PRAMITI SARKER, Ph.D., AEP

Profiles: Google Scholar ResearchGate LinkedIn

Visa Status: U.S. Permanent Resident

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PROFESSIONAL SUMMARY

Research	My research interest lies in the application of human factors & ergonomics, occupational safety, and biomechanics to optimize human performance, health, and systems. My research experience involves identifying and mitigating workplace hazards, reducing muscle fatigue and musculoskeletal disorders through analyzing human movement, and designing ergonomic interventions to optimize worker health and comfort.
Teaching	With four years of experience in teaching Industrial Engineering (Human Factors & Ergonomics). I have successfully instructed both theoretical and laboratory courses, as well as mentored 4th-year students on capstone projects. I have taught students human anatomy, biomechanics, anthropometry, rules of physical ergonomics and workplace settings. My teaching portfolio includes hands-on experience in large classrooms of 120-230 students and online settings. Noteworthy courses I have taught include: Work Analysis and Design I, Quality Management, Human Factors, Ergonomics, and Safety Management.

ACADEMIC POSITIONS

Aug 2023 – Present	**Assistant Professor (Visiting-Full Time)**, School of Industrial Engineering, Purdue University, West Lafayette, Indiana.
Sep 2020 – Jan 2021	**Graduate Intern**, Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota.
Aug 2019 – Dec 2019	**Graduate Teaching Assistant,** Department of Industrial and Manufacturing Systems Engineering, Iowa State University, Ames, Iowa.
Jan 2018 – Dec 2022	**Graduate Research Assistant,** Physical Ergonomics and Biomechanics Lab, Department of Industrial and Manufacturing Systems Engineering, Iowa State University, Ames, Iowa.
Sep 2015– Dec 2017	**Lecturer,** Department of Industrial and Production Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.

EDUCATION

December 2022 CGPA: 3.76	**Ph.D. in Industrial Engineering**, Department of Industrial and Manufacturing Systems Engineering, Ames, Iowa, USA
	Minor in Statistics
	• *Dissertation Title: Use of inventory control theory and multi-objective optimization to model work-rest scheduling*
	• *Committee Member:* Dr. Gary Mirka, Dr. Susan Hallbeck, Dr. Jason Gillette,

Dr. Jo K Min, Dr. Kris De Brabanter

December 2017 CGPA: 3.58	**M.S. in Industrial Engineering**, Department of Industrial and Production Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh.

- *Dissertation Title: Multidisciplinary Design Optimization of Injection Molding Systems under Uncertainty*

September 2015 CGPA: 3.87	**B.S. in Industrial Engineering**, Department of Industrial and Production Engineering, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

- *Dissertation Title: Probabilistic Method to Determine the Shortest Distance to Avoid Traffic*

AWARDS & CERTIFICATIONS

2024	• Approved for **Certified Professional Ergonomist** (CPE) examination by BCPE
2023	• **Associate Ergonomics Professional (AEP)** by BCPE
2021	• **Research Excellence Award** by Iowa State University, Ames, Iowa.
2012 – 2015	• **Dean's list scholarship,** Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
2011 – 2015	• **Technical scholarship**, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
2011 - 2015	• **University Merit Scholarship (3 out of 8 semesters for obtaining highest GPA in the class)** by Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

TEACHING EXPERIENCE

Aug 2023 – Present	**Assistant Professor (Visiting-Full Time)**, School of Industrial Engineering, Purdue University, West Lafayette, Indiana, USA

IE 38600 - Work Analysis and Design I (class size: 160-195 students)

- Served as a faculty to teach students the basics of Ergonomics, Human Anatomy, Biomechanics, Workplace Analysis, Environmental Safety, Time Study, Task analysis etc.
- Guided students in utilizing CATIA, RAMSIS, 3DSSPP etc. in Work Analysis and Design I laboratory study
- Prepared homework assignments and quizzes, questions, and organized make-up sessions
- Mentored two T.A.s and two graders under my supervision

