

Abdullah-Al-Amin

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Summary

- Demonstrated proficiency with Matlab and Python scripting through academic and industrial research.
- Non-linear FEA analysis expert for electrical-magnetic-thermal-mechanical coupled field problem.
- Proven MEMS and CFD expert through academic research.
- Manifested excellent written, verbal, and collaboration skills through scientific publications, collaborative research, and successful research outcome.

Work Experience

1/2018 ~ Present

Senior Engineer, Bridgestone Americas Technical Center, Akron, OH

- **Development of tire Force and Moment Prediction Tool.** Conceptualized, derived, developed, and coded the FEA-analytical tire performance prediction tool. Increased the efficiency of Virtual OE request handling by reducing the analysis time by 80% and increasing the accuracy by 40%. Leveraged the skills with Python, Matlab, Git, Jira to develop a software program for the Bridgestone HPC server.
- **Virtual OE Product Development.** Successfully leading virtual tire design, tire modeling, and development process using FEA for the OEM (GM, FCA) light and passenger truck tires. Reduced human intervention by 60% and automated the tydex file generation process.
- **IndyCar Racing pit stop.** Analyzed race tire temperature for IndyCar for tire performance improvement. Analyze failure, find root-cause, design the FEA model of tire blistering. Proposed a solution based on FEA analysis to develop a better product by eliminating tire blistering.
- **Truck Bus Radial 3D sipe study.** Completed ~5000 ABAQUS cohesive zone element (CZM) simulations using python scripting in the timespan of two months to train a model to decide on CZM parameters. The analysis was key in successfully model a tire sipe pull-out analysis.

8/2013 ~ 12/2017

Graduate Research Assistant, OPTIMISE. (<http://optimise.case.edu/>), Case Western Reserve University.

- **1.5 T Conduction Cooled MRI Magnet Design** (2013-2017). Built a non-linear multiscale multiphysics finite element model for the first of its kind MgB₂ based MRI magnet system.
- **Gout Instrument Device using Magneto-Optical Detection** (2015-2017). The patented technology for novel detection of gout crystal. Tools used: Lathe machine, laser optics, photodiode, a trans-impedance amplifier, ANSYS, Creo Parametric.

8/2010 ~ 8/2013

Graduate Research Assistant, MEMS Lab, The University of Akron.

- **Fermat Spiral Microparticle Separation Device** (2011-2013) Designed, developed, and microfabricated high throughput (700 μ L/min) microparticle separation device using CFD, photolithography, plasma etching, micropatterning, and experiment design.
- **Ionic Liquid Droplet Microgripper** (2010-2011) Elevated temperature (110° C) and low vacuum (24 in Hg) MEMS microgripper design based on electrowetting utilizing microfabrication, and characterization.

Education

- May 2018 **Case Western Reserve University.**
Doctor of Philosophy, Mechanical & Aerospace Engineering.
Dissertation: "Multiscale Multiphysics Stress-Strain Modeling for MgB₂ Based Conduction Cooled 1.5 T MRI Magnet System."
- December 2014 **The University of Akron.**
Master of Science, Mechanical Engineering.
Dissertation: "High Throughput Particle Separation Using Differential Fermat Spiral Microchannel with Variable Channel Width."
- March 2009 **Bangladesh University of Engineering and Technology.**
Bachelor of Science, Mechanical Engineering.

Class Rank: 31/117 (Top 30% of the class)

Dissertation: "Design, Improvement, Modification & Fabrication of Mechanisms and Control Systems of Robots for ABU ROBOCON."

Selected Awards

- VentureWell Stage I grant, VentureWell, Boston; USA (November 2016)
- Contest Runner-Up, Superconductivity News Forum (SNF), Applied Superconductivity Conference (October 2016)
- Financial Assistance, Applied Superconductivity Conference, Denver, Colorado; USA (September 2016)
- Fellowship, MIT Professional Education, Multiscale Material Design, Boston, USA (Summer 2016)
- Graduate Student Travel Award, Graduate School, Case Western Reserve University (May 2016)
- ISMRM Educational Stipend, 23rd annual meeting of ISMRM, Singapore City, Singapore (May 2016)
- ISMRM Educational Stipend, 22nd annual meeting of ISMRM, Toronto, Canada (May 2015)

Skills

- **Finite Element Analysis**: ABAQUS, ANSYS APDL & Workbench, COMSOL, ICEM
- **Computer-Aided Design**: Creo Parametric/*Pro-E*, SolidWorks, AutoCAD
- **Programming Language**: Python, Fortran, C, Matlab, MathCAD, Microcontroller programming
- **Libraries**: Panda, Scipy, Matplotlib, Numpy
- **Statistical Analysis**: Minitab, Excel, Matlab
- **Markup Language**: HTML & CSS, XML, Latex
- **Database**: My SQL
- **Agile Development**: Git, Jira
- **Containerization**: Docker
- **Electronics and Embedded Systems**: PIC 18F452, Atmel AT 89C51ED2, Atmel AVR ATmega 8 & 16.
- **Micro-fabrication**: Clean Room (Class 1000), Electrospinning, Plasma Bonding, Electroplating
- **Mechanical Machining**: Four-axis CNC Milling, Milling Machine, Lathe Machine, Bench Drilling, Mechanical wrenching.
- **Publishing**: Microsoft Office (Word, Excel, Powerpoint), Inkscape.
- **Graphing**: Origin, Matlab, Matplotlib, Sigmaplot.

Publications and Disclosures

10 Journal Articles, 5 Conference Proceedings, 1 Issued patent, and 93+ citations.

Leadership

Mentor, Multiscale Modeling and Simulation Group (mMAS) (04/2013~Current)

Founder, Developer, and Writer, (www.buetech.com), Online Technology Review blog. (01/2014~Current)

Founder and Idea lead, Obodharon, an animation-based learning platform for children. (01/2013~Current)

Treasurer & Website Admin, Bangladesh Student Association, University of Akron (08/2011~08/2013)

Senator, College of Engineering, University of Akron (03/2013~08/2013)

Voluntary Activities

Reviewer, Computational Mechanics [Impact Factor: 4.829]

Award Committee Judge, Tire Society (August 2018 – Present)

Athlete, Haslingden Cricket Club, Cleveland (05/2013~10/2017)

Popular Science Writer, Zero to Infinity, Bangla Popular Science Monthly. (01/2014~12/2016)

Zips Racing, University of Akron, Lift analysis of rear spoiler, ANSYS Fluent. (08/2012~11/2012)

References:

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Ozan Akkus

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