Curriculum Vitae
of
Dr. Pritpal Singh, PhD (CSE), PDF

Assistant Professor, Department of Data Science and Analytics
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And

Adjunct (Research) Professor [The Jagiellonian University, Poland]
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> I believe that discussion and sharing knowledge brings one closer to his/her next milestone. Such an act promotes collaboration and mutual respect to build a very confluent environment, both in academics and research. So, I will always try to create such an environment among my fellow colleagues and students.

"Everything that comes to us that belongs to us if we create the capacity to receive it." —**Rabindernath Tagore** *(Nobel Prize in Literature)*

<u>Contents</u>

1 ABOUT MYSELF

Pritpal Singh received the Ph.D. degree in computer science and engineering from Tezpur (Central) University, Tezpur, India, in February 2015. He received Master Degree in Computer Applications from Dibrugarh University, Assam (India), in 2008. From July 2009 to June 2013, He was a Senior Research Fellow at the Department of Computer Science and Engineering, Tezpur (Central) University. In July 2013, He was appointed as a Lecturer at the School of Mathematics and Computer Applications, Thapar University, Punjab (India). From November 2015 to February 2019, He worked as an Assistant Professor at the Faculty of Computer Applications (FCA), CHARUSAT Campus, Anand, Gujarat (India).

He has been appointed as a Faculty with the School of Mathematics and Computer Applications, Thapar University, Patiala, India, in July 2013. He worked as a Postdoctoral Research Fellow with the Department of Electrical Engineering, National Taipei University of Technology, New Taipei, Taiwan, and the Adjunct Professor (Research) with the Institute of Theoretical Physics, Jagiellonian University, Poland. He is currently an Assistant Professor with the Department of Data Science and Analytics, Central University of Rajasthan, Ajmer, India.

He has published numerous papers in refereed SCI journals, conference proceedings, book chapters, and books. His research articles can be found in IEEE Transactions on Systems, Man and Cybernetics: Systems, Information Sciences (Elsevier), Artificial Intelligence in Medicine (Elsevier), Computer Methods and Programs in Biomedicine (Elsevier), Knowledge-Based Systems (Elsevier), International Journal of Approximate Reasoning (Elsevier), Engineering Applications of Artificial Intelligence (Elsevier), Applied Soft Computing (Elsevier), Journal of Computational Science (Elsevier), Computers in Industry (Elsevier), Expert Systems With Applications (Elsevier), among others.

His research interests include ambiguous set theory, optimization algorithms (especially quantum-based optimization), time series forecasting, image analysis, fMRI data analysis, machine learning, and mathematical modeling and simulation.

Dr. Singh has been awarded a Postdoctoral Research Fellowship from the Ministry of Science and Technology, Taiwan, in March 2019. He also received the prestigious International Visiting Research Fellowship from the Foundation for Polish Science, Poland, in 2020.

2 PROFESSIONAL POSITIONS

⋆ Assistant Professor (June 08, 2022–Present): Department of Data Science and Analytics, Central University of Rajasthan, Ajmer-305817, Rajasthan, India

⋆ Assistant Professor (Nov. 28, 2015–Feb. 23, 2019): Department of Computer Application, Charotar University of Science and Technology (CHARUSAT), Anand-388421, Gujarat, India

⋆ Lecturer (Jun. 27, 2013–Nov. 23, 2015): Department of Computer Science and Engineering, Thapar University, Patiala-147004, Punjab, India

3 RESEARCH EXPERIENCES

⋆ Adjunct Professor (Research) (Nov. 16, 2020–March 31,2022): Institute of Theoretical Physics, Jagiellonian University, ul.Łojasiewicza 11, Kraków 30-348, Poland

⋆ Postdoctoral Research Fellow (Mar. 01, 2019–Feb. 29, 2020): Department of Electrical Engineering, National Taipei University of Technology, Taipei, Taiwan 10608

4 EDUCATION

⋆ Ph.D. $(2009 - 2015)$: Computer Science and Engineering, Department of Computer Science & Engineering, Tezpur (Central) University, Assam, India

⋆ Post Graduation $(2005 - 2008)$: Master in Computer Applications (MCA), Dibrugarh University, Assam, India

⋆ Graduation $(2002 - 2005)$: B.Sc. with Physics, Chemistry & Mathematics, Dibrugarh University, Assam, India

⋆ Pre-Degree $(2000 - 2002)$: Higher Secondary in Science, Assam Higher Secondary Education Council, Assam, India

⋆ HSLC (1999): High School Leaving Certificate, Secondary Education Board of Assam, Assam (India)