IE 33000 - Probability and Statistics in Engineering II (Class size 120-190 students)

- Served as a faculty for two semesters to teach students the basics of Probability and Statistics and its role in engineering data analysis
- Guided students in utilizing R for data and statistical analysis
- Prepared homework assignments and quizzes, questions, and organized

make-up sessions
- Mentored two T.A.s and two graders under my supervision
- Fulfilled ABET accreditation criteria

IE 23000 –Probability and Statistics in Engineering I (class size: 230 students)

- Served as a faculty to teach students the basics of Probability and Statistics and its role in engineering data analysis
- Prepared homework assignments and quizzes, questions, and organized make-up sessions
- Mentored three T.A.s and two graders under my supervision

IE 34300 - Engineering Economy Analysis (class size: 145 students)

- Taught students basics of engineering economy, project evaluation, depreciation, inflation, income taxes etc.
- Designed and taught weekly 3-hour class with full responsibility.
- Mentored two T.A.s and two graders under my supervision.

Aug 2019 – Dec 2019   **Graduate Teaching Assistant**, Department of Industrial & Manufacturing Systems Engineering, Iowa State University, Ames, Iowa, USA

Classes: IE 3050- Engineering Economic Analysis (Class size 100 students)

- Lectured several classes and graded assignments, quizzes, and exams

Sep 2015- Dec 2017   **Lecturer**, Department of Industrial & Production Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

- Theoretical Courses Taught
  - IPE 301 || Measurement, Instrumentation and Control (Class size 180)
  - IPE 311 || Material Handling & Maintenance Management (Class size 30)
  - IPE 319 || Quality Management (Class size: 30 & 120)
  - IPE 303 || Product Design I (Class size 30)
  - IPE 407 || Ergonomics and Safety Management (Class size 30)
- Laboratory Courses Taught
  - IPE 302 || Measurement, Instrumentation Control Sessional
  - IPE 306 || Manufacturing Processes II Sessional
  - IPE 312 || Material Handling and Maintenance Management Sessional
  - IPE 402 || Machine Tools Sessional
  - IPE 470 || Industrial Simulation Sessional (ARENA)
  - IPE 408 || Ergonomics and Safety Management Sessional

PEER-REVIEWED JOURNAL PUBLICATIONS

Total Citations: 79, h-index: 4, and i-10: 4 (as of 10/27/2024, Profile link : [Google Scholar](#))

Published

2022
1. Hasan, N., Sarker, P. & Zaman, K., (2022). Multidisciplinary Robust and Reliability-Based Design Optimization of Injection Molding System. International Journal of Interactive Design and Manufacturing. 1-19.

2022
2. Norasi, H., Tetteh, E., **Sarker, P.**, Mirka, G. & Hallbeck, M., S., (2022). Exploring the Relationship between Neck Flexion and Neck Problems in Occupational Populations: A Systematic Review of the Literature. *Ergonomics*. 65 (4), 587-603.

2021
3. **Sarker, P.**, Norasi, H., Koenig J., Mirka, G. & Hallbeck, M.S., (2021). Effects of Break Scheduling Strategies on Subjective and Objective Measures of Neck and Shoulder Muscle Fatigue in Asymptomatic Adults Performing a Standing Task Requiring Static Neck Flexion. *Applied Ergonomics*. Volume 92, April 2021, 103311.

2020
4. **Sarker, P.,** & Mirka, G., (2020). The Effects of Repetitive Bouts of a Fatiguing Exertion (with Breaks) on the Slope of EMG Measures of Localized Muscle Fatigue. Journal of Electromyography and Kinesiology. V 51-p102382.

