Dr. Muhammad Aminul Haque Akhand

Professor
Department of Computer Science and Engineering (CSE)
Khulna University of Engineering & Technology (KUET)

Project Director as Deputation, Improving Computer and Software
Engineering Tertiary Education Project (www.icsetep.ugc.gov.bd)

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A. Education:

Duration/ Year	Degree, Institute and Result
April 2006 To March 2009	**Doctor of Engineering (Ph.D.): System Design Engineering on Intelligent Information Systems** **University of Fukui, Japan** Grade earned: A out of A (Theory courses) *Thesis: "Ensembles of Diverse Neural Networks "*
October 2003 To March 2006	**Master of Engineering (M. Eng.): Human and Artificial Intelligent Systems** **University of Fukui, Japan** Grade earned: A out of A (Theory courses) *Thesis: "A Hybrid Sequential and Simultaneous Training Algorithm for Constructing Compact Neural Network Ensemble"*
August 1994 To March 1999	**Bachelor of Science (B. Sc.): Electrical and Electronic Engineering** **Khulna University of Engineering and Technology (KUET), Bangladesh** Result : First class (**5**th position) Grade earned: 3.41 out of 4.0 *Thesis: "A Software Development on Central Class Scheduling of BIT, Khulna"*
June 1991 To October 1993	**Higher Secondary Certificate Examination** Shahid Smrity Adarsha College, Nandail, Mymensingh, Bangladesh Result : First division, Mark: 71.4%
March 1991	**Secondary School Certificate Examination** Bangladesh Railway High School, Bhairab Bazar, Kishorgang, Bangladesh Result: First division, Mark: 67.2%

B. Educational and Research Fellowship / Scholarship:

➢ Japanese government Postdoctoral Follow-up Research Fellowship program at University of Fukui, Japan; October – December, 2017

➢ Japanese government scholarship (Monbusho) for Master and Ph.D. program at University of Fukui, Japan; October, 2003 to March, 2009

➢ Merit scholarship of KUET, Khulna; 1994-1998

➢ Scholarships in Junior Secondary School; 1989-1990

C. Professional Experiences:

Khulna University of Engineering & Technology (KUET), Bangladesh
Department of Computer Science and Engineering (CSE)
Professor (Grade 2)
   KUET Service History: Lecturer (May 07, 2001 to February 17, 2003), **Assistant Professor** (February 18 2003 to December 31, 2011), **Associate Professor** (January 01, 2012 to March 03, 2014) and **Professor** (March 04, 2014 to Till)
   Responsibility: Teaching and Research

University of Fukui, Japan
Graduate School of Engineering
   Visiting Professor (October 01, 2017 to December 29, 2017)
   Responsibility: Teaching and Research

Kernel Systems Limited, Dhaka, Bangladesh
   Programmer (August 01, 2000 to May 06, 2001)
   Nature of Work: Software development, system analysis and design for commercial banking systems.

Sakaimex LTD., Dhaka, Bangladesh
   Database Management Section (To computerize registration and result of National University, Bangladesh)
   Programmer (July 12, 1999 to July 31, 2000)
   Nature of Work: Software development for registration & result processing of National University, Bangladesh.

D. Project Management / Managerial Experiences:

➢ **Project Director, Improving Computer and Software Engineering Tertiary Education Project (ICSETEP)** funded by Asian Development Bank (ADB) and Govt. of Bangladesh. (July 2023- Jun 2028)

ICSETEP is a unique project in Bangladesh to improve tertiary level CSE/IT education to meet the challenges of 4IR and to lead of the country in IT sectors. Secondary and Higher Education Division (SHED) of the Ministry of Education (MoE) is the project Executing Agency (EA) and University Grants Commission (UGC) of Bangladesh is the main Implementing Agency of ICSETEP.

ICSETEP is a significant national project with 100 Million USD ADB Loan financing to construct new CSE academic buildings, develop modern labs, and update curriculums in BUET, DU and JUST. Research, innovations, and some other components are open for all the universities to enhance CSE/ICT tertiary education in Bangladesh. As the Project Director, I am the key person as well as main responsible person to implement ICSETEP.

