MD FASHIAR RAHMAN, PH.D.

Assistant Professor ◇ Dept. of Industrial, Manufacturing and Systems Engineering (IMSE)
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WORK EXPERIENCE (10+ YEARS)

University of Texas at El Paso, USA September 2022 - Present
Assistant Professor, Dept. of Industrial, Manufacturing and Systems Engineering (IMSE) and Computational Science Program (Affiliated)

· 40% research, 40% teaching, and 20% service

University of Texas at El Paso, USA September 2021 - August 2022
Assistant Professor of Research, Dept. of Industrial, Manufacturing and Systems Engineering (IMSE)

· Teach undergraduate and graduate classes/labs
· Writing grants proposal for external funding
· Conduct research and supervise students in Intelligent Systems Engineering Lab (ISEL)

University of Texas at El Paso, USA January 2017 - August 2021
Graduate RA/TA, Dept. of Industrial, Manufacturing, and System Engineering

· Teach undergraduate and graduate classes/labs, script grading
· Conduct research in ISEL and cooperate in proposal writing

Khulna University of Engineering & Technology, Bangladesh Dec 2014 - Dec 2016
Assistant Professor, Dept. of Industrial Engineering and Management

· Taught Industrial and systems engineering related courses to the undergraduate students.
· Supervised undergraduate students to accomplish their senior design project and thesis.

Khulna University of Engineering & Technology, Bangladesh July 2011 - Dec 2014
Lecturer, Dept. of Industrial Engineering and Management

· Taught Industrial and systems engineering related courses to the undergraduate students.

JUKI Singapore Pvt. Ltd., Bangladesh May 2011 - July 2011
Plant Engineer

· Floor layout planning and optimization, costing plan.

TEACHING EXPERIENCE (8+ YEARS)

Instructor (IE 5357), UTEP *Spring 2023, 2024*
Computer Simulation Applications

Instructor (IE 4353/IE/SE/MFG 5390), UTEP *Wintermester 2024*
Quality Engineering Boot Camp.

Instructor (IE 4353), UTEP *Fall 2023, 2022, 2024*
Industrial Systems Simulation.

Instructor (IE/SE/MFG 5358), UTEP *Spring 2023 2022, Fall 2022, 2024*
Industrial Data Analytics.

Independent Instructor (MFG 5311/SE 5347), UTEP *Spring 2020, 2021*
Design for Manufacturability/System Engineering Process.

Independent Instructor (IE 4395/5390 & MECH 4395/5390), UTEP *Summer 2020, 2021*
Green Energy Engineering.

Independent Instructor (MFG 5312), UTEP *Fall 2020, 2021*
Strategic Design of Manufacturing Systems.

Guest Lecture (IE 2377), UTEP *Fall 2019*
Electro-Mechanical System.

Guest Lecture (MFG 5359), UTEP *Fall 2017*
Computer-Aided Manufacturing.

Instructor of the following courses at KUET, Bangladesh *Fall 2012-2016*
Computer Fundamentals and Programming Language (*IPE 1209*), Probability and Statistical Analysis (*IPE 2207*), Statistical Quality Control (IPE 3221), Operations Research (*IPE 3205*), Material Handling & Maintenance Management, (*IPE 3223*), Production System Design (*IPE 3219*), and Computer Integrated Manufacturing (*IPE 4027*).

Instructor of the following courses at KUET, Bangladesh *Spring 2012-2016*
Data Structure and Algorithms (*CSE 2111*), Manufacturing Process -I (*IPE 1101*), Product Design (IPE 3105), Operations Management (*IPE 3119*), Management Information Systems (IPE 4107), Logistics in Supply Chain Management (*IPE 4129*), and Computer Aided Design (CAD) Lab (*IPE 3100*).

EDUCATION

The University of Texas at El Paso, USA *January 2017 - August 2021*
Ph.D. in Computational Science Program.

The University of Texas at El Paso, USA *January 2017 - December 2018*
MS in Computational Science Program.

