

# Curriculum Vitae

## Surajit Borkotokey

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Department of Mathematics  
9954430677

Ph. 091-

Dibrugarh University  
sborkotokey@dibru.ac.in Dibrugarh, Assam-786004

Email:

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**FIELDS OF INTEREST:** Cooperative Game Theory, Networks, Fuzzy Sets, Aggregation.

**EDUCATION:**           **Ph.D., Mathematics,** Dibrugarh University  
                                  **M. Phil., Mathematics,** Delhi University  
                                  **M.Sc., Mathematics,** Delhi University

### PROFESSIONAL EXPERIENCE:

**Professor and Head,** Department of Mathematics, Dibrugarh University  
**Chairperson,** Centre for Computer Science and Applications, Dibrugarh University  
**Associate Professor,** Department of Mathematics, Dibrugarh University, 2008-2014  
**Assistant Professor,** Department of Mathematics, Dibrugarh University, 1999-2008  
**Indo-US Fellow** at Louisiana State University, USA (2011-12)  
**Visiting Faculty** at Beijing Institute of Technology, China (2014, 2016)  
**Visiting Faculty** at Slovak University of Technology, Bratislava, Slovakia (2017)

### EDITORIAL ACTIVITY:

Guest Editor, Special Issue of Studies in Microeconomics, SAGE (2015). Chief Editor, Mathematical Forum (2010-2012).  
Member, Editorial Board, Journal of Assam Academy of Mathematics, India. Editorial Board Member, Mathematical Forum (2010-2012).  
Editor, Proceedings of National Seminar on Mathematical Modelling, held in the Department of Mathematics, Dibrugarh University, during March 3-5, 2008 under UGC- SAP.

### JOURNAL PAPERS:

Surajit Borkotokey, Pankaj Hazarika & Radko Mesiar (2019) Cooperative games with multiple attributes, *International Journal of General Systems*, DOI: [10.1080/03081079.2019.1659792](https://doi.org/10.1080/03081079.2019.1659792)

Kakati, P., Borkotokey, S., Rahman, S. et al. (2019) *Interval neutrosophic hesitant fuzzy Einstein Choquet integral operator for multicriteria decision making*, Artificial Intelligence Review. <https://doi.org/10.1007/s10462-019-09730-7> (Springer)

Chunsheng Cui, Zhongwei Feng, Chunqiao Tan, **Surajit Borkotokey**. *Loss Aversion Equilibrium of Bimatrix Games with Symmetric Triangular Fuzzy Payoffs*, Int. J. Fuzzy Syst.

(2019). Springer, <https://doi.org/10.1007/s40815-019-00611-3>.

Zhen Wang, Lesheng Jin, Ronald R. Yager, Surajit Borkotokey, 2018, *Ordered Weighted Sum in infinite sequences environment with applications*, November 2018, Journal of Intelligent and Fuzzy Systems DOI: 10.3233/JIFS-181291

Le Sheng Jin, Radko Mesiar, Martin Kalina, Jana Špirková and Surajit Borkotokey, *Generalized phi-transformations of aggregation functions*, Fuzzy Sets and Systems, Elsevier, Available online on 2nd October, DOI: <https://doi.org/10.1016/j.fss.2018.09.016>

M. Tiken Singh, Surajit Borkotokey, 2019, Selfish Controlled Scheme in Opportunistic Mobile Communication Network, In *Recent Developments in Machine Learning and Data Analytics*, Editors: Kalita, J., Balas, V.E., Borah, S., Pradhan, R. (Eds.), Springer Singapore. DOI:10.1007/978-981-13-1280-9

Loyimee Gogoi, Surajit Borkotokey, Diganta Mukherjee, 2019, *Multilateral Interactions and Isolation in Middlemen driven Network Games*, In *Social Network Analytics*, 1st Edition, Computational Research Methods and Techniques, Eds. Nilanjan Dey, Samarjeet Borah, Rosalina Babo, Amira Ashour, Paperback ISBN: 9780128154588, Academic Press, Elsevier.

Pankaj Kakati, Surajit Borkotokey, Radko Mesiar, Saifur Rahman (2018) *Interval Neutrosophic Hesitant Fuzzy Choquet Integral in Multicriteria Decision Making*, **Journal of Intelligent and Fuzzy Systems**, IOS Press. (In Print)

Surajit Borkotokey, Loyimee Gogoi, Diganta Mukherjee (2018) *Bi-cooperative network games: A link based allocation rule*, **International Journal of Economic Theory** 14 (2), 103-128, Wiley Blackwell.