➢ **Manager, Integrated Automation of KUET of Higher Education Quality Enhancement Project (HEQEP)** of UGC funded by World Bank and Govt. of Bangladesh. (January 2011- Jun 2013)

Key Involvements / Major Tasks Performed: *Project Proposal Preparation; Recruitments of Staffs; Procurement of Goods (Servers, Generators, Computers and Other Equipment); Lead in Automation Software Development (Administrative, Academic, Account Sections); Periodic Report Submission and Project Completion Report Submission.*

- ➢ Technical Innovation, Research and Development Grant of Ministry of Science and Technology, Bangladesh for the project titled 'Development of an Intelligent Internet Browsing System for low educated people of Bangladesh', FY 2012-13.

  Key Involvements / Major Tasks Performed: *Project Proposal Preparation; Lead in Software Development and Project Completion Report Submission.*

- ➢ Grant for Natural Language Processing Lab Development at Dept. of CSE, KUET funded by Bangladesh Hi-Tech Park Authority (2018-19)
  Key Involvements / Major Tasks Performed: *Project Proposal Preparation; Equipment Specification, and Implementation.*

- ➢ Research Grant of KUET for the project titled 'Design and Development of Intelligent Software to Convert Traditional Bangla Fonts to Unicode Fonts', FY 2012-13.
  Key Involvements / Major Tasks Performed: *Project Proposal Preparation; Lead in Software Development and Project Completion Report Submission.*

- ➢ EEG Acquisition System Design and Development to Use in Autism Detection by UGC, Bangladesh (2020-21)
  Key Involvements / Major Tasks Performed: *Project Proposal Preparation; Design and Development of the EEG Device, and Project Completion Report Submission.*

E. Administrative Experiences:

- ➢ **Project Director, Improving Computer and Software Engineering Tertiary Education Project (ICSETEP)** in UGC as Deputation from KUET by the order of SHED. (November 2023- till date) (www.icsetep.ugc.gov.bd)
- ➢ **Manager, Integrated Automation of KUET of Higher Education Quality Enhancement Project (HEQEP)** of UGC funded by World Bank and Govt. of Bangladesh. (January 2011- Jun 2013)
- ➢ **Vice President (Admin)**, Bangladesh Computer Society (BCS), Khulna Branch 2020 to 2021.
- ➢ **Humanitarian Activity Coordinator (**2021 -2022), IEEE Bangladesh Section Executive Committee.
- ➢ **Head, Computational Intelligence Research Group (CIRG)** in the Department of Computer Science and Engineering at KUET (http://www.kuet.ac.bd/cse/compint/).
- ➢ **Head, Department of Computer Science and Engineering (CSE),** KUET as an additional duty from January 01, 2018 to December 31, 2019. (www.kuet.ac.bd/cse/).
- ➢ **Local Main Contact (LMC) Person, KUET Cisco Local Academy** from January 01, 2018 to December 31, 2019.
- ➢ **Associate Director (Academic and Research Wing)**, Institute of Information and Communication Technology, KUET as an additional duty from August, 2012 to March, 2014.(www.kuet.ac.bd/iict/).

F. Professional Trainings:

- ❖ **Training Course on Creative Teaching Techniques ,** March 22-24, 2002
  Organizer: Continuing Education Centre, Dhaka, Bangladesh

- ❖ **CISCO Networking Academy Instructor Course: Networks Fundamentals; Routing Protocol & Concepts; and Switching & Intermediate Routing,**
  Organizer: Bangladesh University of Engineering Technology (BUET), Dhaka, Bangladesh

- ❖ **Cisco Training on Internet of Things (IoT)**, April 27-28, 2018
  Organizer: Cisco Local Academy, KUET

- ❖ **Training on Intellectual Property Commercialization & Business Model Canvas**, Jan. 31 – Feb. 01, 2019
  Organizer: Putra Science Park, University Putra Malaysia (UMP), Malaysia

