

MD ABUL BASHAR EMON

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EDUCATION

Ph. D.	Theoretical & Applied Mechanics, University of Illinois at Urbana-Champaign	2023
M. Sc.	Civil & Structural Engineering, Bangladesh University of Engineering & Technology	2014
B. Sc.	Civil Engineering, Bangladesh University of Engineering & Technology	2012

ACADEMIC POSITIONS

Laboratory Coordinator	Mechanical Testing Instructional Laboratory, Grainger College of Engineering, University of Illinois at Urbana-Champaign	2025-present
Postdoctoral Research Associate	Mechanical Science & Engineering, University of Illinois at Urbana-Champaign	2023-2025
Graduate Research Assistant	Mechanical Science & Engineering, University of Illinois at Urbana-Champaign	2017-2023
Assistant Professor	Civil Engineering, Bangladesh University of Engineering & Technology	2015-2017
Lecturer	Civil Engineering, Bangladesh University of Engineering & Technology	2012-2015

AWARDS/HONORS

▪ Best Thesis Award , Mechanical Science & Engineering, UIUC	2023
▪ Beckman Institute Graduate Fellowship Awarded through campus-wide competition for interdisciplinary research	2021-2022
▪ Cancer Center at Illinois (CCIL) Graduate Scholarship The scholarship funds students to pursue cancer research	2021
▪ Michael A. and E. Ann Sutton Graduate Student Award Student award for contribution in Theoretical and Applied Mechanics	2021, 2023
▪ MAVIS Future Faculty Fellowship (MF3) By the Grainger College of Engineering for transition into academia	2020-2021
▪ NIH T32 Scholarship Most prestigious T32 grant from the National Institutes of Health	2018-2020
▪ Tau Beta Pi Outstanding Graduate Student	2019
▪ MechSE Graduate Student Fellowship, Spring	2017
▪ Prime Minister's Gold Medal For securing the highest CGPA in the faculty of Civil Engineering, BUET	2012
▪ Mitsubishi Corporation International Scholarship	2012
▪ Dean's Scholarship	2007-2011
▪ University Merit Scholarship	2008-2012

RESEARCH INTEREST

Mechanics of cancer metastasis, Micro-electro-mechanical systems (MEMS), Emergent biohybrid systems, Mechanobiology, Biomaterials, Solid Mechanics, Stimulated Raman Spectroscopy (SRS) imaging in cancer, Nanomaterials etc.

TEACHING INTEREST

Biomechanics, Tissue engineering, Biofabrication, Solid mechanics, Statics, Dynamics, Elasticity, Plasticity, Continuum mechanics, Biopolymers, Micro-electro-mechanical systems (MEMS), Modeling of biological systems, Biohybrid machines, Mathematical methods, Finite element methods, Engineering structures

TEACHING EXPERIENCE:

I taught the following undergraduate courses as a Lecturer (2012-2015) and Assistant Professor (2015-2017) at Bangladesh University of Engineering & Technology.

- Mechanics of solids I & II
- Engineering materials
- Numerical methods
- Finite Element Methods
- Design of concrete structures
- Dynamics of structures
- Computer Aided Design

OUTREACH & SERVICE

- **Review Editor:** Frontiers in cell and developmental biology, 2023
- **Member:** Beckman Institute Executive Committee, 2022-23
- **Mentor:** Eight undergraduate students and three high school students
- **Volunteer:** Engineering/Beckman Open House, SES Annual meeting, Judge-Undergraduate Research Symposium at Illinois
- **Co-convener:** CCIL Tissue Microenvironment (TiMe) Symposium, 2021

PUBLICATIONS

JOURNAL PAPERS:

