

Abdullah Al Amin

Postdoctoral Fellow, Northwestern University

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url: <https://neoceph.github.io/>

Location: Evanston, IL 60201.

Summary

- Authorized to work for any employer in the US (US Permanent Resident).
- 5+ years of experience for thermal analysis with FEA packages (ANSYS and Abaqus).
- Developed C++ based thermal CFD solver for laser-based metal additive manufacturing.
- 4+ years' experience in MRI magnetic, thermal, mechanical, and electrical design with ANSYS APDL.
- Industry experience with APQP, DFMEA, Six Sigma, statistics, prototyping, GD&T, and tolerance.
- Highly proficient with Solidworks and Creo Parametric CAD design tools.
- 3+ years of professional experience in vehicle analysis and the automotive industry.
- Excellent communication skills: 1 awarded patent, 1 awarded grant, and 16+ scientific articles.
- Industry experience with Electric Vehicles and Systems Engineering.
- Acquired electro-magnetic superconducting magnet knowledge transferrable to the design of electric motors.

Experience

Postdoctoral Fellow, Northwestern University, Evanston, IL (02/2021 ~ Present)

- Additive Manufacturing CFD model development. Developing a CFD-FEA C++ code to predict the part qualification, lack of fusion porosity, keyhole porosity of laser powder additively manufactured metallic part. (<https://github.com/neoceph/AM-CFD>)

Engineering Analyst, Endurica LLC, Findlay, OH (09/2021 ~ Present)

- Fatigue Analysis of polymer materials for Tires, automobile bushing, control arm etc., using proprietary software combined with Abaqus scripting.
- C++ proprietary software development for fatigue analysis.

Research Engineer, Bridgestone Americas Technical Center, Akron, OH (01/2018 ~ 02/2021)

- Virtual OE Product Development. Improved GM rating to the second-best supplier of Virtual OE Tire Data (02/2019). Successfully led 10+ virtual tire designs, including mechanical design for electric vehicles for OEMs (GM, FCA, Rivian).
- Hybrid analytical-FEA tire Force and Moment Tool. Developed python-based in-house analytical-FEA system for vehicle analysis with tires. The code reduced experimental tests by 50% resulting in the 2020 GM best supplier of the year.
- Truck Bus Radial 3D sipe study. Developed methods to automate and execute ~5000 ABAQUS cohesive zone element (CZM) FEA simulations in two months. The analysis was key in successfully modeling a tire sipe pull-out analysis.

Graduate Research Assistant, Case Western Reserve University, Cleveland, OH. (08/2013 ~ 12/2017).

- Cooling System Design of 1.5 T MRI Magnet (08/2013-12/2017). Developed an electro-magnetic and thermo-mechanical multiscale multiphysics finite element (FEA) model for the first of its kind MgB₂-based MRI magnet system. Required Electrical Engineering, Mechanical Engineering, and System Engineering knowledge.
- Gout Instrument Device using Magneto-Optical Detection (03/2015-12/2017). Developed patented technology for novel detection of gout crystal. Tools used: Lathe machine, laser optics, photodiode, a trans-impedance amplifier, ANSYS, Creo Parametric.

Graduate Research Assistant, The University of Akron. (August 2010 ~ August 2013)

- Fermat Spiral Microparticle Separation Device (01/2011-08/2013) Designed, developed, and microfabricated high throughput (700 μ L/min) microparticle separation device using CFD, photolithography, plasma etching, micropatterning, and experiment design.

Education

Doctor of Philosophy, Mechanical & Aerospace Engineering. (05/2018)

Case Western Reserve University.

Dissertation: “Multiscale Multiphysics Stress-Strain Modeling for MgB₂ Based Conduction Cooled 1.5 T MRI Magnet System.”

Master of Science, Mechanical Engineering. (12/2014)

The University of Akron.

Dissertation: “High Throughput Particle Separation Using Differential Fermat Spiral Microchannel with Variable Channel Width.”

Bachelor of Science, Mechanical Engineering. (03/2009)

Bangladesh University of Engineering and Technology.

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

Selected Awards

- VentureWell Stage I grant, Boston; USA (November 2016)
- Contest Runner-Up, Superconductivity News Forum (SNF), Applied Superconductivity Conference (October 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, Hyperworks, LS-DYNA, COMSOL
- Computer-Aided Design: Creo Parametric/*Pro-E*, SolidWorks, AutoCAD, 3D Cad, Siemens NX
- Programming Language: Python, C++, Fortran, C, Matlab, MathCAD
- Libraries: Panda, Scipy, Matplotlib, Numpy, Jax
- Markup Language: HTML & CSS, XML, Latex
- Database: My SQL, PSQL, MongoDB
- Agile Development: Git, Jira
- Containerization: Docker
- Mechanical Machining: Four-axis CNC Milling, Milling Machine, Lathe Machine, Bench Drilling, Mechanical wrenching.
- Graphing: Origin, Matlab, Matplotlib, Sigmaplot.
- Others: Numerical Methods, High-Performance Computing, Software Development, Software Design, Programming Skills, Algorithms, Microsoft Office (Word, Excel, Powerpoint), Inkscape.

Publications and Disclosures

11 Journal Articles, 5 Conference Proceedings, 1 Issued patent, 200+ citations, h-index 7, i10-index 6.
<https://scholar.google.com/citations?user=dkLvoWwAAAAJ&hl=en&oi=ao>

Leadership

Mentor, Multiscale Modeling and Simulation Group (mMAS) (04/2013~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], Proceedings of the Institution of Mechanical Engineers: Part C, IEEE Transactions on Applied Superconductivity.

Award Committee Judge, Tire Society (August 2018 – 2020)

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

On Request.