2020
5. Tetteh, E., **Sarker, P.**, Radley, C., Hallbeck, M. S. & Mirka, G., (2020). Effect of Surgical Radiation Personal Protective Equipment on EMG-based Measures of Back and Shoulder Fatigue: A laboratory Study on Novices: *Applied Ergonomics.*

Under-Review and In Preparation

2024
1. **Sarker, P.**, & Mirka, G., (2023). Use of Inventory Control Theory and Multi-Objective Optimization to Model Work-Rest Scheduling. Targeted Journal: *Theoretical Issues in Ergonomics Science.*

2024
2. Wang, J., Cao, Y., Roberts, F. Youssef, G., **Sarker, P.**, & Yu, D., (2024) Predicting Team Success: Analyzing Communication Patterns Through Quantitative Metrics. Targeted Journal: *Human Factors.*

2024
3. Santos, F.Z., Sudeesh, S., **Sarker, P.**, & Chowdhury, S. K. (2024). Influence of Firefighter Helmet Inertial Properties on Neck Muscle Fatigue. Targeted Journal: Journal of Biomechanics.

PEER-REVIEWED CONFERENCE POSTERS & PRESENTATIONS

2022	1. Tetteh, E., **Sarker, P**., Fales, C., Mettler, J., & Mirka, G. (2022). Inter-individual Variability in a Repetitive Lifting Task. *65th Proceedings of the Human Factors and Ergonomics Society Annual Meeting.*
2019	2. **Sarker, P**., & Mirka, G. (2019) Effects of Sampling Frequency and Sample Window Size on the Median Frequency of Surface EMG. *63rd Proceedings of the Human Factors and Ergonomics Society Annual Meeting.*

PROPOSAL WRITING EXPERIENCE

2024	1. Project Title: Proposal: The Extended Reality Frontier: Opportunities for Training and Assessing across Environments using Emerging Mixed Reality Technologies.
	Institution: Abhi Deshmukh Frontier Research, Purdue University.
	Role: Co-investigator
2024	2. Project Title: Exploring Intercultural Communication Competency in STEM Students: A Comparative Study at Purdue University.
	Institution: CILMAR Seed Grant, Purdue University.
	Role: Co-investigator

Mentorship and Industrial Internship Projects

Aug 2024 – Present	Project Title: *7-eleven Cold-Vault Space Optimization*
	Institutions: Purdue University, 7-Eleven Inc. Bruegmann, USA, Inc.
	Role: P.I. and Supervisor, mentored five undergraduate students in the capstone project
	Brief Description: The goal of this study is to determine the value of increasing the shelf depth as it relates to operational efficiencies e.g. restocking, cold vault holding capacity. The mission is to determine current pain points as it relates to vendor product deliveries, restocking and space constraints within the cold-vault, and analyze how increasing the shelf depth from 36" to 48" affects these pain points. The success metrics of this project are labor savings from restocking and vendor deliveries before vs. after increasing shelf depth, comparing holding capacity of cold vault before vs. after increasing shelf depth, reducing backstock footprint, analyzing staging and processes during vendor deliveries, increasing sales and ROI model by increasing shelf depth.
Jan 2024-Present	Project Title: *Fall Risk Index for Patients in Rehabilitation*
	Institutions: Purdue University, TIRR Memorial Herman Inc.
	Role: Co- Supervisor, mentored one graduate student.
	Brief Description: This project aims to develop a fall risk index for rehabilitation patients who survived traumatic brain injury. Supervised a graduate student in developing research questions and data analysis, conducting a literature review, and finding the scope of potential industrial engineering research opportunities.

Jan 2024 -May 2024

Project Title: *Pierce Aerospace Usability and Human Factors*

Institutions: Purdue University, Pierce Aerospace, Inc.

Role: P.I. and Supervisor, mentored five undergraduate students in capstone project

Brief Description: Conducted usability studies to analyze the current state of the human-machine interface, identified strengths and weaknesses based on user interactions, feedback, and various usage scenarios, and provided recommendations for interface improvements to address identified issues. Recommended iterative, user-centric design changes based on usability study findings, focused on optimizing the interface for efficiency, safety, and user satisfaction. Evaluated and recommended improvements to the ergonomic design of hardware, software, and user interface elements, assessing the impact of human factors on usability, efficiency, and safety during product interaction.