Khulna University of Engineering & Technology, Bangladesh *February 2007 - May 2011*
BSc in Industrial & Production Engineering.

TEACHING AREA

Undergraduate Level
Computer Simulations; Machine Learning; Logistics & Supply Chain Management; Probability & Statistical Analysis; Statistical Quality Control; Operations Management; Operations Research; Computer fundamentals & Programming Language; Production System Design; Manufacturing process; Computer Integrated Manufacturing; Facilities Optimization; Lean Production Systems; System Engineering Process.

Graduate Level
Machine learning in Industrial/Transportation Applications; Industrial Data Analytic;; Smart Manufacturing Technologies; Stochastic Methods; Systems Modeling & Simulation; Cybersecurity in Manufacturing; Advanced Production Management; and Strategic Design of Manufacturing System.

RESEARCH INTEREST

Machine Learning/Deep Learning for industrial/Healthcare applications, Image Data mining, big data analysis.

Computer modeling, simulation, and optimization for large and complex systems.

In-situ process monitoring and prognostic analysis for Smart Manufacturing (SM) ecosystems.

RESEARCH EXPERIENCE

PhD Dissertation Title: *Artificial Intelligence based Quality Assessment of Composite Manufacturing Using Automated Visual Inspection System With SEM Images.*
My Ph.D. dissertation incorporates the image processing, machine learning, and computer vision techniques to leverage the automated quality inspection procedure. Automatic extraction of filler-morphology (size, orientation and spatial distribution) in Scanning Electron Microscopic (SEM) images is essential in composite manufacturing. In my dissertation, I developed a filler detection system (FDS) which can simultaneously classify, detect, and segment fillers in SEM images, making it suitable for morphology analysis of fillers and automatic quality inspection. This work can be extended for defect detection, localization, and segmentation for industrial applications.

MS Thesis Title: *Extraction of Fiber Morphology From SEM Images For Quality Control of Fiber Reinforced Composites Manufacturing.*
My MS thesis focused on automated Fiber Extraction from SEM Images with Application to Quality Control of Fiber-Reinforced Composites Manufacturing. Here, I Used the image data mining approach based on image processing techniques to segment the short fibers and extract different morphological information such as fiber orientation distribution, length distribution and homogeneity of fiber agglomeration.

B.Sc Thesis Title: *Analysis to achieve the Strategic fit of Supply Chain.*

PUBLICATIONS

Journals

1. Emon, Solayman Hossian, Bill Tseng, **Rahman, Md Fashiar Rahman** and others, *"Uncertainty-Guided Semi-Supervised (UGSS) Mean Teacher Framework for Brain Hemorrhage Segmentation and Volume Quantification"*, Biomedical Signal Processing and Control 102 (2025): 107386. https://doi.org/10.1016/j.bspc.2024.107386

2. **Rahman, Md Fashiar Rahman**, Bill Tseng, and others, *"Machine Learning Enabled Diagnostics With Improved Visualization of Diseases Lesion in Chest X-Ray Images"*, Diagnostics, 14(16), 1699 (2024). https://doi.org/10.3390/diagnostics14161699

3. Humayra, Afrin, Stephanie Vargas Esquivel, Raj Kumar, Md Ikhtiar Zahid, Beu Oporeza, **Md Fashiar Rahman**, Thomas Boland, and Md Nurunnabi, *"β-Glucan-Mediated Oral Codelivery of 5FU and Bcl2 siRNA Attenuates Stomach Cancer*", ACS Applied Materials & Interfaces 15, no. 27 (2023): 32188-32200.

4. Rahman, Md Habibur **Md Fashiar Rahman**, and Bill Tseng, *"Estimation of Fuel Consumption and Selection of the Most Carbon-Efficient Route for Cold-Chain Logistics"*, International Journal of Systems Science: Operations Logistics (2022). https://doi.org/10.1080/23302674.2022.2075043.