5 ABOUT Ph.D. DISSERTATION

⋆ Title: Applications of Soft Computing in Time Series Forecasting

⋆ Abstract: In this thesis, we provide in-depth study of various issues and problems associated with the fuzzy time series (FTS) modeling approaches in time series forecasting. Empirical studies suggest that hybridization of the SC techniques can improve the forecasting accuracy as compared to utilization of original techniques. Apart from exhaustive literature survey on applications of FTS in time series forecasting, we provide improved methods for forecasting based on the FTS, and its hybridization with neural networks and particle swarm optimization. Our main contributions are: (a) A new FTS based forecasting model is proposed that can deal with one-factor time series dataset very effectively. This model deals with four major issues viz., determination of effective length of intervals, handling of fuzzy logical relationships (FLRs), determination of weight/importance for each FLR, and defuzzification operation., (b) A high-order model based on hybridization of artificial neural network (ANN) with the FTS is proposed. This model resolves two domain specific problems, viz., determination of effective length of intervals and defuzzification operation., (c) A Two factors high-order model is developed based on hybridization of ANN with the FTS. Detailed architecture of the model is provided in the thesis to show how this model employs high-order FLRs to obtain the forecasting results. (d) A new M-factors time series model based on particle swarm optimization and Type-2 FTS model is presented to improve the efficiency of the FTS modeling approach., and (e) Another application of SC technique is demonstrated by designing a model based on ANN to predict summer monsoon rainfall of India using the observed time series datasets of four summer monsoon months, viz., June, July, August and September.

⋆ Advisor: Dr. Bhogeswar Borah, Professor, Department of Computer Science and Engineering, Tezpur (central) University, Assam (India)

⋆ Registration No.: 018 of 2013

⋆ Date of Enrollment: Jul. 27, 2009

⋆ Degree Awarded: Feb. 16, 2015

6 RESEARCH STATEMENT

6.1 RESEARCH INTERESTS

⋆ Image Processing, Segmentation and Edge Detection: Uncertainty representation and change detection in biomedical images.

⋆ Machine Learning: SVM, HMM, Naive Bayes Classification, PCA.

⋆ Optimization Algorithm: Bio-inspired and Quantum Based.

⋆ Soft Computing: Fuzzy set, Neutrosophic set, Rough set, Artificial Neural Network, etc.

⋆ Data Analysis: Time series data analysis (include financial data, weather data, satellite image data, etc).

⋆ Big Data: Classification and Visualization (include financial data, weather data, satellite image data, etc).

⋆ Mathematical Modeling and Simulation: Time series forecasting model for financial data, weather data, etc.

6.2 RESEARCH OUTLINES

Our current research mainly focus on power rehabilitation for Parkinson's disease (PD) patients, image processing and segmentation, and deep learning. PD is one of the severe neurodegenerative diseases. Our main research focus on designing power rehabilitation devices for PD patients. The main goal of this research is to help patients to improve the process of rehabilitation. We also focus on analysis of MRIs of PD patients. A brief outlines of our on-going research in the context of power rehabilitation for Parkinson's disease (PD) patients are as:

1. Designing useful sensor devices and rehabilitation systems to help PD patients improve the process of rehabilitation.

2. Developing deep learning model to identify user's gait and status of body balance.

3. Developing decision-making system to generate effective decision-rules during rehabilitation procedure.

4. Analyzing MRIs of PD patients during rehabilitation procedure to represent inherited uncertainty.

5. Developing recognizing and visualizing methods for MRIs of PD patients.

Our previous research focused on developing theories, models and algorithms to pertaining to advance prediction of time series dataset. We had focused on Big Data time series analysis, spatio-temporal remotely sensed high resolution satellite image analysis, daily temperature prediction, summer monsoon rainfall prediction, financial data forecasting, and so on. Our work was previously centered around the study of fuzzy set theory (both Type-1 and Type-2 fuzzy sets), neutrosophic set theory, artificial neural network and machine learning to address the various problems associated with time series data clustering, rule-mining, decision-making, and uncertainty and forecasting. For resolving various problems related to time series data analysis and forecasting, we proposed various algorithms and models. We also studied the social behaviors of animals to design new optimization algorithms. Then, we started to work in development of quantum based optimization algorithm. Below is a brief summary of some of my previous research contributions as:

⋆ **Deal with univariate time series dataset:** In this line of study, we had tried to analyze and forecast time series dataset, which was univariate by nature. This type of modeling contains various problems, such as determination of the lengths of intervals, determination of fuzzy logical relations, and defuzzification operation. For resolving these problems, we proposed hybrid and non-hybrid models. In the category of hybrid modeling, we used the fuzzy set theory along with artificial neural network.

⋆ **Deal with two-variate time series dataset:** In this category of study, we had tried to design model, which can easily deal with two factors of time series dataset during modeling. This type of modeling contains various problems, such as determination of degree of memberships of both the factors together, define the logical relationships between them, and defuzzification operation. This kind of problem had been resolved by introducing two factors model based on hybridization of fuzzy set and artificial neural network.

⋆ **Deal with multivariate time series dataset:** In real-time, one observation always relies on several observations. To improve the forecasting accuracy, all these observations can be incorporated in forecasting models. Therefore, resolve such kind of problem, a Type-2 fuzzy set theory based forecasting model had been introduced. Application of the proposed model was successfully shown by forecasting the stock index prices of MNCs. In this study, role of optimization algorithm was also demonstrated.