- **MAB Emon**, A Kashefi, MH Rahman, D Adnan, N Ospina-Munoz, SM Mellican, S Santiago, WC Drennan, MSH Joy, AA Phan, T Afrin, LS Santovito, B Han, KC Smith, F Bishehsari, MTA Saif, "Biomechanical 3D tumor models on a micro-milled high-throughput force sensor array", *Biofabrication*, 18, 025015, 2026
- **MAB Emon**, MSH Joy, WC Drennan, MTA Saif, "A multi-functional sensor for cell traction force, matrix remodeling and biomechanical assays in self-assembled 3D tissues in vitro", *Nature Protocols*, 20, 2005–2033, 2025
- MG Tetrick, **MAB Emon**, U Doha, M Marcellus, J Symanski, V Ramanathan, MTA Saif, CJ Murphy, "Decoupling chemical and mechanical signaling in colorectal cancer cell migration", *Scientific Reports*, 15, 4952, 2025.
- WC Drennan, O Aydin, **MAB Emon**, Z Li, MSH Joy, A Barishman, Y Kim, M Wei, D Denham, A Carrillo, MTA Saif, "A forward-engineered, muscle-driven soft robotic swimmer", *Science Advances*, 11, eadu8634, 2025.

- **MAB Emon**, MSH Joy, L Lalonde, A Ghayeb, U Doha, L Ladehoff, R Brockstein, C Saengow, RH Ewoldt, MTA Saif, "Nuclear deformation regulates YAP dynamics in cancer associated fibroblasts", *Acta Biomaterialia*, 173, 93-108, 2024.
- **MAB Emon** & MTA Saif, "A window into solid stresses within tumours", *Nature Biomedical Engineering*, 7, 1348–1349, 2023.
- **MAB Emon***, YJ Song*, MV Kovour, KV Prasanth, MTA Saif, "Mechanosensitive changes in the expression of cancer-associated genes in colorectal cancer-associated fibroblasts", *Scientific Data*, 10 (350), 2023.
- MSH Joy, DL Nall, **MAB Emon**, KY Lee, A Barishman, M Ahmed, S Rahman, PR Selvin, MTA Saif, "Synapses without tension fail to fire in an in vitro network of hippocampal neurons.", *PNAS*, 120 (52) e2311995120, 2023.
- Q Yang, TL Liu, Y Xue, H Wang, Y Xu, **MAB Emon**, ..., JA Rogers, "Eco/bioresorbable forms of micro-electromechanical systems", *Nature Electronics*, 5, 526–538, 2022
- **MAB Emon**, Z Li, MSH Joy, U Doha, F Kosari, MTA Saif, "A novel method for sensor-based quantification of single/multi-cellular traction dynamics and remodeling in 3D matrices", *Science Advances*, 7 (15), eabf2629, 2021
- **MAB Emon**, S Knoll, U Doha, L Ladehoff, L Lalonde, D Baietto, M Sivaguru, R Bhargava, MTA Saif, "Dose-independent threshold illumination for non-invasive time-lapse fluorescence imaging of live cells", *Extreme Mechanics Letters*, 46, 10124, 2021
- U Doha, O Aydin, MSH Joy, **MAB Emon**, W Drennan, MTA Saif, "Disorder to order transition in cell-ECM systems mediated by cell-cell collective interactions", *Acta Biomaterialia*, 2022
- Z Li, A Tofangchi, RA Stavins, **MAB Emon**, RD McKinney, PJ Grippo, MTA Saif, "A portable pen-sized instrumentation to measure stiffness of soft tissues in vivo", *Scientific reports*, 11 (1), 1-11, 2021
- O Aydin*, **MAB Emon***, S Cheng, L Hong, LP Chamorro, MTA Saif, "Performance of fabrics for home-made masks against the spread of COVID-19 through droplets: A quantitative mechanistic study", *Extreme Mechanics Letters*, 40, 100924, 2020; *equal contribution authors
- J Bauer, **MAB Emon**, JJ Staudacher, AL Thomas, JZ Spitzenberg, G Mancinelli, N Krett, MTA Saif & B Jung, "Increased stiffness of the tumor microenvironment in colon cancer stimulates cancer associated fibroblast-mediated prometastatic activin A signaling", *Scientific Reports*, 10 (50), 2020
- M Elhebeary, **MAB Emon**, O Aydin, MTA Saif, "A novel technique for in situ uniaxial tests of self-assembled soft biomaterials", *Lab on a Chip*, 19 (7), 1153-1161, 2019
- **MAB Emon**, J Bauer, Y Jain, B Jung, MTA Saif, "Biophysics of Tumor Microenvironment and cancer metastasis - a mini review", *Computational & Structural Biotechnology Journal*, 16, 279–287, 2018
- JK Chang*, **MAB Emon***, CS Li, Q Yang, HP Chang, Z Yang, CI Wu, MTA Saif, JA Rogers, "Cytotoxicity and in Vitro Degradation Kinetics of Foundry-Compatible Semiconductor Nanomembranes and Electronic Microcomponents", *ACS Nano*, 12 (10), 9721-9732, 2018; * equal contribution authors
- **MAB Emon**, T Manzur, N Yazdani, "Improving performance of light weight concrete with brick chips using low-cost steel wire fiber", *Construction and Building Materials*, 106, 575-583, 2016
- **MAB Emon**, T Manzur, MS Sharif, "Suitability of locally manufactured galvanized iron (GI) wire fiber as reinforcing fiber in brick chip concrete", *Case studies in construction materials*, 7, 217-227, 2017