5. Wen, Yuxin, **Md Fashiar Rahamn**, Yan Zhuang, and others, *"Time-to-Event Modeling for Hospital Length of Stay Prediction for COVID-19 Patients"*, Machine Learning with Applications (2022): 100365: https://doi.org/10.1016/j.mlwa.2022.100365

6. Zhuang, Yan, **Md Fashiar Rahman**, Yuxin Wen, and others, *"An interpretable multi-task system for clinically applicable COVID-19 diagnosis using CXR"*, Journal of X-Ray Science and Technology (2022), doi:10.3233/XST-221151

7. **Rahman, Md Fashiar Rahman**, Yan Zhuang, Bill Tseng, and others, *"Improving Lung Region Segmentation Accuracy in Chest X-Ray Images Using a Two-Model Deep Learning Ensemble*

Approach", Journal of Visual Communication and Image Representation, (2022): 103521. doi: 10.1016/j.jvcir.2022.103521

8. **Rahman, Md Fashiar** , Bill Tseng, Jianguo Wu, Yuxin Wen, and Yirong Lin, *"Deep Learning-based Filler Detection and Segmentation in SEM Images for Automated Quality Inspection"*, Journal of Artificial Intelligence for Engineering Design, analysis and Manufacturing, 36, E15. doi:10.1017/S0890060421000330

9. **Rahman, Md Fashiar**, Jianguo Wu, and Bill Tseng, *"Automated Morphology Extraction of Fibers from SEM images for quality control of Fiber-Reinforced Composites Manufacturing"*, CIRP Journal of Manufacturing Science and Technology, volume No. 33, issn no. 1755-5817, pp: 176-157 (2021). doi:10.1016/j.cirpj.2021.03.010

10. Wen, Yuxin, **Md Fashiar Rahman**, Honglun Xu, and Bill Tseng, "Recent Advances and Trends of Predictive Maintenance from Data-driven Machine Prognostics Perspective." Measurement (2021): 110276. https://doi.org/10.1016/j.measurement.2021.110276

11. M. H. Ali, M. Rashedul, and **Md Fashiar Rahman**, *"Machine Utilization Technique for Job Shop Scheduling Using Tabu Search Algorithm"*, International Journal of Advance Industrial Engineering, 6(3) (2018)

12. **Rahman, Md Fashiar**, Md Bony Amin, and Mahmud Parvez, *"Application of AHP in Development of Multi-Criteria Ergonomic Approach for Choosing the Optimal Alternative for Material Handling-A Case Study and Software Development to Facilitate AHP Calculation"*, International Journal of Engineering 3.6 (2014).

Book Chapter

1. **Rahman, Md Fashiar**, Yuxin Wen, Honglun Xu, Bill Tseng and Aditya Akundi, *"Data mining in telemedicine"*, Advances in Telemedicine for Health Monitoring: Technologies, Design, and Applications, IET Publications, 2020.

Conferences

1. Avro, Sakib S, Rahman, SM Atikur, Tzu-liang (Bill) Tseng, and **Md Fashiar Rahman**. *"A Deep Learning Framework for Automated Defect Detection in Fused Filament Fabrication."*, Manufacturing Letters, 41, 1526-1534 (2024). https://doi.org/10.1016/j.mfglet.2024.09.179

2. Emon, Solayman Hossain, Tzu-Liang Bill Tseng, Michael Pokojovy, Peter McCaffrey, Scott Moen, and **Md Fashiar Rahman**. "Automatic hemorrhage segmentation in brain CT scans using curriculum-based semi-supervised learning." In Medical Imaging 2024: Image Processing, vol. 12926, pp. 644-650. SPIE, (2024). https://doi.org/10.1117/12.3006596

3. Sultana, Jakia, **Md Fashiar Rahman**, Christopher Colaw, and Tzu-liang Bill Tseng. "Empowering Quality Excellence: A 10-Day Quality Engineering Boot Camp for Accelerated Learning." In 2024 ASEE Annual Conference Exposition. 2024.