LeSheng Jin, Radko Mesiar, Surajit Borkotokey, Martin Kalina, (2018) *Certainty Aggregation and the Certainty Fuzzy Measures*, **International Journal of Intelligent Systems**. DOI: 10.1002/int.21961.

LeSheng Jin, Radko Mesiar, Martin Kalina, Surajit Borkotokey, (2018) *Discrete Choquet integrals for Riemann integrable inputs with some applications*, **IEEE Transactions on Fuzzy Systems**, DOI: 10.1109/TFUZZ.2018.2792458.

Surajit Borkotokey, Radko Mesiar, Jun Li, Fateme Kouchakinejade, Alexandra Siposova (2017) *Event-based transformations of capacities and invariantness*, **Soft Computing**, Springer. DOI: 10.1007/s00500-017-2970-3.

Pankaj Hazarika, Surajit Borkotokey, Radko Mesiar (2017), *Bi-cooperative games in Bipolar Fuzzy Settings*, **International Journal of General Systems**, Taylor and Francis. DOI: 10.1080/03081079.2017.1388800.

Radko Mesiar, Surajit Borkotokey, LeSheng Jin, Martin Kalina (2017) *Aggregation under uncertainty*, **IEEE- Transactions of Fuzzy Systems**, DOI: [10.1109/TFUZZ.2017.2756828](https://doi.org/10.1109/TFUZZ.2017.2756828)

Zhengxing Zou, Qiang Zhang, Surajit Borkotokey, X. Yu (2017) *The extended Shapley value for generalized cooperative games under precedence constraints*, **Journal of Operational Research**, Springer, 1-27, DOI:10.1007/s12351-017-0341-6.

Radko Mesiar, Surajit Borkotokey, LeSheng Jin, Martin Kalina, (2017) *Aggregation functions and capacities*, **Fuzzy Sets and Systems**, Elsevier, DOI: <https://doi.org/10.1016/j.fss.2017.08.007>.

Surajit Borkotokey, Rajnish Kumar, Sudipta Sarangi, (2015), *A solution concept for*

*network games: The role of multilateral interactions*, **European Journal of Operational Research**, 243, 3, 912-920, Elsevier.

Rajib Biswakarma, Surajit Borkotokey, Radko Mesiar (2017) *A simplified expression of Share Functions for Cooperative Games with Fuzzy Coalitions*, **Journal of Tatra Mountains Mathematics Publications** 69, 1-6.

Surajit Borkotokey, Pankaj Hazarika, Radko Mesiar (2015) *Fuzzy Bi-cooperative Games in Multilinear Extension Form*, **Fuzzy Sets and Systems**, 259, 44-55, Elsevier.

Surajit Borkotokey, Pankaj Hazarika, Radko Mesiar (2015) *A Multilinear Extension of a Class of Fuzzy Bi-cooperative Games*, **Journal of Intelligent and Fuzzy Systems**, 28, 2, IOS Press.

Surajit Borkotokey, Rupok Neog (2014) *Dynamic Resource Allocation in Fuzzy Coalitions : A Game Theoretic Model*, **Fuzzy Optimization and Decision Making**, 13, 2, 211-230, Springer.

Surajit Borkotokey, Rupok Neog, (2013) *Role of satisfaction in resource accumulation and profit allocation: A fuzzy game theoretic model*, **Fuzzy Systems (FUZZ), 2013 IEEE International Conference on** vol.1, no.8, pp. 7-10 July 2013, doi: 10.1109/FUZZ-IEEE.2013.6622379.

<http://ieeexplore.ieee.org/stamp/stamp.jsptp=&arnumber=6622379&isnumber=6622297>

Surajit Borkotokey, Pranjal Sarmah (2012) *Bi-cooperative games with fuzzy bi-coalitions*, **Fuzzy Sets and Systems**. 198 (1) 46-58, Elsevier.

Surajit Borkotokey, Rupok Neog, (2012) *Allocating profit among rational players in a fuzzy coalition : A game theoretic model*, **Group Decision and Negotiation**, Springer, 21 (4) 439-459.