- ❖ **ITEE Training for Trainers**, January 24-27, 2021
  Organizer: Bangladesh Computer Council (BCC) and Japan International Cooperation Agency (JICA)

❖ **Workshop on ADB's Procurement and Financial Policies**, May 26-27, 2024
Organizer: Bangladesh Residence Mission (BRM), Asian Development Bank (ADB)

G. Experience in Curriculum Development:

As the head of the department 2019-2020, I performed principal role to develop curriculum of CSE, KUET for BAETE Accreditation. I was also involved in syllabus and curriculum development several other public and private universities of Bangladesh.

H. Workshop and Seminar Organization:

➢ **Organizer, Workshop on Bangla Natural Language Processing with Deep Learning** at Dept. of CSE, KUET on June 30, 2018.

➢ **Organizer, Seminar on Cybersecurity, IoT & Networking** at Dept. of CSE, KUET on October 10, 2018.

➢ **Organizer, Seminar on Engineers' Path to Entrepreneurship Utilizing IT Incubator** at Dept. of CSE, KUET on March 30, 2019.

I. Editorial Board Member of International Journals:

➢ International Journal of Computer Science, Science Publications, USA, Australia and UAE (https://thescipub.com/jcs)

➢ International Journal of Image, Graphics and Signal Processing (IJIGSP), MEC Press, Hong Kong (http://www.mecs-press.org/ijigsp)

➢ International Journal of Electronics Communication and Computer Engineering (IJECCE), India (http://www.ijecce.org/)

➢ Oriental Journal of Computer Science and Technology (OJCST), India (http://www.computerscijournal.org/)

➢ International Journal of Research Studies in Computer Science and Engineering, India (https://www.arcjournals.org/international-journal-of-research-studies-in-computer-science-and-engineering/)

J. Reviewer of International Journals:

➢ Scientific Reports, Nature Journal (https://www.nature.com/srep/)

➢ IEEE Transactions on Neural Networks and Learning Systems (IEEE-TNNLS) (https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=5962385)

➢ IEEE Transactions on Cognitive and Developmental Systems (IEEE-TCDS) (https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7274989)

➢ IEEE Transactions on Cybernetics (IEEE-TCYB) (https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=6221036)

➢ IEEE Access (http://ieeeaccess.ieee.org/)

➢ Applied Soft Computing, Elsevier (https://www.journals.elsevier.com/applied-soft-computing/)

➢ Neural Computing and Applications (NCAA), Springer (http://link.springer.com/journal/521)

➢ Artificial Intelligence Review (AIR), Springer (http://link.springer.com/journal/ 10462)

➢ Expert Systems, Wiley (https://onlinelibrary.wiley.com/journal/14680394)

➢ Pattern Recognition Letters, Elsevier (https://ees.elsevier.com/prletters/) *Certified as Outstanding Contribution in Reviewing 2017*

➢ Engineering Science and Technology, an International Journal (JESTECH), Elsevier (https://www.journals.elsevier.com/engineering-science-and-technology-an-international-journal/) *Certified as Outstanding Contribution in Reviewing 2017*

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K. PhD Thesis Reviewer:
- ANNA University, Chennai, India
- Sathyabama University, Chennai, India
- St. Peter's University, Chennai, India
- Bharathiar University, Tamil Nadu, India
- University of Dhaka, Bangladesh