- T Manzur, N Yazdani, **MAB Emon**, “Potential of carbon nanotube reinforced cement composites as concrete repair material”, *Journal of Nanomaterials*, 2016, 2
- T Manzur, N Yazdani, **MAB Emon**, “Effect of Carbon Nanotube Size on Compressive Strengths of Nanotube Reinforced Cementitious Composites”, *Journal of Materials*, Hindawi Publishing Corporation, 2014
- T Manzur, **MAB Emon**, K Islam, “Nanotechnology: The Emerging Field of Civil Engineering Particularly in Developing Countries”, *Advanced Materials Research*, 974, 329-334, 2014
- S Iffat, **AB Emon**, T Manzur, SI Ahmad, “An Experiment on Durability Test (RCPT) of Concrete According to ASTM Standard Method Using Low-Cost Equipments”, *Advanced Materials Research*, 974, 335-340, 2014

CONFERENCE PAPERS:

- MM Sifat, S Bhowmik and **MAB Emon**, “Effect of Wind Loads on Lateral Deflection and Drift Behavior of Shear Wall-Frame Structures”, under review for *Advances in Civil Infrastructure and Construction Materials*, CICM, MIST, Dhaka, Bangladesh, December 2015
- MS Khan, **MAB Emon** & T Manzur, “Effect of Aspect Ratio on Column Strengthening Using FRP Laminates”, 2nd International Conference on Advances In Civil Engineering (ICACE), CUET, Chittagong, Bangladesh, December, 2014
- **MAB Emon**, T Manzur, “Toughness Indices and Residual Strength Factors of Locally Available Steel Wire Reinforced Concrete”, UKIERI Concrete Congress, Jalandhar, Punjab, India, November, 2015
- MM Sifat, F Khaled, **MAB Emon**, S Iffat, “Lateral Deflection of Shear-Wall Frame Structure: A Parametric Study with Component Stiffness Method and Finite Element Method”, UKIERI Concrete Congress, Jalandhar, Punjab, India, November, 2015

THESES:

- **Md. Abul Bashir Emon** (2012), “An Analytical and Computational Investigation On Lateral Stiffness Of Shear Walls With Openings”, B. Sc. Engg (Civil) Thesis, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
- **Md. Abul Bashir Emon** (2014), “Study of Strength and Ductility of Galvanised Iron Wire Reinforced Concrete”, M. Sc. Engg (Civil & Structure) Thesis, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
- **Md. Abul Bashir Emon** (2023), “Towards Understanding the Role of Cellular Force in Cancer Progression”, Ph. D. in Theoretical & Applied Mechanics, University of Illinois at Urbana-Champaign, Illinois, USA.