⋆ **Granular computing and time series dataset:** In this study, first time application of granular computing was shown to deal with multivariate time series dataset. Here, we used the granular computing approach to discretize multivariate time series dataset to obtain granular intervals. In this line of study, we proposed our own bio-inspired algorithm. This algorithm mimics the behaviors of movement of goose in the sky. This algorithm had been successfully integrated in the proposed model to enhance the forecasting accuracy.

⋆ **Computational models for advance prediction of Indian Summer Monsoon Rainfall (ISMR):** Forecasting the monsoon temporally is a major scientific issue in the field of monsoon meteorology. The ensemble of statistics and mathematics

had increased the accuracy of forecasting of the ISMR up to some extent. But due to the nonlinear nature of the ISMR, its forecasting accuracy was still below the satisfactory level. Mathematical and statistical models required complex computing power. To resolve this issue, we designed computational based expert systems for the ISMR forecasting. In this line of study, three significant models were designed, which are based on the artificial neural network, hybridization of Fuzzy-Entropy-Neuro, and fuzzy set theory.

⋆ **Deal with various problems of time series forecasting:** To deal with various problems associated with time series data forecasting, such as time series data clustering, rule determination, fuzzification, defuzzification, uncertainty representation, and so on, various computational techniques were developed.

⋆ **Deal with change detection problem:** Remotely sensed high-resolution satellite images contain various information in terms of changes. By analyzing this information very minutely, changes occurred in various atmospheric phenomena can be identified. In this line of study, we designed a change detection model based on fuzzy set theory. This study can detect the changes in the atmosphere in a very fine-grained level.

⋆ **Simulation and Modeling of Big Data Time Series:** I had been involved in a project, entitled as a "Simulation and Modeling of Big Data Time Series", as the Principal Investigator. This project was funded by the Department of Science & Technology (SERB), Govt. of India, in 2017. The implementation of this project leads to the development of following new techniques and algorithms, as:

1. Developing of a new big data multivariate time series clustering algorithm.
2. Developing of a new rule mining or filtering technique.
3. Developing of a new rule importance determination technique.
4. Developing of a new heuristic search technique for the determination of orders of rules.
5. Developing of a new fuzzification and defuzzification techniques.
6. Developing of a new bio-inspired optimization algorithm.

7 PATENTS/COPYRIGHTS

PAT 1-2019: P. Singh and G. Dhiman. Development of Tool and Technique for High-Resolution Satellite Image Data Compression using Fuzzy Set Theory. *Indian Copyright Reg. No. 12105/2019*

8 BOOKS

BK 1-2023: P. Singh. Biomedical Image Analysis: Special Applications in MRIs and CT Scans. Publisher: Springer International Publishing, ISBN: 9819999383, Year: 2023.

BK 2-2015: P. Singh. Applications of Soft Computing in Time Series Forecasting: Simulation and Modeling Techniques. Publisher: Springer, Heidelberg (Germany), ISBN: 978-3-319-26292-5, 2015.

Overview of the Book: Biomedical Image Analysis: This book provides an indepth study of biomedical image analysis. It reviews and summarizes previous research work in biomedical image analysis and also provides a brief introduction to other computation techniques, such as fuzzy sets, neutrosophic sets, clustering algorithm and fast forward quantum optimization algorithm, focusing on how these techniques can be integrated into different phases of the biomedical image analysis. In particular, this book describes novel methods resulting from the fuzzy sets, neutrosophic sets, clustering algorithm and fast forward quantum optimization algorithm. It also demonstrates how a new quantum-clustering based model can be successfully applied in the context of clustering the COVID-19 CT scans. Thanks to its easy-to-read style and the clear explanations of the models, the book can be used as a concise yet comprehensive reference guide to biomedical image analysis, and will be valuable not only for graduate students, but also for researchers and professionals working for academic, business and government institutes and medical colleges.

Overview of the Book: Applications of Soft Computing in Time Series Forecasting: In the modern competitive world, government and business organizations have to make the right decision in time depending on the information at hand. As large amounts of historical data are readily available, the need of performing accurate forecasting of future behavior becomes crucial to arrive at good decisions. Therefore, demand for a definition of robust and efficient forecasting techniques is increasing day by day. A successful time series forecasting depends on an appropriate model fitting.