4. Chiou, Richard, Tzu-liang Bill Tseng, and **Md Fashiar Rahman**. "Virtual Reality Robotics with Internet-of-Things for Student Learning on Industrial Robotics and Automation in Manufacturing." In 2024 ASEE Annual Conference Exposition. 2024. https://peer.asee.org/48257

5. Chiou, Richard, Isher Singh, Arjuna Karthikeyan Senthilvel Kavitha, Tzu-liang Bill Tseng, **Md Fashiar Rahman**, and Nijanthan Vasudevan. "Virtual Reality Wind Turbine for Learning Green Energy Manufacturing." In 2024 ASEE Annual Conference Exposition. 2024. https://peer.asee.org/48258

6. Rahman, SM Atikur, **Md Fashiar Rahman**, Tamanna Kamal, and Tzu-Liang Bill Tseng. *"A Simulation-based Approach for Line Balancing Under Demand Uncertainty in Production Industry."* Winter Simulation Conference, 2023, San Antonio, TX. doi:10.1109/WSC60868.2023.10408105

7. **Rahman, Md Fashiar**, Briana Cardenas, Tzu-Liang Bill Tseng, and Honglun xu. *"A simulation-based optimization approach to improve the performance of the healthcare systems-A case study on the emergency department."* In IISE Annual Conference and Expo. IISE, 2023.

8. Akundi, Aditya, Immanuel Edinbarough, **Md Fashiar Rahman**, Amit J. Lopes, and Sergio Luna. *"Exploring Student Learning Experience of Systems Engineering Course Developed for Manufacturing and Industrial Engineering Graduates."* In 2023 ASEE Annual Conference Exposition. 2023.

9. Tseng, Tzu-liang, **Md Fashiar Rahman**, Aditya Akundi, and Richard Chiou. *"Exploring the Quality of Course Deployment in Engineering Education: A Quantitative Assessment using Quality Function Deployment."* In 2022 ASEE Annual Conference & Exposition. 2022.

10. Lopes, Amit, Ivan Renteria Marquez, **Md Fashiar Rahman**, Tzu-liang Tseng, and Sergio Luna. "Smart Manufacturing for Underserved Workforce Development." In 2022 ASEE Annual Conference & Exposition. 2022.

11. C. G. Rosales **Md Fashiar Rahman**, Honglun Xu, and Bill Tseng, *"Dimensional Accuracy Prediction for Shapte Memory Polymer Using Artificial Neural Network"*, 4th European Conference on IEOM Scoiety, Rome, Italy, August 2-5, 2021

12. **Rahman, Md Fashiar**, Tzu-Liang (Bill) Tseng, Michael Pokojovy, Wei Qian, and others, *"An automatic approach to lung region segmentation in chest x-ray images using adapted U-Net architecture,"* Medical Imaging 2021: Physics of Medical Imaging. Vol. 11595. International Society for Optics and Photonics, 2021.

13. Tseng, Bill, **Md Fashiar Rahman**, Richard Chiou, and Others, *"Sustainable Green Design and Life Cycle Assessment for Enginneiring Education"*, ASEE Annual Conference & Exposition (2021)

14. Tseng, Bill, **Md Fashiar Rahman**, Richard Chiou, and Others, *"Embedding Computer Simulation-based Classroom Activities to Enhance the Learning Experience for Manufacturing Systems"*, ASEE Annual Conference & Exposition (2020)

15. **Rahman, Md Fashiar**, Jianguo Wu, and Bill Tseng, *"Automated Fiber Extraction from SEM Images with Application to Quality Control of Fiber-Reinforced Composites"*, ASME 2018 13th International Manufacturing Science and Engineering Conference, ASME Digital Collection (2018).

