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

Postdoctoral Research Associate	Mechanical Science & Engineering, University of Illinois at Urbana-Champaign	2023-present
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** — 2021-2022
  Awarded through campus-wide competition for interdisciplinary research
- **Cancer Center at Illinois (CCIL) Graduate Scholarship** — 2021
  The scholarship funds students to pursue cancer research
- **Michael A. and E. Ann Sutton Graduate Student Award** — 2021, 2023
  Student award for contribution in Theoretical and Applied Mechanics
- **MAVIS Future Faculty Fellowship (MF3)** — 2020-2021
  By the Grainger College of Engineering for transition into academia
- **NIH T32 Scholarship** — 2018-2020
  Most prestigious T32 grant from the National Institutes of Health
- **Tau Beta Pi Outstanding Graduate Student** — 2019
- **MechSE Graduate Student Fellowship, Spring** — 2017
- **Prime Minister's Gold Medal** — 2012
  For securing the highest CGPA in the faculty of Civil Engineering, BUET
- **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**, 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, in press*
- **MAB Emon**, MSH Joy, L Lalonde, A Ghrayeb, 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 Bashar 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 Bashar 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 Bashar 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:

- 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:

- Google Scholar: https://scholar.google.com/citations?user=-uHpmLYAAAAJ&hl=en
- Researchgate: https://www.researchgate.net/profile/Md_Abul_Bashar_Emon
- https://cancer.illinois.edu/illinois-students-earn-ccil-scholarships-to-support-cancer-research/
- https://mechse.illinois.edu/news/33958
- https://mechse.illinois.edu/news/35399
- https://beckman.illinois.edu/about/news/article/2021/04/28/seven-students-win-2021-beckman-institute-graduate-fellowships
- https://scitechdaily.com/scientists-test-best-fabric-choices-for-making-a-homemade-covid-mask/
- https://grad.illinois.edu/news/making-homemade-covid-mask-study-explains-best-fabric-choices
- https://mechanical.illinois.edu/news/bashar-named-t32-scholar-cancer-center-illinois
- http://cancer.illinois.edu/educational-programs/graduate/time-program/time-cohorts
- https://mechanical.illinois.edu/news/saif-team-identifies-t-shirts-potential-mask-material
- https://www.spring.org.uk/2020/05/material-covid-19-mask.php