Time series data are highly non-stationary and uncertain in nature. Therefore, forecasting of time series using statistical or mathematical techniques is extremely difficult. The scientific community has been attracted by soft computing (SC) techniques in recent years to overcome these limitations. The SC is an amalgamation of different methodologies, such as fuzzy sets, neural computing, rough sets, evolutionary computing and probabilistic computing, to solve real world problems. The present work is a comprehensive examination of designing models for time series
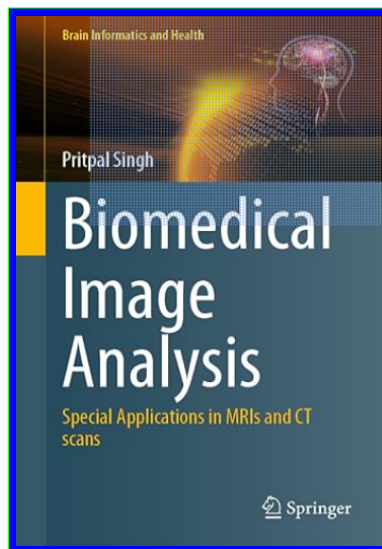
forecasting based on SC techniques, especially fuzzy time series (FTS).

This book provides in-depth study of various issues and problems associated with the FTS modeling approaches in time series forecasting. Empirical studies suggest that hybridization of the SC techniques can improve the forecasting accuracy as compared to utilization of conventional techniques. Apart from exhaustive literature survey on applications of FTS in time series forecasting, we provide improved methods for forecasting based on the FTS, and its hybridization with neural networks and particle swarm optimization.

9   JOURNAL PUBLICATIONS (SCI)

SCI 1-2024: P. Singh, Bhavna Saini, and Y.-P. Huang, AECA: An ambiguous-entropy clustering algorithm for the analysis of resting-state fMRISs of human brain and their functional connections. *Modern Physics Letters B (World Scientific)*, XX (X), XX–XX, 2024. [IF = 1.9 (2022)]

SCI 2-2024: P. Singh and Y.-P. Huang, AKDC: Ambiguous Kernel Distance Clustering Algorithm for COVID-19 CT Scans Analysis. *IEEE Transactions on Systems, Man and Cybernetics: Systems (IEEE)*, XX (X), XX–XX, 2024. [IF = 8.7 (2022)]

SCI 3-2024: P. Singh, From Ambiguous Sets to Single-Valued Ambiguous Complex Numbers: Applications in Mandelbrot Set Generation and Vector Directions. *Modern Physics Letters B (World Scientific)*, XX (X), XX–XX, 2024. [IF = 1.9 (2022)]

SCI 4-2024: Nihalani and others, Long Short-Term Memory (LSTM) model for Indian sign language recognition. *Journal of Intelligent & Fuzzy Systems (IOS Press)*, 46 (4), 11185–11203, 2024. [IF = 2 (2023)]

SCI 5-2024: P. Singh and Y.-P. Huang, An ambiguous edge detection method for computed tomography scans of coronavirus disease 2019 cases. *IEEE Transactions on Systems, Man and Cybernetics: Systems (IEEE)*, 54 (1), 352–364, 2024. [IF = 8.7 (2022)]

SCI 6-2023: P. Singh and Y.-P. Huang, A four-valued ambiguous logic: Application in designing ambiguous inference system for control systems. *International Journal of*

SCI 30-2016: P. Singh. High-order fuzzy-neuro-entropy integration based expert system for time series forecasting. *International Journal of Neural Computing and Applications (Springer)*, 28(12), 3851–3868, 2016. [IF = 1.569 (2014)]

SCI 31-2016: P. Singh. Rainfall and Financial Forecasting using Fuzzy Time Series and Neural Networks Based Model. *International Journal of Machine Learning and Cybernetics (Springer)*, 9(3), 491–506, 2016. [IF = 1.11 (2015)]

SCI 32-2015: P. Singh. A brief review of modeling approaches based on fuzzy time series. *International Journal of Machine Learning and Cybernetics (Springer)*, 8(2), 397–420, 2015. [IF = 1.11 (2015)]

SCI 33-2014: P. Singh and B. Borah. Forecasting stock index price based on M-factors fuzzy time series and particle swarm optimization. *International Journal of Approximate Reasoning (Elsevier)*, 55, 812–833, 2014. [IF = 1.729 (2013)]

SCI 34-2013: P. Singh and B. Borah. High-order fuzzy-neuro expert system for daily temperature forecasting. *Knowledge-Based Systems (Elsevier)*, 46, 12–21, 2013. [IF = 4.104 (2013)]

SCI 35-2013: P. Singh and B. Borah. An efficient time series forecasting model based on fuzzy time series. *Engineering Applications of Artificial Intelligence (Elsevier)*, 26, 2443–2457, 2013. [IF = 1.625 (2013)]

SCI 36-2013: P. Singh and B. Borah. Indian summer monsoon rainfall prediction using artificial neural network. *Stochastic Environmental Research and Risk Assessment (Springer)*, 27(7), 1585–1599, 2013. [IF = 1.961(2013)]

SCI 37-2012: P. Singh and B. Borah. An effective neural network and fuzzy time series-based hybridized model to handle forecasting problems of two factors. *Knowledge and Information Systems (Springer)*, 38(3), 669–690, 2012. [IF = 2.225(2012)]

10   JOURNAL PUBLICATIONS (SCOPUS)

Scopus 1-2023: P. Singh, An investigation of ambiguous sets and their application to decision-making from partial order to lattice ambiguous sets. *Decision Analytics Journal (Elsevier)*, 08, 100286, 2023.