Sep 2020-Jan 2021

Project Title: *Optimizing between Muscle Fatigue and Performance of Laparoscopic Surgeons*

Institutions: Iowa State University, Mayo Clinic

Role: Principal-investigator

Brief Description: Collaborated with Mayo Clinic to optimize the performance of laparoscopic surgeons. Conducted pilot studies to develop experimental procedures. Designed a laboratory study to quantify physical demand associated with awkward postures in surgeons. Designed a laboratory study to quantify the performance of laparoscopic surgeons. Developed MATLAB code to analyze and process muscle fatigue data. Worked with surface electromyogram (sEMG) to collect data from the shoulder muscle of the subject. Applied knowledge of Operations Research to develop the model.

Jan 2019-Dec 2019

Project Title: *Fatigue Assessment of Farm Machinery Seating Systems*

Institutions: Iowa State University, John Deere.

Role: Co-investigator

Brief Description: Conducted usability studies to analyze the current state of the old sitting system and new sitting system of John Deere tractor machine. Collected muscle fatigue, heart rate variability and human performance data, collected strengths and weaknesses based on user interactions and provided feedback, provided experimental procedure for in field data collection.

PROFESSIONAL SERVICE EXPERIENCE

Institutional Services

- Attended multiple faculty meetings and participated in table discussion and report preparation, as well as contributed to the course development process in the Department of Industrial Engineering at Purdue University

- Mentored doctoral student in research writing and proposal submission at Purdue University

- Mentored two undergraduate research assistants in research work and developed projects for undergraduate research at Iowa State University

Reviewer

- Served as NSF panel reviewer

PROFESSIONAL AFFILIATIONS

2018-Present	Member of Human Factors and Ergonomics Society

INDUSTRIAL EXPERIENCE

May 2014- Aug 2014	**Engineering Intern,** Akij Food and Beverage Ltd., Dhaka, Bangladesh.

- Performed root cause analysis of extensive packaging cost (FMEA)
- Identified user-related risk analysis, redesigned packaging machine, and reduced production loss by 11%
- Developed layout and conducted a time-motion study of the workers

SKILLS

Experimental	• Motion capture system (Vicon & Qualisys), electromyography (Delsys and Noraxon Inc), force platform (Kistler), dynamometer, driving simulator, Surface Electromyogram (sEMG), Lumbar Motion Monitor (LMM), Inertial Measurement Units (IMU)
Modeling	• Musculoskeletal modeling Open Sim, Jack-Siemens PLM software, 3DSSPP, SolidWorks, CATIA, and AutoCAD
Computer	• MATLAB, LabVIEW, Python, C++,
Statistical Analysis	• Statistical Analysis Software (SAS), Minitab, SPSS, R, JMP
Languages	• English (fluently spoken and written), Bengali (heritage speaker)

SELECTED GRADUATE COURSES

Human-Systems, Health, and Safety

- Musculoskeletal Biomechanics
- Occupational Biomechanics
- Human Factors
- Musculoskeletal Biomechanics
- Ergonomics and Safety Management
- Research Practicum in Human Factors & Ergonomics
- Quantitative Human Movement

Operations Research and Manufacturing Systems

- Design of Experiment
- Statistical Methods for Researchers
- Multivariate Statistical Methods
- Statistical Theory for Research Works
- Logistic Management
- Probabilistic Methods for Engineering Design
- Production System Analysis

RESEARCH INTERESTS

- Biomechanical aspects in virtual or/and augmented reality training
- Digital human modeling
- Work physiology and muscle fatigue
- Musculoskeletal health and mitigation
- Robotics, prosthetic, assistive, and wearable devices
- Musculoskeletal rehabilitation
- Optimizing Human Performance, System and Health

TEACHING INTERESTS

- Probability and Statistics in Engineering
- Human Factors and Ergonomics
- Occupational Safety and Health
- Engineering Economy
- Manufacturing Processes
- Operation Research
- Quality Management