

FOUAD ALI

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MECHANICAL ENGINEER

Product Research, Development, and Validation | Modeling and Simulation | Process Engineering

Mechanical Engineering professional with 6 years of experience in computational fluid dynamics (CFD), finite element analysis (FEA), and high-performance computing (HPC) for automotive, aerospace, defense, computer hardware, and steel production. My experience has provided me with a strong background in conceptualization, problem solving, and process engineering as well as product life cycle management, strategic sales, marketing, and customer success. Immensely dedicated to organizational product optimization by exploring all methods to improve efficiency, maximize performance and reduce costs. Proficient in SolidWorks, CATIA, AutoCAD, Inventor, Creo, NX6, ANSYS Workbench, OpenFOAM, COMSOL, C++, Python.

- New Product Development
- Cross-Team Collaboration
- Sales and Marketing Support
- Requirements Analysis
- Project Scheduling
- Production Environment
- Electro-Mechanical Controls
- Multi-Disciplinary Solutions
- Automated Parametric Optimization
- Computational Fluid Dynamics
- Design for Manufacture and Assembly
- High Performance Computing
- Design of Experiment
- Virtual and Physical Prototyping
- Major Capital Projects
- Process Analysis
- Systems Engineering
- Strategic Communications
- Design Validation
- Performance Testing
- Professional Development

PROFESSIONAL EXPERIENCE

PRODUCT RESEARCH AND DEVELOPMENT ENGINEER

April 2013 – January 2016

Vesuvius USA, Cleveland, OH

- Developed innovative solutions for global leader in metal flow engineering enabling world's largest steel producers to improve manufacturing process performance, reduce energy consumption, and operate safer.
- Delivered \$10M of successful process optimization projects in 2015 for Nucor, Steel Dynamics, Hyundai, ArcelorMittal, Nippon and Sumitomo, Tata, China Steel, Rizhao, Hesteel, Baosteel, ThyssenKrupp AG, Gerdau, and India Steel.
- Recovered \$8M annually in by-product waste reduction via process optimization for United States Steel Corporation.
- Implemented 300% quicker data extraction method and 30% faster processing capability saving \$100K annually.
- Researched, developed, implemented, validated, and advanced Vesuvius' existing patented, high profit margin process flow control design methodologies, and business procedures from inception to after-deployment support.
- Collaborated with highly specialized production and tooling personnel as liaison between Engineering and Manufacturing to define and solve manufacturing and design issues and implement cost reduction ideas.
- Conducted onsite measurements, visits, user walkthroughs, and oversaw product launches and introductions.

AERODYNAMICS AND MECHANICAL DESIGN ENGINEER

April 2012 – May 2013

The Boeing Company, Carbondale, IL (Capstone)

- Designed award winning 2040 Boeing air-superiority fighter jet prototype ejection system, laser defense, entry and egress, avionics, and full scale cockpit prototype as part of an interdisciplinary, cross functional team.
- Innovation brainstormed in sessions with team, sponsors, project champions, and Boeing Company members.
- Conceptualized, designed, analyzed, and optimized detachable ejection pod aerodynamics, and structural integrity.
- Analyzed cockpit structural integrity and force impacts with ANSYS explicit and dynamic finite element analysis.
- Completed ejection pod aerodynamics modeling in 1/3 time utilizing CFD simulation over physical scale model.
- Presented Boeing Vice President data and analysis in accordance with customer requirements and specifications.

ELECTRO-MECHANICAL ENGINEER INTERN

May 2009 – August 2010

BFG Technologies, Lake Forest, IL

- Developed class leading, first of its' kind GTX 295 H2OC dual GPU, liquid cooled NVIDIA graphics card.
- Designed robust solutions for management of thermal dissipation, fan speed, electrical power draw, and coolant flow.
- Reduced computation delay time for engineers and support staff by 75% effectively saving \$400K a year.
- Documented official procedures, hands-on prototype fabrication, conducted prototype tests, gathered and organized test data, presented test findings to team and upper management.
- Executed prototype tests from start to completion encompassing design of experiment, test setup, instrumentation, data collection, analysis, design recommendation, and presenting results to engineering team and management.

EDUCATION

Master of Science, Mechanical Engineering , Iowa State University, Ames, IA	2015 – Present
Bachelor of Science, Mechanical Engineering , Southern Illinois University, Carbondale, IL	2010 – 2013
Associate of Science, Automotive Technology , Joliet Junior College, Joliet, IL	2005 – 2009

ADDITIONAL EXPERIENCE

ASSISTANT STORE LEADER TRAINEE

February 2009 – January 2010

OfficeMax #6082, Joliet, IL

- Achieving best store annual sales in 17 years of operation and most profitable in district for 2009.