Scopus 2-2023: P. Singh, A general model of ambiguous sets to a single-valued ambiguous numberswith aggregation operators. *Decision Analytics Journal (Elsevier)*, 08, 100260, 2023.

Scopus 3-2023: P. Singh, Ambiguous set theory: A new approach to deal with unconsciousness and ambiguousness of human perception. *Journal of Neutrosophic and Fuzzy Systems (American Scientific Publishing Group)*, 05(01), 52–58, 2023.

Scopus 4-2022: P. Singh, Marcin Wątorek, Anna Ceglarek, Magdalena Fąfrowicz, and Paweł Oświęcimka, Analysis of fMRI Time Series: Neutrosophic-Entropy Based Clustering Algorithm. *Journal of Advances in Information Technology*, 13(3), 224–229, 2022.

11   BOOK CHAPTERS

BC 1-2017: P. Singh.   Emerging Research on Applied Fuzzy Sets and Intuitionistic Fuzzy Matrices, chapter *An Efficient Method for Forecasting using Fuzzy Time Series*, pp.287–304, IGI Global (USA), 2017.

BC 2-2015: P. Singh.   Computational Intelligence for Big Data Analysis, volume 19, chapter *Big Data Time Series Forecasting Model: A Fuzzy-Neuro Hybridize Approach*, pp.55–71, Springer-Verlag/Heidelberg, 2015.

BC 3-2015: P. Singh.   Hybrid Soft Computing Approaches: Research and Applications, chapter *Neuro-Fuzzy Hybridized Model for Seasonal Rainfall Forecasting: A Case Study in Stock Index Forecasting*, pp.361–385, Springer-Verlag/Heidelberg, 2015.

BC 4-2023: S.K. Singh, M. Borah and **P. Singh**. Introduction to Computer and Applied Mathematics, chapter *Comparative study of Genetic algorithms, Modified-PSO, and Modified-Simulated Annealing on some Difficult Benchmark Test Functions*, pp.116–124, RM Research International Pvt. Ltd. (Singapore), 2023.

12   INTERNATIONAL CONFERENCES

IC 1-2024: P. Singh. Ambiguous sets and various distance measurements. *Proc. of 6th International Conference on Soft Computing and its Engineering Applications (icSoft-Comp2024)*, Bangkok, Thailand, pp. XX–XX, Dec. 10–12, 2024.

IC 2-2021: P. Singh, M. Wątorek, A. Ceglarek, M. Fąfrowicz and P. Oświęcimka. Analysis of fMRI Time Series: Neutrosophic-Entropy based Clustering Algorithm. *Proc. of 8th Intl. Conference on Soft Computing and Machine Intelligence (ISCMI 2021)*, Cairo, Egypt, pp. XX–XX, Nov. 26–27, 2021.

IC 3-2020: P. Singh, Y.-P. Huang, W.-J. Chu and J.-H. Lee. A Fuzzy-Entropy and Image Fusion Based Multiple Thresholding Method for the Brain Tumor Segmentation. *Proc. of IEEE Int. Conf. on Systems, Man, and Cybernetics (SMC 2020)*, Toronto, Canada, pp. 2446–2451, Oct. 11–14, 2020.

IC 4-2019: P. Singh, Y.-P. Huang and T.-T. Lee. A Novel Ambiguous Set Theory to Represent Uncertainty and its Application to Brain MR Image Segmentation. *Proc. of IEEE Int. Conf. on Systems, Man, and Cybernetics (SMC 2019)*, Bari, Italy, pp.2460–2465, Oct. 06–09, 2019.

IC 5-2019: P. Singh, Y.-P. Huang and T.-T. Lee. A Method for High-Resolution Satellite Image Compression using Type-1 and Type-2 Fuzzy Sets. *Proc. of IEEE Int. Conf. on System and Engineering (ICSSE 2019)*, Dong Hoi City, Quang Binh, Vietnam, pp.103–108, July 19–21, 2019.

IC 6-2018: P. Singh and K. Rabadiya. High-Resolution Satellite Image Compression using Uncertain Color Space Based Method. *Proc. of 24th Annual Int. Conf. on Advanced Computing and Communications (ADCOM 2018)*, International Institute of Information Technology (IIIT), Bangalore, pp.XX, Sep. 21–23, 2018.

IC 7-2018: P. Singh and K. Rabadiya. Information Classification, Visualization and Decision-Making: A Neutrosophic Set Theory Based Approach. *Proc. of 2018 IEEE Int. Conf. on Systems, Man, and Cybernetics (SMC 2018)*, Miyazaki, Japan, pp.409–414, Oct. 7–11, 2018.

