2006 Chairman Institute Hostel Management Committee.
- External member for Departmental Under Graduate Programme Committee of Mechanical Engineering Dept., IIT Guwahati for two terms of each 3 years; continuing.
  - Life Member of Indian Science Congress
  - Since 1986, One of the founder life member of Indian Society of Ergonomics (ISE), Calcutta, affiliated to the International Ergonomics Association (IEA).
  - From 1988 to 1996, Assistant General Secretary, Indian Society of Ergonomics (ISE), Calcutta.
  - Journal referee and editorial board member to Journal of Applied physiology and Allied Sciences.
  - Member of many professional bodies including Design and Ergonomics subcommittees of Bureau of Indian Standards (BIS) and advisory committees for national and international conferences, etc., with various capacity from time to time till date.
  - Life member (LM 29750) of Indian Society for Technical Education, Shamed Jet Singh Margi, New Delhi- 110 016.
  - Life member of Physiological society of India, Kolkata
  - Life member Biomedical Society of India
  - Organised (organizing secretary) HWWE2005 (International ergonomics Conference, December 2005) a total 6-day event at IIT Guwahati.
  - Organised three QIP Short Term Courses on Ergonomics for engineering faculty, sponsored by AICTE, MHRD at IIT Guwahati.
  - Member of faculty selection committee, Calcutta University, Physiology and Home Sciences, for Assistant, Associate and professor positions.
  - PAMC member of TIE- DST.



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