Surajit Borkotokey (2008) *Cooperative Games with Fuzzy Coalitions and Fuzzy Characteristic Functions*, **Fuzzy Sets and Systems**, 159 (2) 138– 151, Elsevier .

Surajit Borkotokey (2009) *Fuzzy Subspace of a Vector Space: A Topological Approach*, **Int. J. of Fuzzy Mathematics**, 2 (17) 403-414.

Surajit Borkotokey (2007) *On Tensor Product of Fuzzy Submodules*, **Int. J. of Fuzzy Mathematics**, 15 (2) 581-592.

Surajit Borkotokey (2006) *RGamma-submodules in Fuzzy Setting*, **Int. Review on Fuzzy Mathematics**, 1 (1) 33-46.

Surajit Borkotokey, Baldev Banerjee (2003) *Gamma-Semigroup in Fuzzy Setting*, **Int. J. of Fuzzy Mathematics**, 11(4) 995-1003.

#### REFEREED SURVEY PAPERS:

Surajit Borkotokey, Loyimee Gogoi, Sudipta Sarangi (2014) *A Survey of Player-based and Link-based Allocation Rules for Network Games*, **Studies in Microeconomics**, SAGE, 2,1, 5-26.

Surajit Borkotokey, Radko Mesiar (2013) *The Shapley value of Cooperative Games under Fuzzy Settings : A Survey*, **International Journal of General Systems**, 43 (1) 75-95, Taylor and Francis.

#### REFEREED BOOK CHAPTERS:

M. Tiken Singh, Surajit Borkotokey, 2019, *Selfish Controlled Scheme in Opportunistic Mobile Communication Network*, In **Recent Developments in Machine Learning and Data Analytics**, Editors: Kalita, J., Balas, V.E., Borah, S., Pradhan, R. (Eds.), Springer Singapore. DOI10.1007/978-981-13-1280-9.

Loyimee Gogoi, Surajit Borkotokey, Diganta Mukherjee, 2019, *Multilateral Interactions and Isolation in Middlemen driven Network Games*, In. **Social Network Analytics**, 1<sup>st</sup> Edition, Computational Research Methods and Techniques, Eds. Nilanjan Dey, Samarjeet Borah, Rosalina Babo, Amira Ashour, Paperback ISBN: 9780128154588, Academic Press, Elsevier.

Surajit Borkotokey, Komorníková, Jun Li, Radko Mesiar (2018) *Aggregation Functions, Similarity and Fuzzy Measures*. In: Torra V., Mesiar R., Baets B. (eds) **Aggregation Functions in Theory and in Practice**. AGOP 2017. Advances in Intelligent Systems and Computing, vol 581. Springer, Cham.

Surajit Borkotokey, Radko Mesiar, Jun Li (2017) *Event-based transformations of capacities*, Book Chapter, September 2017 DOI: 10.1007/978-3-319-67422-3\_4. In book: **Modeling Decisions for Artificial Intelligence**, pp.33-39, Springer.

Surajit Borkotokey, Rajnish Kumar, Sudipta Sarangi (2014) *Bi-cooperative Games : Applications in Management and a Simple Solution*, Book Chapter, **Applications of Game Theory**, Ed. R. K. Mishra, Shaheen, J. Raveendran, S. Deman, 51-65, Academic Foundation Pub.

Surajit Borkotokey (2011) A Dynamic Solution concept to cooperative games with fuzzy coalitions, Book Article, *Topics in Non-convex Optimization*, Chapter 13, pp 215-229, Springer Ed. S.K. Mishra. Borkotokey, S. (2013) *Recent Advances in Game Theory and its Applications to Net-works*, (Book Article) Chapter 7, **Mathematical Sciences and their Applications: Recent Advances, Editor(s):** Karabi Dutta Choudhury, Devajyoti Biswas, Sumit Saha, Narosa.

### **BOOK PUBLISHED:**

Advanced Topics in Fuzzy Algebra : Recent Developments, Verlag Dr. Muller Publications, Germany, (2010) ISBN: 978-3-639-26400-5.

### **WORKING PAPERS:**

Surajit Borkotokey, Loyimee Gogoi, Rajnish Kumar, From the Shapley value to Equal Division.

Dhrubajit Choudhury, Surajit Borkotokey, Loyimee Gogoi, Rajnish Kumar, The  $k$ -lateral value for TU games.

Dhrubajit Choudhury, Surajit Borkotokey, A new value between the Shapley and the Equal Division.