IC 8-2017: P. Singh and K. Rabadiya. Uncertain Information Classification: A Four-Way Decision Making Approach. *Proc. of 9th Int. Conf. on Advances in Pattern Recognition (ICAPR)*, ISI, Bengluru, India, pp.1–9, Dec. 27–30, 2017. [Acceptance Rate: 33%]

IC 9-2017: P. Singh and G. Dhiman. A Fuzzy-LP Approach in Time Series Forecasting. *Proc. of 7th Int. Conf. on Pattern Recognition and Machine Intelligence (PReMI 2017)*, ISI Kolkata, India, pp.243–253, Dec. 5–8, 2017. [Acceptance Rate: 33%]

IC 10-2012: P. Singh and B. Borah. Prediction of all India summer monsoon rainfall using an artificial neural network. *Proc. of Opportunities and Challenges in Monsoon Prediction in a Changing Climate (OCHAMP' 2012)*, IITM, Pune, India, Feb. 21–25, 2012.

13 NATIONAL CONFERENCES

NC 1-2011: P. Singh and B. Borah. An Efficient Method For Forecasting Using Fuzzy Time Series. *NCTMI' 11*, Tezpur University, Assam, India, pp.67–75, 2011.

NC 2-2011: P. Singh and B. Borah. A Multi-Purpose Forecasting Model Based On Fuzzy Time-Series. *IDRBT Colloquium, IDRBT*, Hyderabad, India, 2011.

14 CITATION DETAILS

⋆ Citations: 1489 (Till June 08, 2023)

⋆ h-index: 22

⋆ i10-index: 34

⋆ Total Impact Factor (IF): >50

15 REVIEW ACTIVITIES

⋆ Knowledge-Based System (Elsevier)

⋆ International Journal of Approximate Reasoning (Elsevier)

⋆ IEEE Transactions on Systems, Man and Cybernetics: Systems

⋆ Computational Economics (Springer)

⋆ Applied Soft Computing (Elsevier)

⋆ Modern Physics Letters B (World Scientific)

16   FUNDING RESEARCH & CONSULTANCY

⋆ Title of the Project: Simulation and Modeling of Big Data Time Series

⋆ Overview of the Project: Big data evolve as a new research domain in the era of 21st century. This domain concerns with the study of voluminous datasets with multiple factors, whose sizes are rapidly growing with the time. These types of datasets can be generated from various autonomous sources, such as scientific experiments, engineering applications, government records, financial activities, etc. With the rise of big data concept, demand for a new time series prediction models emerged. Hence, this study will focus on designing soft computing (SC) based big data time series forecasting models. The performance of the model will be verified and validated with various real world time series datasets. The implementation of this project leads to the development of various new techniques and algorithms, as: (a) Development of new big data multivariate time series clustering algorithm, (b) Development of new rule mining or filtering technique, (c) Development of new rule importance determination technique, (d) Development of new heuristic search technique for the determination of orders of rules, (e) Development of new fuzzification and defuzzification techniques, (f) Development of new bio-inspired optimization algorithm, and (g) At last, develop various time series forecasting models based on type and features of data using big data time series and SC techniques.

⋆ Funding Date: Feb. 13, 2017

⋆ Funding Agency: Department of Science and Technology (SERB), Govt. of India

⋆ Amount (in Lac): 23.78 (US $35,000$ approx.)

⋆ Duration: 4 Years

⋆ Role: Principal Investigator

⋆ Status: Closing on dated Feb. 13, 2019

17   ACADEMIC ACHIEVEMENTS

AA 1-2020: Recipient of Visiting Research Adjunct Professor Fellowship from the Foundation for Polish Science, Poland for pursuing research in **Institute of Theoretical Physics, Jagiellonian University (Nov. 16, 20–March 31, 2022)**

AA 2-2019: Recipient of financial assistance from the **National Taipei University of Technology, Taiwan**, for participating in **IEEE ICSSE 2019–IEEE International Conference on System and Engineering, Vietnam (July 19–21, 2019)**

AA 3-2019: Recipient of financial assistance from the **Taiwan Association of Systems Science and Engineering (TASSE), Taiwan**, for participating in **IEEE ICSSE 2019– IEEE International Conference on System and Engineering, Vietnam (July 19– 21, 2019)**

AA 4-2018: Recipient of Postdoctoral Research Fellowship from the Ministry of Science and Technology (MOST), Taiwan for pursuing research in **Department of Electrical Engineering, National Taipei University of Technology, under Grant No.: MOST 108-2811-E-027-500 (Mar. 01, 2019–Sep. 31, 2020)**

AA 5-2018: Recipient of financial assistance from the DST-SERB, Govt. of India, for participating in **IEEE SMC 2018–IEEE International Conference on Systems, Man and Cybernetics, Japan (Oct. 07–10, 2018)**

AA 6-2010: Qualified **Graduate Aptitude Test in Engineering**, held on Feb. 10, 2010, conducted by Indian Institute of Technology (IIT), India

AA 7-2010: Recipient of **Rajiv Gandhi National Fellowship Award** in 2010 from University Grant Commission (UGC), India, for pursuing full-time Ph.D. in Computer Science and Engineering

18   BEST PAPER AWARD

BP 1-2019: P. Singh, Y.-P. Huang and T.-T. Lee. A Method for High-Resolution Satellite Image Compression using Type-1 and Type-2 Fuzzy Sets. *Proc. of IEEE Int. Conf. on System and Engineering (ICSSE 2019)*, Dong Hoi City, Quang Binh, Vietnam, pp.103–108, July 19–21, 2019.