16. Akundi, Aditya, Bill Tseng, **Md Fashiar Rahman** and Others, *"Non-Destructive Testing (NDT) and Evaluation Using Ultrasonic Testing Equipment to Enhance Workforce Skillset for Modern Manufacturing"*, ASEE Annual Conference & Exposition (2018)

17. **Rahman, Md Fashiar**, A.S.M.T. Hasan, M. R. Haque, *"Reduction of Bullwhip Effect of Supply Chain: A Systematic Approach"*, Proc. of 2nd Int. Conf. on Mechanical, Industrial and energy Engineering; Paper ID: MIE-12-040, ISBN 978-984-33-8081-4, Khulna, Bangladesh, February (2013).

18. Ahsan, A.M.M. Namul and **Md Fashiar Rahman**, *"A Supplier Selection Model Using Grey Relational Theory"*, Proceedings of the 7th Asian Business Research Conference 2012, Dhaka, Bangladesh, December (2012).

19. Rahman, Md Mahmudur, Md Ahasan Habib, **Md Fashiar Rahman**, and S. M. Rejwan-Al-Nahian. *"Achieving Strategic Fit of Supply Chain: A case Study Appraoch"*, Proceding of the Int. Conf. on Mechanical Engineering and Renewable Energy, Paper ID: ICMERE2011-PI-092, Chittagong, Bangladesh, December (2011)

TECHNICAL STRENGTHS

Expertise	Machine Learning, Deep Learning, Data Analytics
Computer Simulation	FlexSim and AnyLogic Simulation Software
Programming Language	Python, MATLAB, R, C/C++, SQL
Programming Libraries	Pandas, Keras, Tensorflow, OpenCV, Numpy, Scikit-Learn
Statistical Software	Minitab
3D Modeling and Design	AutoCad, SolidWorks, GaBi LCA, SIMIO

THEORETICAL STRENGTH

Intro to computational science; Mathematical and Computer Modelling; Advanced scientific computing; Numerical analysis; Computer vision; Data mining; Computer-aided manufacturing; Multivariate data analysis; Stochastic process; Statistics in research; Advanced Production Management; Modern Manufacturing Process; Computer Integrated Manufacturing Systems; Advanced Inventory Management; Statistical Quality Control.

FEDERAL/NON-FEDERAL GRANT AWARDS

DoEd-MSEIP	Co-PI	Empowering Underrepresented Minorities Through Applied Artificial Intelligence Education with Enhanced Access and Success in Engineering	2024-2027	**Funded $900,000**
Lockheed Martin	Co-PI	Developing an Evaluation System for Foreign Objective Detection (FOD)	2023-2024	**Funded $150,000**
DOE	Co-PI	A Smart Manufacturing Implementation and Workforce Development Framework for Underserved Small Medium Manufacturers	2023	**Funded $150,000**
DoEd-MSEIP	Co-PI	Enhancing Career Pathways in Intelligent Manufacturing Through Reo-mote Accelerated Center of Engineering Student Success (REMOTE-ACCESS)	2022-2025	**Funded $900,000**
NSF IUSE	Co-PI	Student Engagement and Training in Healthcare Engineering with Advanced Data Analytics Solutions	2022-2025	**Funded $300,000**
DoEd-MSP	Co-PI	Developing Modeling and Simulation-based Engineering Learning Environment for Capacity Transformation (M-SELECT) in Higher Education	2022-2024	**Funded $1,061,509**

PROJECTS

Project 1: Artificial Intelligence Based medical Diagnosis and Severity Analysis Using Chest X-Ray Images

- Developed a machine hybrid deep learning model to segment the lung region from CXR images
- The model can segment the lung region with an average Jccard Index and IoU of 96.3% and 92.7% respectively
- Working on to develop a noble machine learning model to identify the COVID-19 patient using CXR images and vital data and detect the affected region to leverage the severity analysis.