Loyimee Gogoi, Subhadip Chakravarty, Surajit Borkotokey, Rajnish Kumar, Rob Gilles, Probabilistic Network Games.

### **AWARDS, GRANTS, DISTINCTION AND FELLOWSHIPS**

UKIERI Award for a Project on Bi-cooperative Network Games and its Applications to Networks for three years between Dr. Rajnish Kumar, Queen's University, Belfast and Prof. S. Borkotokey, Dibrugarh University. Total amount of 1,62,000 GBP.

NSP (National Scholarship Program) award from SAIA, Slovak Government for three months to work as a visiting faculty at Slovak University of Technology during January-March, 2017.

UGC Major Research Project (2013-2016) on Cooperative Games and its Applications to Networks in crisp and fuzzy environments. Total Amount: Rs. 10.52 Lacs.

Indo-US Research Fellowship for doing research in Network Analysis at the Dept. of Economics, Louisiana State University, USA during 2011 awarded by the Indo-US Science and Technology Forum, India. Total Fellowship Amount: \$ 27000.

UGC sponsored Minor Research Project (2008-10) on “Cooperative Games with fuzzy coalitions and vague expectations”.

National award for Best Research Paper in Mathematical Science Section Presented in the Mathematical Science Section of “ Indian Science Congress - 2002” held in Lucknow, India.

## **POST DOCTORAL ACTIVITIES:**

Department of Economics, Louisiana State University, Baton Rouge, LA, USA under the Indo-US Science and Technology Research Fellowship for 9 months during September, 2011 – May, 2012 on the project “Mathematical Modelling of Networks” .

## **REVIEW ACTIVITIES:**

European Journal of Operation Research, International Journal of Game Theory, Information Sciences, Fuzzy Sets and Systems, Information Sciences, Kybernetika, Journal of Intelligent and Fuzzy Systems, Mathematical Methods of Operations Research, Iranian Journal of Fuzzy Mathematics, Review of Economic Design.

## **WORKSHOPS AND CONFERENCES:**

### **Organized:**

International Workshop on Game Theory and Networks, 13-15 September 2018 under the aegis of UK-India Education and Research Initiatives (UKIERI), jointly funded by the British Council and University Grants Commission.

International Conference on '*Network and Games*', from 27<sup>th</sup> – 29<sup>th</sup> April at Queen's Management School, as the part of UK India Education and Research Initiative (UKIERI), jointly funded by the British Council and University Grants Commission.

International Seminar on Game Theory and Its Applications to Social and Economic Networks, 10-12 December 2014, under the aegis of NBHM and Dibrugarh University.

Joint Coordinator, A Five day workshop on Statistical Data Analysis organized by the Department of Mathematics and Statistics funded by ISI, Kolkata during 26-30 November 2013.

Member, Core Committee, Game-Net Workshops in ISI-Kolkata 2013,2016,2017, IGIDR-Mumbai 2015, IIT-Ropar 2014.

### **Presented Paper:**

“Bi-cooperative Network Games: A Solution Concept”

International Conference on International Conference on '*Network and Games*', 27<sup>th</sup> – 29<sup>th</sup> April 2018, Queen's Management School, UK.

“Identifying Biological markers: A Bi-cooperative Game Theoretic Approach”

International Conference on Networks and Games, 03-04 July 2017, ISI-Kolkata.

“Middlemen in TU Games”

International Conference on Multilateral Economic Cooperation Strategy under One Belt One Road framework and Research Development in Game Theory, June 17-19, 2016, Xi'an, China.

“Role of Middleman in TU games”

International Symposium on Fundamentals of Games and Decision Making, IGIDR- Mumbai, 12-14 March 2016.

“Intermediary Values”

International Conference of Analysis and Applications, BHU, India, 6-8 February 2016.

“Middleman in Cooperative Games”

National Conference on Networks and Games, IIT Ropar, India, 7-9 December 2015.

“A New Solution to Cooperative Games : The Role of a Parasite Player”

International Conference of Recent Advances in Frontiers of Mathematics, 27-29 March 2015, Gauhati University.

“An Axiomatic Characterization of a Fixed and Flexible Network Allocation Rule”

IWGTS 2014, 24-31 July 2014, Sao Paulo, Brazil.

“Multilinear extension of Fuzzy Bi-cooperative Games”

International Seminar on Game Theory, Beijing Institute of Technology, 4-5 July 2014.