19   MEMBERSHIP OF PROFESSIONAL BODIES

⋆ Taiwan Association of Systems Science and Engineering, Taiwan

20   TRAVEL HISTORY

⋆ Japan (Oct. 7–10, 2018) to participate in **IEEE Int. Conf. on Systems, Man and Cybernetics (SMC 2018)**

⋆ Taiwan (Feb. 27, 2019 to till date) to join as a Postdoctoral research fellow in **National Taipei University of Technology, Taipei, Taiwan**

⋆ Vietnam (July 17–23, 2019) to participate in **IEEE Int. Conf. on System and Engineering**

21   INDUSTRIAL TRAINING

⋆ JAVA Programming (June, 2008–Aug., 2008): Naresh Technologies, Hyderabad, Duration: 3 months

⋆ IT Trainee (Apr., 2008–Sep., 2008): Galaxie Software Solutions, Hyderabad (India), Duration: 6 months, **Environment:** J2EE, Wireless Markup Language & Oracle 10g

⋆ Project Trainee (July, 2008–Oct., 2008): Techworld Solutions, Hyderabad (India), Duration: 4 months, **Environment:** J2EE (Servelet) & Oracle 10g

22   FACULTY INDUCTION/ORIENTATION PROGRAMME

⋆ Faculty Induction/Orientation Programme (April 23–May 22, 2023): Organized by Ramanujan College, University of Delhi, India. Duration: 01 Month

⋆ Faculty Development Programme (May 29–June 04, 2023): Organized by Ramanujan College, University of Delhi, India. Duration: 01 Week

23   PARTICIPATE IN WORKSHOPS

⋆ PKI Outreach Programme (Aug. 27, 2009): Organized by C-DAC, Bangalore, in the Department of Computer Science & Engineering, Tezpur University, Assam (India)

⋆ Network Security (June 9–10, 2010): Organized by the Department of Computer Science & Engineering, Tezpur University, Assam (India)

⋆ Soft Computing (Dec. 20–23, 2010): Organized by ISI, Kolkata (India), in the Department of Computer Science & Engineering, Tezpur University, Assam (India)

⋆ Faculty Development/Teacher's Training Program (July 15–26, 2013): Organized by NITTR, Chandigarh, Punjab (India)

⋆ Attended Faculty Development/ Teacher's Training Program (Nov. 13–22, 2017): Organized by CHARUSAT, CHARUSAT Campus, Anand-388421, Gujarat (India) on Multiple Strategies for Creativity, Problem Solving and Innovation

⋆ 23rd Innovation Conference on Innovation & Change Management (Feb. 17, 2018.): Organized by Ahmedabad Management Association (AMA), in Ahmedabad Management Association, Ahmedabad (India)

24   INVITED SPEAKER/RESOURCE PERSON

RP 1-2024: Resource Person (July 16-22, 2024): 2024 One Week International e-FDP on **Technological Trends for Sustainability**, Symbiosis Institute of Computer Studies and Research, Pune, Maharashtra, India

RP 2-2023: Resource Person (June 05, 2023): 2023 National seminar on **Perspectives of Data Science**, Division of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Chennai, India

RP 3-2023: Invited Talk (May 17-18, 2023): 2023 Int. Conf. on **Challenges and Opportunities Science, Engineering and Technology for Societal Development (INCOSETSD-2023)**, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India

RP 4-2023: Invited Talk (Mar. 24, 2023): Topic on **Ambiguous D-Means Fusion Clustering Algorithm Based on Ambiguous Set Theory: Special Application in Clustering of CT Scan Image of COVID-19**, COER University, Roorkee, Uttarakhand, India

RP 5-2023: Resource Person (Feb. 24–25, 2023): 2023 Int. Conf. on **Statistics and Data Science (SDS2023)**, Sadguru Gadage Maharaj College, Karad, Maharashtra, India

RP 6-2021: Invited Speaker (Dec. 01–03, 2021): 2021 Int. Conf. on **Medical Imaging Science and Technology (MIST2021)**, China

RP 7-2021: Resource Person (Nov. 08–13, 2021): One week online STTP on **Recent Advancement in AI and Machine Learning**, Kaziranga University, Jorhat, Assam, India

RP 8-2020: Invited Speaker (Dec. 11–12, 2020): 2nd Int. Conf. on **Soft Computing and its Engineering Applications (icSoftComp2020)**, CHARUSAT Campus, Anand, Gujarat, India