L. PG Thesis Supervision: Thesis Title and Degree Award Time

1. A Precise Evolutionary Approach to Solve Multivariable Functional Optimization - June 2011

2. Particle Swarm Optimization with Partial Search to Solve Traveling Salesman Problem - November 2013

3. University Class Scheduling using Ant Colony Optimization with Selective Population - March 2015

4. Highly Constrained University Course Scheduling using Hybrid Particle Swarm Optimization - May 2015

5. Solving Capacitated VRP through Clustering with Variant Sweep Algorithm and Route Optimization using SI - May 2016

6. Handwritten Bangla Numeral Recognition Using Deep Neural Networks - July 2017

7. University Course Scheduling using Prominent Nature Inspired Techniques - April 2019

8. Speech Enhancement Using Convolutional Denoising Auto-Encoder - May 2019

9. Noisy Image Classification using Autoencoders and Convolutional Neural Network - June 2019

10. Improvement of Face Detection incorporating Illumination-based Robust Skin Color Measure - June 2019

11. Handwritten Numeral Superposition to Printed Form Using Deep AutoEncoder and Recognition Using Convolutional Neural Network – September 2019

12. Approach to Solve Traveling Salesman Problem by Ant Colony Optimization with Adaptive Visibility – December 2021

13. Emotion Recognition from EEG Channel Connectivity Feature Map Using Convolutional Neural Network – November 2022

14. Recognition of Emotion and its Intensity from Speech Using Deep Learning - November 2022

M. Course Conduction:

Post Graduate: Neural Networks and Deep Learning, Soft Computing, Bio-inspired Computing Techniques and Bioinformatics.

Under Graduate: Machine Learning, Computer Networks, Digital System Design, Computer Architecture & Organization, Data Structure and Algorithms, and Software Development Projects.

N. Research Award:

- ✓ The Winner of the Best Paper Award Competition in ICECE 2022, Dhaka, Bangladesh.
- ✓ The Winner of the Best Paper Award Competition in MIET 2022, Noakhali, Bangladesh.
- ✓ The Winner of the Third Prize in the Best Paper Award Competition in EICT 2021, Khulna, Bangladesh.
- ✓ The Winner of the Second Prize in the Best Paper Award Competition in IJCCI 2019, Dhaka, Bangladesh.
- ✓ The Winner of the Second Prize in the Best Paper Award Competition in ICIET 2018, Dhaka, Bangladesh.
- ✓ The Winner of the Third Prize in the Best Paper Award Competition in ICCIT2015, Dhaka, Bangladesh.
- ✓ The Winner of the First Prize in the Best Paper Award Competition in SCIS&ISIS 2006, Japan.
- ✓ The Winner of the Sess. Best Presentation Awards in two sessions of SCIS&ISIS 2006, Japan.

O. International Research Collaboration: University and Researcher

- ✓ University of Ulster, UK – Dr. N. H. Siqqique
- ✓ Gunma University, Japan – Dr. M. A. S. Kamal
- ✓ Saitama University, Japan – Prof. Dr. T. Simamura
- ✓ International Professional University of Technology in Osaka, Japan – Prof. Dr. K. Murase
- ✓ Ohio State University, USA – Prof. Dr. H. Adeli
- ✓ King Faisal University, KSA – Dr. M. M. H. Rahman

P. Membership of Professional Bodies:

- ➢ Fellow (F/00313) of Bangladesh Computer Society (BCS)
- ➢ Senior Member (95047064) of Institute of Electrical and Electronics Engineers (IEEE)
- ➢ Life Member (M/23597) of Institute of Engineers Bangladesh (IEB)
- ➢ Senior Member (80339821) of International Association of Computer Science and Information Technology (IACSIT)
- ➢ ORCID ID https://orcid.org/0000-0001-5465-8519
- ➢ Scopus Author ID: 13805158600 https://www.scopus.com/authid/detail.uri?authorId=13805158600
- ➢ Google Scholar https://scholar.google.com/citations?user=NKBjhR8AAAAJ&hl=en

Q. Computer Proficiency:

Operating System	:	Windows, DOS & Linux
Languages	:	Visual C++ , Visual Basic &Visual FoxPro
Databases	:	Oracle, MS SQL Server, MySQL, FoxPro etc.
Applications	:	MATLAB, MS Office etc.
Networking	:	Experienced on Windows based networking