Project 2: Machine Learning Based Non-Destructive Testing and Evaluation (NDT/E) of Composite Manufacturing

- Developed a deep learning based fillers detection system using the Scanning Electronic Microscope (SEM) images
- The filler dection system can detect, classify and segment the fibers and particles in SEM images with an average of 97.8% accuracy

Project 3: Image Data Mining to Leverage the Fiber Morphology Extraction and Analysis for Composite Manufacturing

- Developed five image-processing based techniques for automatic extraction of fiber morphology.
- The method can extract morphological information such as fiber orientation and length distribution, and homogeneity of fiber agglomeration
- Developed a MATLAB Graphical User Interface (GUI) for real-time application of the methods. Available on: github.com/Fashiar/FiberMorphology

AWARD/SCHOLARSHIP

Outstanding Junior Faculty Award 2023 by American Society of Engineering Education (ASEE) Manufacturing Division.

Summer Faculty apprentice fellowship in 2023 with Lockheed Martin, Forth Worth, TX, USA.

Best track paper (as corresponding author), 2023 Manufacturing and Design (M&D) Division, IISE Annual Conference and Expo 2023, New Orleans, Louisiana.

Selected for UTEP graduate school summer research funding in 2021.

Received UTEP graduate school travel grant for SPIE medical imaging conference in 2020.

Received Texas Pubic Education Grant-International (TPEG-I) in 2018-2019 academic year.

Received NSF student award (travel grant) by ASME-MSEC in 2018.

Got the Anita Mochen Loya Fellowship at UTEP in 2017.

Best senior design project award in 2010, KUET, Bangladesh.

Achieved the best student award for academic excellence by Canada KUET Alumni in 2010.

Board scholarship for academic excellence in 2005, Jessore board, Bangladesh.

Board scholarship for academic excellence in 2003, Jessore board, Bangladesh.

PRESENTATION/TALKS

Oral presentation, American Society of Engineering Education (ASEE) annual conference - 2023 (Manufacturing Division) at Baltimore convention center, Maryland.

Invited speaker, IMSE-Day 2023 event on Artificial Intelligence (AI), The University of Texas El Paso, 2023

Guest speaker, Southwest Emerging Technology Symposium (SETS), The University of Texas El Paso, 2022

Virtual Oral Presentation, 4th European Conference on IEOM Society, Rome, Italy, 2021

Virtual Poster Presentation, SPIE medical imaging conference, 2021

Oral Presentation, 2018 ASME Manufacturing Science and Engineering Conferences, College Station, TX

Poster Presentation, IMSE Day, 2018, UTEP

Poster Presentation, IMSE Day, 2019, UTEP

Poster Presentation, 2017 CPS Alumni Day, UTEP

PROFESSIONAL SERVICES

Division Chair (2024-2025) for American Society of Engineering Education (ASEE) Manufacturing Division.

Program Chair (2023-2024) for American Society of Engineering Education (ASEE) Manufacturing Division.

Faculty Advisor of the Institute of Industrial and Systems Engineering (IISE) Student Chapter at UTEP.

Faculty Advisor of the Bangladesh Student Association (BSA) at UTEP.

Organizing Committee Member of IMSE Day Event 2021, 2023, and 2024 at UTEP.

Session Chair of 4th European Conference on IEOM Society, Rome, Italy, 2021.

Reviewer of IEOM Society 2021 Singapore Conference.

Member SPIE medical imaging society.

Reviewer of Journal of Intelligent Manufacturing (JIMS), Progress in Additive Manufacturing (PIAM), Applied soft Computing (ASOC), Computers in Biology and Medicine (CIBM), International Journal of Sustainable Transportation (IJST), and MDPI Journals.

Reviewer of different national and international conferences, such as IEEE RA-L, American Society of Engineering Education (ASEE), Institute of Industrial and Systems Engineering (IISE), and Industrial Engineering and Operation Management (IEOM) Society.

Faculty adviser - KUET Student Chapter of IEOM Society from 2015-2016.

Student adviser of Industrial Engineering and Management (IEM) Association at KUET, Bangladesh from 2013 to 2015.