Md Sadman Faruque

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Google Scholar

SUMMARY

Researcher in computational mechanics driven by a passion for developing novel computational methods and solving real-world engineering problems using such methods.

RESEARCH INTERESTS

Computational Mechanics; Structural Analysis; Isogeometric Analysis (IGA); Seamless Integration of Computer-Aided-Design (CAD) and Finite Element Analysis (FEA); Splines with Extraordinary Points; Crash Simulations;

EDUCATION

Ph.D. in Mechanical Sciences and Engineering Sept 2021 - Current
University of Michigan-Dearborn, USA

Thesis: "Toward seamless integration of CAD and FEA using smooth splines."

Advisor: Dr. Hugo Casquero.

CGPA: 3.97/4.00.

Master of Science in Mechanical Engineering Sept 2021 - April 2023
University of Michigan-Dearborn, USA

CGPA: 3.94/4.00 (Graduated with High Distinction).

B.Sc. in Mechanical Engineering Feb 2016 - Jan 2020
Military Institute of Science and Technology, Dhaka, Bangladesh

CGPA: 3.53/4.00.

PROFESSIONAL EXPERIENCE

Graduate Student Research Assistant Sept 2021 - Current
Mechanical Engineering Department, University of Michigan-Dearborn, USA

Supported by (1) the National Science Foundation (NSF), USA, (2) Honda Motor Co., Japan, (3) Ford Motor Co., USA, and (4) Ansys Inc., USA.

Advisor: Dr. Hugo Casquero.

Graduate Student Instructor Sept 2021 - Dec 2024
Mechanical Engineering Department, University of Michigan-Dearborn, USA

Computational Thermo-Fluids (ME 525/4301): Lab instructor and coursework grader. Fall 2021. Fall 2024.

Trainee Engineer Dec 2018 - Jan 2019
Square Pharmaceuticals Ltd., Dhaka, Bangladesh

Hands-on training in Heating, Ventilation, and Air Conditioning (HVAC) systems.

PUBLICATIONS

- **M. S. Faruque**, Z. Wen, X. Wei, H. Casquero, "Spectrum analysis of C^0, C^1, and G^1 constructions for extraordinary points", *Engineering with Computers*, 2024.
- **M. S. Faruque**, H. Casquero, "Locking-free isogeometric discretizations of linear plane Timoshenko rods: LAS elements", *Computer Methods in Applied Mechanics and Engineering*, 2024, 425, 116918.
- Z. Wen, **M. S. Faruque**, X. Li, X. Wei, H. Casquero, "Isogeometric analysis using Gspline surfaces with arbitrary unstructured quadrilateral layout", *Computer Methods in Applied Mechanics and Engineering*, 2023, 408, 115965.
- M. A. Rahman, M. B. Tamam, **M. S. Faruque**, A. K. M. M. Morshed, "Study of mini channel heat sink with different internal configuration", *MATEC Web of Conferences*, 319, 02004.

RESEARCH PROJECTS

- **M. S. Faruque**, K. D. Mathews, "Computationally-efficient quadratic spline discretizations for Reissner-Mindlin shells and solids", *Honda Motor Co.*, June 2024 - March 2025, PI: H. Casquero.
- **M. S. Faruque**, K. D. Mathews, "Benchmarking of splines with extraordinary points for crash simulations", *Ford Motor Co.*, June 2022 - May 2024, PI: H. Casquero.
- **M. S. Faruque**, K. D. Mathews, "Enhancement of IGA BEXT modeling method", *Honda Motor Co.*, Oct 2023 - March 2024, PI: H. Casquero.
- M. Golestanian, **M. S. Faruque**, "Crashworthiness simulations using thin-walled solid BEXT meshes", *Honda Motor Co.*, July 2022 - March 2023, PI: H. Casquero.
- M. Golestanian, **M. S. Faruque**, "Development of seamless integration between design and simulation", *Honda Motor Co.*, Sept 2021 - March 2022, PI: H. Casquero.

CONFERENCES

- (20-min Invited talk) **M. S. Faruque**, H. Casquero, "A comparative study of assumed-strain locking treatments for NURBS-based discretizations of rods", *12th International Conference on IsoGeometric Analysis*, St. Augustine, Florida (USA), Oct 27-30, 2024.
- (20-min Invited talk) **M. S. Faruque**, Z. Wen, X. Wei, H. Casquero, "A comparative study of C^0, C^1, and G^1 spline constructions around extraordinary points", *World Congress on Computational Mechanics*, Vancouver, British Columbia (Canada), July 21-26, 2024.
- (20-min Invited talk) Z. Wen, **M. S. Faruque**, X. Li, X. Wei, H. Casquero, "Isogeometric Analysis using G-splines", *17th U.S. National Congress on Computational Mechanics*, Albuquerque, New Mexico (USA), July 23-27, 2023.

EXTRACURRICULAR RECOGNITIONS

- Ranked in the top 4 percent for best photos and the top 3 percent for best photographers in the *35AWARDS: Mobile Photography: Shadows 2020*, among 14,420 entries from 7,015 participants across 140 countries.
- Entered in the top 34 percent of the best photos in the photography theme contest *35AWARDS: Fog 2020* selected from 11,336 submissions by 4,475 participants across 128 countries.
- Awarded 1st Prize in the *Intra MIST Photography Exhibition 2019*, organized by the Photography Society of the Military Institute of Science and Technology, Bangladesh.

TECHNICAL SKILLS

Programming Languages: C++, C, Python, MATLAB

Software: Ansys, LS-DYNA

CITATION METRICS

Number of Citations: 25 (Google Scholar).

h-index: 2 (Google Scholar).

i10-index: 1 (Google Scholar).

IDENTIFIERS

ORCID: 0009-0008-2340-6798.