R. Personal Information:

Father's Name	:	Late Muhammad Abdul Kadir Akhand
Mother's Name	:	Late Rashida Khatun
Date of birth	:	April 30, 1976
Present Address	:	Flat 9B, Pacific Homes, 1-2 East Tejturi Bazar, Farmgate, Dhaka 1215
Permanent Address	:	Holding 358, Kakchar, PO+Upa-zilla: Nandail, Dist.: Mymensingh, Bangladesh
NID	:	506 436 1172 (Bangladeshi by birth)
Passport Number	:	A13627912
Religion	:	Islam
Marital Status	:	Married
Language Known	:	Bangali, English, and Japanese (little conversation)

Referees:

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August 17, 2024
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Date

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Signature
(*Dr. Muhammad Aminul Haque Akhand*)

Research and Publication of M. A. H. Akhand

Research Area:

Machine Learning, Deep Learning, Bio-Inspired Computing Techniques, Optimization, Pattern Recognition and Machine Translation

Specific Research Interest:

- ➢ Artificial Neural Networks (ANN) and Neural Networks Ensemble (NNE)
- ➢ Evolutionary Computation and Population based Methods
- ➢ Swarm Intelligence and other Bio-inspired Computing Techniques
- ➢ Bioinformatics and Computational Biology
- ➢ Real-life applications of optimization, sustainable engineering solution and health issues

Ongoing Researches:

- ➢ Early Autism Spectrum Detection using Deep Neural Networks (DNNs)
- ➢ Automatic Emotion Recognition from Facial Images, Blog Texts and other sources
- ➢ Highly Constrained Optimization (e.g., University Course Scheduling) using Bio-inspired Methods
- ➢ Transport Network Optimization and Traffic Flow Prediction

List of Publications
Book

3   **Muhammad Aminul Haque Akhand,** Deep Learning Fundamentals - A Practical Approach to Understanding Deep Learning Methods, ISBN: 978-984-35-0812-6, *University Grants Commission (UGC), Bangladesh, 2021.*
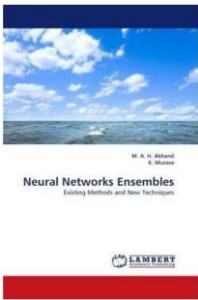
Short Description: Machine learning (ML) is the virtue of modern science and its outcomes are intelligent systems that became integral parts of daily lives. Artificial neural network (NN) is the most prominent ML method and deep learning (DL) is its latest form mimicking the learning mechanism of human brain. At present, DL is the most prominent research area and its different methods are employed in different research studies and development of significant systems. This book contains a comprehensive study of prominent DL methods from NN foundation. The book is written based on the experience of many years following pedagogical features with illustrations, step-by-step algorithms, worked examples and MATLAB code for real-world problems. This book might be a textbook for DL related courses in PG level of Computer Science, Engineering and related disciplines. This book will also be useful for young researchers to work with DL related methods.

News Report on Book: Samakal (June 29, 2021)

2   **M. A. H. Akhand,** Gene Regulatory Network Inference: Information Theoretic and Model Based Approaches, ISBN-10: 3330344059, ISBN-13: 978-3-330-34405-1 & EAN: 9783330344051, *LAP LAMBERT Academic Publishing, 2017.*

Short Description: Genes are the basic blue print of life in an organism and a set of genes that interact with each other to control a specific cell function is termed as Gene Regulatory Network (GRN). GRN inference is the reverse engineering approach to uncover the dynamic and intertwined nature of gene regulation in cellular systems analyzing gene expression. GRN inference is a computational intelligence task and a number of methods have been investigated those are categorized into two different approaches. In information theoretic approach, dependencies among genes are measured and then network is inferred employing individual inference

technique. In modelbased approach, parameter estimation of S-System model is a high dimensional optimization task. This book provides GRN inference basics and comprehensive study of major inference methods in both approaches. Several Swarm Intelligence methods are discussed and adapted to optimize S-System parameters. Prominent methods are evaluated on benchmark gene expression datasets and are compared on the basis of standard measures. The book will be helpful for basic knowledge and research foundation on GRN inference which is a promising field of research.