TALKS/PRESENTATIONS:

- Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization–I, American Society of Mechanical Engineers (ASME) IMECE, Columbus, OH, Oct 30-Nov 3, 2022
- Biomaterials and Tissue: Modelling, Synthesis, Fabrication and Characterization–II, American Society of Mechanical Engineers (ASME) IMECE, Columbus, OH, Oct 30-Nov 3, 2022
- Mechanobiology of Disease, Society of Engineering Science (SES) Annual Technical Meeting, Texas A&M, College Station, TX, October 16-19, 2022

- Mechanics of Complex Networks in Materials and Biology, Society of Engineering Science (SES) Annual Technical Meeting, Texas A&M, College Station, TX, October 16-19, 2022
- Cancer Technologies, Biomedical Engineering Society (BMES) Annual Meeting in San Antonio, TX, October 12-15, 2022
- Mechanobiology Of Cancer Summer School, Prullans, Barcelona, Spain, September 27-30, 2022
- Midwest Tumor Microenvironment Meeting at the University of Kansas Medical Center, Kansas City, KS, May 23-25, 2022
- Carl R. Woese Institute for Genomic Biology (IGB) Fellows Symposium, May 5, 2022
- Midwest Tumor Microenvironment Meeting at the University of Notre Dame, IN, May 20-22, 2019
- Biomedical Engineering Society (BMES) Annual Meeting in Philadelphia, PA, October 16-19, 2019

CONFERENCE AWARDS:

- National Academy of Sciences Travel Grant, Cancer Engineering Workshop, Washington DC, 2025
- NSF Travel Award, 8th Midwest TME Meeting, Purdue University, West Lafayette, IN, 2023
- NSF Travel grant, Society of Engineering Science, Texas A&M, TX, 2022
- Young Investigator Award (posterblitz), 7th Midwest TME Meeting, KUMC, KS, 2022
- Winner- Poster competition IGB symposium, 2022
- Young Investigator Award, 6th Midwest TME Meeting, Notre Dame, IN, 2019

WEBSITES/MEDIA MENTIONS:

- [Illinois Students Earn CCIL Scholarships to Support Cancer Research](#)
Recognized by the Cancer Center at Illinois for cancer-focused research excellence.
- [Bashar Wins Michael A. and E. Ann Sutton Graduate Student Award](#)
Awarded for outstanding doctoral research in Theoretical and Applied Mechanics.
- [Emon Awarded Prestigious Beckman Fellowship](#)
Granted two-year's funding for interdisciplinary research on cancer.
- [Seven Students Win 2021 Beckman Institute Graduate Fellowships](#)
Selected as a Beckman Graduate Fellow to support interdisciplinary research.
- [Emon named a Mavis Fellow](#)
Selected to receive training and mentorship for pursuing a faculty career.
- [MechSE's 2021 student award winners](#)
Received Michael and Ann Sutton Award as an outstanding graduate student in Theoretical and Applied Mechanics
- [Making a Homemade COVID Mask: Study Explains Best Fabric Choices](#)
Featured by the Graduate College for research on protective fabric performance.
- [Bashar Named T32 Scholar by the Cancer Center at Illinois](#)
Awarded the NIH T32 TiMe training fellowship for cancer microenvironment research.
- [Saif Lab Identifies T-Shirts as Potential Mask Material](#)
Collaborated on experimental validation of common fabrics for public health.
- [Material for COVID-19 Mask: This Common Item is Surprisingly Effective](#)
Science communication feature highlighting findings from collaborative research.
- [Scientists Test Best Fabric Choices for Making a Homemade COVID Mask](#)
Contributed to a study that evaluated effectiveness of fabric for DIY masks.