“Bi-cooperative Network Games”

International Seminar on Game Theory, Beijing Institute of Technology, 4-5 July 2014.

“An Interactive Allocation Rule for Networks”

International Seminar on Social and Economic Networks’ 25/10/2013 to 27/10/2013, IIT, Jodhpur.

“An Allocation Rule for Networks”

13th SAET Conference, Mines Paris Tech, Paris, France, 22- 26 July 2013.

“Role of Satisfaction in Resource Accumulations and Payoff Allocation : A Fuzzy Game Theoretic Model”

Fuzz-IEEE 2013, International Conference on Fuzzy Systems, Hyderabad, 07-10 July 2013.

“A Survey on the Shapley value for Cooperative Games under Fuzzy Environment”

NCPAM 2013, Royal College of Engineering, Guwahati, India held during 09/05/2013-10/05/2013.

“A New Allocation Rule for Networks”

Research meet on Strategic Network Formation & Evolution in ISI- Kolkata, during March 7 & 8, 2013. <http://www.isical.ac.in/~biru/>.

“Potential in Bi-cooperative Games: A Note”

The International Conference on Game Theory and Management in Applications, organized jointly by Indian Institute of Public Entrepreneurship, Hyderabad, ISI, Madras and The Center

for Economics and Finance, London, UK held during 17-18 December, 2012 at Green Park Hotel, Hyderabad. <http://www.gametheorysociety.org/conferences/2012.html>

“Network Allocation Rules”

11th Meeting of Society for Social Choice and Welfare, 17-20 August 2012, New Delhi, India.  
<http://www.isid.ac.in/~sscw2012/Program.html>

“An allocation rule for Network Games”

Midwest Economics Association Conference (International), 18-20 May 2012, Bloomington, Indiana University, USA.

<http://editorialexpress.com/conference/MWETSpring2012/program/MWETSpring2012.html#10>

## **SERVICES:**

Chairperson, Department Research Committee in Mathematics, Dibrugarh University.

Chairperson, Department Research Committee in Computer Science, Dibrugarh University.

Teacher Member, Dibrugarh University Sports Board

Faculty Member, Electronic and Media Research Centre, Dibrugarh University

Chairperson, Board of Studies in Mathematics, Dibrugarh University.

Chairperson, Board of Studies in Computer Science, Dibrugarh University.

Member, Board of Studies in Management Studies, Dibrugarh University.

Chairperson, Departmental Management Committee, 2005, 2012.

Member, Academic Council, Dibrugarh University (2014-)

Member, Academic Council, Lakhimpur Autonomous College (2018-2020)

## **TEACHING:**

### **COURSES TAUGHT:**

**Post Graduate :** Real Analysis, Measure Theory, Abstract Algebra, Operations Research, Operator Theory, Fuzzy Sets and Applications, Commutative Algebra.

**M.Phil. / Ph.D. Course work:** Cooperative Game Theory, Fundamentals of game Theory, Research Methodology in Mathematics.

**MBA Program :** Quantitative Techniques.

### **THESIS/DISSERTATION COMMITTEES:**

Rupok Neog (Chair 2012), Pankaj Hazarika(Chair 2014), Loyimee Gogoi (Chair 2016), Pankaj Kakati (Chair 2015), Rajib Biswakarma(Chair 2018), Utpala Borgohain(Chair 2015), Paporri Neog Borah(Chair 2018), Nomi Baruah(Chair 2017), Tiken M Singh(Chair 2017), Dhruvajit Choudhury(Chair 2016), Parishmita Baruah(2018), Ritu Dutta(2017), Sujata Gowala(2017).



EXTERNAL EXAMINER FOR DOCTORAL DISSERTATIONS:

Devanjan Hazarika (2016), Thanuja T S.(2018), Anusha Edwin (2018)

**REFERENCES:**

**PROF. TES RAGHAVAN**

Professor Emeritus  
Department of Mathematics and Statistics  
University of Illinois, Chicago  
USA  
Email: [terctu@gmail.com](mailto:terctu@gmail.com)

**PROF. RADKO MESIAR**

Professor and Head  
Department of Descriptive Geometry  
and Mathematics, Faculty of Civil Engineering,  
Slovak University of Technology, Bratislava,  
Slovakia  
Email: [mesiar@math.sk](mailto:mesiar@math.sk)