1   **M. A. H. Akhand**, and K. Murase, Neural Networks Ensembles: Existing Methods and New Techniques, ISBN-10: 3838391373 & ISBN-13: 978-3838391373, *LAP LAMBERT Academic Publishing*, 2010.

Short Description: Artificial neural network is designed with the goal of building intelligent machines to solve complex perceptual problems, such as pattern classification, by mimicking the networks of real neurons in the human brain. To achieve better performance over a single neural network, ensembles construction with several neural networks has become a nutritious filed of research. This book presents the basics of ensemble construction and discusses several existing ensemble methods. A large number of benchmark problems from different application domains were considered for evaluating the methods. After the discussion of the existing methods three new different techniques of ensemble constructions are explained in three different chapters. Last two chapters of this book are to discuss the new techniques on a common ground and draw the conclusions of this work together with the outline of future directions of research opened by this work.

Book Chapter

2   **M. A. H. Akhand**, M. M. Rahman, N., Siddique, "Advances on Particle Swarm Optimization in Solving Discrete Optimization Problems," In: Biswas, A., Kalayci, C.B., Mirjalili, S. (eds) *Advances in Swarm Intelligence. Studies in Computational Intelligence, Springer, Cham*. vol 1054, pp 59-88, 2023. DOI:10.1007/978-3-031-09835-2_4

1   Md. Monirul Islam, **M.A.H. Akhand**, and K. Murase, "A new algorithm to design neural networks ensemble," Dynamic Systems Approach for Embodiment and Sociality: From Ecological Psychology to Robotics, Editors: K. Murase and T. Asakura, *International Series on Advanced Intelligence*, vol. 6, pp.151-157, 2003.

International Journal

65   S. Das, S. A. Mumu, **M. A. H. Akhand**, and M. A. S. Kamal, "Epileptic Seizure Detection Using Integrated Decomposed Features from EEG Signals", *Journal of Computer Science*, vol. 20, no. 10, pp. 1270-1280, 2024. DOI: 10.3844/jcssp.2024.1270.1280 *Journal Indexing & Rating: **SJR – Q4, Scopus***

64   S. Das, S. A. Mumu, **M. A. H. Akhand**, A. Salam, and M.A.S. Kamal, "Epileptic Seizure Detection from Decomposed EEG Signal through 1D and 2D Feature Representation and Convolutional Neural Network" *Information*, vol. 15, no. 5, 256, 2024. DOI: 10.3390/info15050256 *Journal Indexing & Rating: **SJR – Q2, Web of Science IF: 2.4***

63   N. Tabassum, M.A.S. Kamal, M. A. H. Akhand and K. Yamada, "Cancer Classification from Gene Expression Using Ensemble Learning with an Influential Feature Selection Technique" *BioMedInformatics*, vol. 4, pp. 1275-1288, 2024. DOI: 10.3390/biomedinformatics4020070 *Journal Indexing & Rating: **Scopus***

62   A. C. Dhar, A. Roy, **M. A. H. Akhand**, M. A. S. Kamal, and K. Yamada "Cascaded Machine Learning Approach with Data Augmentation for Intrusion Detection System" *I. J. Computer Network and Information Security*, vol. 16, no. 4, pp. 17-30, 2024. DOI: 10.5815/ijcnis.2024.04.02 *Journal Indexing & Rating: **SJR – Q3, Scopus***

61 **M. A. H. Akhand**, M. A. Maria, M. A. S. Kamal and T. Shimamura, "Emotion Recognition from EEG Signal Enhancing Feature Map Using Partial Mutual Information", *Biomedical Signal Processing and Control*, vol. 88, 105691, 2024. DOI: 10.1016/j.bspc.2023.105691 *Journal Indexing & Rating: **SJR - Q1, Web of Science IF:4.9***