25 CONTRIBUTIONS TO SEMINARS/CONFERENCES

CC 9-2023: Technical Program Committee (Dec. 07–09, 2023): 5th Int. Conf. on **Soft Computing and its Engineering Applications (icSoftComp2023)**, Smt. Chandaben Mohanbhai Patel Institute of Computer Applications, Charotar University of Science and Technology (CHARUSAT), Changa, India

CC 10-2023: Organizing Committee Member (Feb. 08–10, 2023): Int. Conf. on **Disability and the Everyday: Interdisciplinary Perspectives (CURaj-IDSC 2023)**, Department of English, School of Humanities and Languages, Central University of Rajasthan, Ajmer, India

CC 11-2023: International Program Committee (Apr. 23–24, 2023): 7th Int. Conf. on **Intelligent Systems, Metaheuristics and Swarm Intelligence (ISMSI 2023)**, Kuala Lumpur, Malaysia

CC 12-2022: International Program Committee (Apr. 09–10, 2022): 6th Int. Conf. on **Intelligent Systems, Metaheuristics and Swarm Intelligence (ISMSI 2022)**, Seoul, Republic of Korea

CC 13-2021: International Program Committee (Dec. 11–12, 2021): 3rd Int. Conf. on **Soft Computing and its Engineering Applications (icSoftComp2021)**, CHARUSAT Campus, Anand, Gujarat, India

CC 14-2021: International Program Committee (Nov. 26–27, 2021): 8th Int. Conf. on **Soft Computing and Machine Intelligence (ISCMI 2021)**, Cairo, Egypt

CC 15-2020: International Program Committee (Dec. 11–12, 2020): 2nd Int. Conf. on **Soft Computing and its Engineering Applications (icSoftComp2020)**, CHARUSAT Campus, Anand, Gujarat, India

CC 16-2019: Program Chairman (July 19–21, 2019): IEEE Int. Conf. on **System and Engineering (ICSSE 2019)**, Dong Hoi City, Quang Binh, Vietnam

CC 17-2017: Program Co-Chairs (Dec. 1–2, 2017): 1st Int. Conf. on **Soft Computing and its Engineering Applications (icSoftComp2017)**, CHARUSAT Campus, Anand, Gujarat, India

26 ACADEMIC SERVICE

⋆ Member, IQAC, CMPICA, CHARUSAT Campus

⋆ Member, BOS, CMPICA, CHARUSAT Campus

⋆ Member, Doctoral Research Committee, Faculty of Computer Applications, CHARUSAT Campus

27 EDITORIAL SERVICE

⋆ Associate Editor: Journal of Intelligent & Fuzzy Systems (IOS Press), IF=1.851 (SCI)

⋆ Academic Editor: Computational and Mathematical Methods (Wiley)

⋆ Associate Editor: Systems and Soft Computing (Elsevier)

⋆ Associate Editor: Frontiers in Neuroinformatics (Frontiers)

28 GUEST EDITOR

⋆ Special Issue on: Soft Computing for Real Time Engineering Applications
Journal: SN Computer Science (Springer),
Guest Editors:
Kanubhai K. Patel, Charotar University of Science and Technology, Changa, India.
Pritpal Singh, The Jagiellonian University, Poland.

⋆ Special Issue on: Fuzzy Soft Computing in Complex Real-Time Engineering
Journal: International Journal of Fuzzy System Applications (IGI Global)
Guest Editors:
Kanubhai Patel, Charotar University of Science and Technology, India.
Pritpal Singh, The Jagiellonian University, Poland.
Anand Nayyar, Duy Tan University, Vietnam.

29 COURSES TAUGHT

⋆ Data Mining (Level:PG)

⋆ Database Management System (Level:PG)

⋆ Software Engineering (Level:PG)

⋆ Scripting Language (Level:UG)

⋆ Software Quality Assurance (Level:PG)

⋆ HCI (Level:PG)

30   PERSONAL INFORMATION

* **Name:** Dr. Pritpal Singh

* **Nationality:** Indian

* **Gender:** Male

* **Date of Birth:** 18-Feb-1982

* **Place of Birth:** Tinsukia, Assam (India)

* **Home Address:** H.No.: 3, Hari Krupalu Ishwar Residency, Near Sarkari Davakhana, Railway Station Road, Karamsad-388325, Anand, Gujarat (India)

* **Marital Status:** Married to Mrs. Manjit Kour (Date of Birth: 28-Feb-1982)

* **No. of Children & DOB:** One Child (Mr. Simarpreet Singh (Date of Birth: 27-Sep-2014))

* **Hobby:** Reading Books, Watching Movies & Travelling

* **Strength:** Punctual, Good Learning Ethics & Hard Working

* **Language Known:** Hindi (Advanced proficiency) & English (Advanced proficiency)

* **Mobile Phone:** +91-9824106223

* **E-mail:** drpritpalsingh82@gmail.com

31   REFERENCES

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