DESKTOP, WORKSTATION AND IT CONSULTANT

July 2005 – January 2010

Frankly Easy Computer Repair, Chicago, IL

- Saved James Owens Academy \$100K in repair and system downtime costs by upgrading 200+ Dell school computers.

STORE OPERATIONS MANAGER

January 2007 – February 2009

Silver Fox Pastries, Palos Heights, IL

- Grew business 2000% to 3rd largest wholesale bakery by market share serving city of Chicago in 2 years.

AUTOMOTIVE SERVICE TECHNICIAN

June 2004 – January 2007

Autonology, Chicago, IL

- \$1M of foreign, luxury, and exotic vehicle service tasks including rebuilds of powertrain, suspension, and sub frames.

COLLEGIATE ENGINEERING EXPERIENCE

AVIATION AND ELECTRO-MECHANICAL ENGINEER – AIR FRAME, CONTROLS, TESTING

May 2012 – June 2013

Institute of Electrical and Electronics Engineers (IEEE) Robotics Club, SIU Carbondale, IL

- Founded IEEE sponsored robotic club to compete in intercollegiate remote and automated drone competition.
- Programmed Arduino microcontroller vector field algorithm for 3D sonar guided flight collision avoidance system.
- Developed ultra-light weight, structurally sound carbon fiber airframe design with FEA based virtual prototype.
- Successfully entered SIU into *Ivy league* dominated, Intel sponsored drone competition for first time.

AUTOMOTIVE ENGINEER – ENGINE PERFORMANCE, BRAKE, AERODYNAMICS, AND COOLING

May 2010 – May 2013

Society of Automotive Engineers (SAE) Formula Race Team, SIU Carbondale, IL

- Placed 1st in intercollegiate formula race competition out of 80 teams with powerful, cost effective design.
- Enhanced aftermarket fuel injection system to deliver peak horsepower from donated Kawasaki motorcycle engine.
- Adapted Baja Kart brake system design, compensated for greater heat generation with minor modification.
- Performed computer and physical vehicle aerodynamics analysis utilizing CFD and LabVIEW wind tunnel testing.
- Successfully utilized aerodynamics data to persuade team in optimizing radiator placement against cosmetic desire.

AUTOMOTIVE ENGINEER – BRAKE, SUSPENSION, AND FRAME

April 2010 – May 2012

Society of Automotive Engineers (SAE), SIU Carbondale, IL

- Fantastic improvement in finish of Briggs & Stratton powered off-road vehicle design competition, from 103rd to 55th
- Engineered 150% lighter pedal actuated, dual channel, all wheel Polaris based hydraulic disc brake system.
- Developed robust Bilstein damped double wishbone suspension from clean slate to replace defective previous system.
- Optimized impact ready monocoque structural system enclosure in full compliance with strict SAE guidelines.

MECHANICAL ENGINEER – SEATING STRUCTURAL ANALYSIS AND ERGONOMICS

May 2010 – April 2011, May 2013

National Aeronautics and Space Administration (NASA) Moonbuggy Challenge, SIU Carbondale, IL

- First time completion of NASA lightweight folding two-person pedal powered obstacle course vehicle competition.
- Conducted structural analysis tests, documented, organized, and presented findings to NASA officials.
- Top 10 finish after later date redesign of comfortable, sturdy, and structurally sound seating for taller riders.

PUBLICATIONS AND PROJECTS

ENERGY AND EXERGY ANALYSIS AND COMPARISON OF CONVECTIVE COOLING SOLUTIONS

December 2016

Advanced Thermodynamics, Iowa State University, Ames, IA

- Proposed innovative and feasible 50% energy waste reduction solution to the United States Air Force

U.S. AND U.K. MOTOR FUEL TAX POLICY EFFECTS ON NEW VEHICLE EFFICIENCY AND EMISSIONS

December 2016

Economics and Policy of Engineered Energy Systems, Iowa State University, Ames, IA

3D KÁRMÁN VORTEX STREET HPC VALIDATION OF COMPLEX GEOMETRY IN WATER STREAM

May 2016

Viscous and Turbulent Fluid Flow, Cleveland State University, Cleveland, OH

GPU ENABLED HIGH PERFORMANCE COMPUTE (HPC) CLUSTER FOR ENGINEERING APPLICATIONS

April 2015

Fouad Ali's Kitchen, Cleveland, OH

- Designed, built, and optimized 12 AMD node 5B FLOPS InfiniBand grid server for multiphase and gasification analysis

LECTURE ON MODERN FUEL CELL FUNDAMENTALS, TECHNOLOGY, AND APPLICATIONS

February 2013

Internal Combustion Fundamentals, Southern Illinois University, Carbondale, IL

- Researched, organized, prepared, and taught engineering class on fuel cell concepts, history, types, and applications.