60 Md. Masum Billah, Md. Likhon Sarker and **M. A. H. Akhand** "KBES: A dataset for realistic Bangla speech emotion recognition with intensity level" *Data in Brief*, vol. 51, 109741, 2023. DOI: 10.1016/j.dib.2023.109741 *Journal Indexing & Rating: **SJR – Q3, Web of Science IF:1.0***

59 **M. A. H. Akhand**, M. A. Maria, M. A. S. Kamal and K. Murase "Improved EEG-based Emotion Recognition Through Information Enhancement In Connectivity Feature Map" *Scientific Reports*, *Nature*, vol. 13, Article Number 13804, 2023. DOI: 10.1038/s41598-023-40786-2 *Journal Indexing & Rating: **SJR - Q1, Web of Science IF:4.3***

58 M. A. Maria, **M. A. H. Akhand**, A. B. M. Aowlad Hossain, M. A. S. Kamal and K. Yamada "A Comparative Study on Prominent Connectivity Features for Emotion Recognition from EEG" *IEEE Access* , vol. 11, pp. 37809-37831, 2023. DOI: 10.1109/ACCESS.2023.3264845 *Journal Indexing & Rating: **SJR - Q1, Web of Science IF:3.476***

57 **M. A. H. Akhand**, Md. Rahat-Uz Zaman, Shadmaan Hye and M. A. S. Kamal, "Handwritten Numeral Recognition integrating Start-End Points Measure with Convolutional Neural Network", Electronics, vol. 12, no. 2, 472, 2023. DOI: 10.3390/electronics12020472 *Journal Indexing & Rating: **JCR - Q2, Web of Science IF:2.69***

56 M. A. Habib, **M. A. H. Akhand** and M. A. S. Kamal, "Emotion Recognition from Microblog Managing Emoticon with Text and Classifying using 1D CNN", *Journal of Computer Science*, vol. 18, no. 12, pp. 1170-1078, 2022. DOI: 10.3844/jcssp.2022.1170.1178 ***Journal Indexing & Rating: Scopus***

55 Z. J. Peya, S. M. Rahman and **M. A. H. Akhand**, "Autism Detection from Brain Signals: South Asia Perspective" *Journal of Engineering Science*, vol. 13, no. 2, pp. 69-81, 2022. DOI: 10.3329/jes.v13i2.63727

54 M. I. R. Shuvo, **M. A. H. Akhand** and N. Siddique, "Handwritten numeral recognition through superimposition onto printed form", *Journal of King Saud University - Computer and Information Sciences*, vol. 34, no. 9, pp 7751-7764, 2022. DOI: 10.1016/j.jksuci.2022.06.019 *Journal Indexing & Rating: **JCR - Q1, Web of Science IF:8.839***

53 Z. J. Peya, **M. A. H. Akhand**, J. F. Srabonee, and N. Siddique, "Autism Detection from 2D Transformed EEG Signal using Convolutional Neural Network", *Journal of Computer Science*, vol. 18, no. 8, pp. 695-704, 2022. DOI: 10.3844/jcssp.2022.695.704 *Journal Indexing & Rating: **Scopus***

52 M. R. Islam, **M. A. H. Akhand**, M. A. S. Kamal, and K. Yamada, "Recognition of Emotion with Intensity from Speech Signal Using 3D Transformed Feature and Deep Learning", Electronics, vol. 11, no. 15, 2362, 2022. DOI: 10.3390/electronics11152362 *Journal Indexing & Rating: **JCR - Q2, Web of Science IF:2.69***

51 A. S. B. Shahadat, **M. A. H. Akhand** and M. A. S. Kamal, "Visibility Adaptation in Ant Colony Optimization for Solving Traveling Salesman Problem," *Mathematics, MDPI*, vol. 10, no. 14, 2448, 2022. DOI:10.3390/math10142448 *Journal Indexing & Rating: **JCR - Q1, Web of Science IF:2.592***

50 Argha Chandra Dhar, Arna Roy, M. A. H. Akhand, and Md Abdus Samad Kamal, "Bangla↔English Machine Translation Using Attention-based Multi-Headed Transformer Model" *Journal of Computer Science*, vol. 17, no. 10, pp. 1000-1010, 2021. DOI: 10.3844/jcssp.2021.1000.1010 ***Journal Indexing & Rating: Scopus***

49 M. A. H. Akhand, Arna Roy, Argha Chandra Dhar and Md Abdus Samad Kamal, "Recent Progress, Emerging Techniques, and Future Research Prospects of Bangla Machine Translation: A Systematic Review" International Journal of Advanced Computer Science and Applications

(IJACSA), vol. 12, no. 9, pp. 291-307, 2021. DOI: 10.14569/IJACSA.2021.0120933 *Journal Indexing & Rating: Web of Science, Scopus.*

48 Arna Roy, Argha Chandra Dhar, **M. A. H. Akhand** and M. A. S. Kamal, "Bangla-English Neural Machine Translation with Bidirectional Long Short-Term Memory and Back Translation" *International Journal of Computer Vision & Signal Processing (IJCVSP), vol. 11, no. 1, pp. 25-31, 2021.*

47 **M. A. H. Akhand**, M. A. Habib, M. A. S. Kamal and N. Siddique, "Physarum-Inspired Bicycle Lane Network Design in a Congested Megacity" *Applied Sciences, MDPI, vol. 11, no. 15: 6958, 2021.* DOI:10.3390/app11156958 *Journal Indexing & Rating: Web of Science (Thomson Reuters, IF:2.679).*

46 Juyana Islam, **M. A. H. Akhand**, Md. Ahsan Habib, M. A. S. Kamal, N. Siddique "Recognition of Emotion from Emoticon with Text in Microblog Using LSTM," *Advances in Science, Technology and Engineering Systems Journal (ASTESJ), vol. 6, no. 3, pp. 347-354, 2021.* DOI: 10.25046/aj060340.

45 **M. A. H. Akhand**, Shuvendu Roy, N. Siddique, M. A. S. Kamal and T. Shimamura, "Facial Emotion Recognition Using Transfer Learning in the Deep CNN," *Electronics, MDPI, vol. 10, no. 9: 1036, 2021.* DOI: 10.3390/electronics10091036 *Journal Indexing & Rating: Web of Science (Thomson Reuters, IF:2.412).*

44 Asif Anjum Akash, **M. A. H. Akhand** and N. Siddique, "Robust Face Detection integrating Novel Skin Color Matching under Variant Illumination Conditions," *I.J. Image, Graphics and Signal Processing (IJIGSP), vol. 13, no.2, pp. 1-15, 2021.* DOI: 10.5815/ijigsp.2021.02.01

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2	Pattern Recognition with Deep Learning	3		19, 21, 24, 29, 32, 35, 36, 39, 45, 46, 48, 49, 50, 54, 56, 57	28, 32, 37, 43, 53, 55, 57, 59, 61, 63, 64, 70, 71, 72, 73, 74, 79, 80, 84, 85, 89	38 (1 + 0 + 16 + 21)
3	Biomedical Signal Processing and Control			55, 53, 52, 58, 61, 64, 65	49, 66, 69, 76, 77, 82, 86, 87, 88, 90, 91, 92	19 (0 + 0 + 7 + 12)
4	Optimization with Swarm Intelligence		2	16, 18, 20, 25, 28, 30, 33, 34, 37, 40, 42, 43, 47, 51	9, 10, 11, 12, 13, 14, 29, 31, 33, 35, 36, 38, 42, 46, 47, 52, 62, 65, 67, 75, 78, 81	37 (0 + 1 + 14 + 22)
5	Computation in Bioinformatics	2		23, 26, 27, 38, 41, 44, 60, 63	44, 45, 48, 50, 51, 58, 60	16 (1 + 0 + 8 + 7)
6	Others			9, 15, 17, 22, 31	18, 19, 21, 22, 25, 26, 27, 34, 40, 41, 54, 56, 68, 83	19 (0 + 0 + 5 + 14)

Total Publications: 162(3+2+65+92)

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