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Onkar Salunkhe

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SUMMARY

Masters student in Mechanical Engineering with experience in FEA in automobile domain and software development. Actively seeking Internship / Co-op starting in Summer (May) 2020.

EDUCATION

Michigan Technological University

Master of Science in Mechanical Engineering: Design | FEA | Machine Learning | GPA: 4.0/4.0

Houghton, Michigan
August 2019 - Expected April 2021

Vishwakarma Institute of Technology (VIT), Pune

Bachelor of Technology in Mechanical Engineering | CGPA: 9.09/10

Pune, India

July 2014 - May 2018

Honors (Equivalent to Minors): Automobile Engineering | CGPA: 9.40/10

July 2016 - May 2018

Industry Collaborated Courses: Ready Engineers Program by Tata Technologies Pvt. Ltd. | Steam Engineering by Forbes Marshall Pvt. Ltd.

Courses: Design for reliability, Finite Element Methods(FEM), Fluid Mechanics, Machine Learning, Strength of Materials, Vehicle dynamics.

RESEARCH EXPERIENCE

Michigan Technological University

Graduate Student Researcher: Mechanical Engineering Department

Houghton, Michigan
September 2019 - Present

- Advisor: [Dr. Gregory Odegard](#).
- Part of Computational Solid Mechanics group.
- Research focused on implementing Finite Element Methods and analysis of FEA simulations.
- Currently working on a project by Lightweight Innovation For Tomorrow(LIFT) to optimize automobile differential case.

Indian Institute of Technology (IIT), Bombay

Research Intern: Mechanical Engineering Department | GPA: 10/10

Mumbai, India
January 2018 - June 2018

- Advisor: [Dr. Parag Tandaiya](#)
- Finite Element Analysis (FEA) of Bulk Metallic Glass (BMG) composites. | [Poster Presentation](#).
- Numerically investigated mechanical behavior of BMG through finite element simulations using ABAQUS software.
- 2 % strain plasticity enhancement is achieved with 5 % thickness of the copper coating on monolithic BMG matrix.

EXPERIENCE

Dassault Systèmes

R&D Development Associate Engineer: CATIA

Pune, India
June 2018 - August 2019

- Assisted senior developers in migrating CAD from CATIA V4 to CATIA V5 and above levels.
- Constructed a 1-dimensional finite element solver in FORTRAN77 using matrix algebra.
- Promoted the source code changes for Incident Reports, ODTs and Memory Leaks on CATIA V5 and 3DEXPERIENCE.
- Volunteered for the events of 3DEXPERIENCE Innovation Lab and headed race-car track design team for the racing event.

John Deere, Pvt. Ltd.

Engineering Intern: Vehicle quality

Pune, India
June 2017 - July 2017

- Designed a lightweight tool to assemble a stiff spring in brake pedal considering the ergonomic considerations.
- Analysed the process performance and suggested corrective actions to improve the process quality.
- Root cause analysis of steering wheel cut marks and suggested the process improvement on the assembly line.

PROJECTS

• Design and FEA of Automotive Differential case (CAE Durability)

September 2019 - Present

- Modified the design of a Differential Case to reduce the stress concentration and weight.
- Working on the FEA analysis on Optistruct with ductile iron material for desired fatigue life.
- Running Topology optimization using Altair Optistruct to generate innovative concept design.

• Finite Element Implementation of ductile damage model : Application to automobile gear tooth

September 2019 -

December 2019

- Implemented Explicit/Dynamic simulation of ductile damage model using Abaqus 6.13.
- Achieved the stability of Finite Element Simulation using mesh convergence.
- Observed the failure at gear tooth root and compared with existing experimental results.

- **Reliability analysis of FEA simulations with Implementation of Machine Learning Method** *September 2019 - December 2019*
 - Performed reliability analysis of FEA using FORM and Kriging (ML) method on MATLAB.
 - Automated the FEA simulations of 10 bar 2D planar truss on ABAQUS 6.13 using Python Macros. Latin Hypercube Sampling (LHS) is used for sampling.
 - Implemented Machine Learning method with adaptive sampling for Reliability Based Design Optimization (RBDO).
- **Finite Element Modelling for Hyper-velocity impact of Aluminium sphere on a plate** *May 2018 - June 2018*
 - Simulated a hyper-velocity impact model of aluminum sphere projecting on a aluminium plate at the velocity of 6.8 km/sec.
 - Performed Explicit/Dynamic simulation with Smooth Particle Hydrodynamics (SPH) to model large deformations and strains.
- **Design and prototyping of Automatic wiper mechanism** *July 2017 - December 2017*
 - The project aimed to design, simulate and manufacture the Automated wiper mechanism using IR sensor.
 - IR sensor was used to detect rain or water on the windshield. The signal from IR sensor was given to Arduino and controlled the wiper motor through relays.
 - The project is sponsored by Dassault Systèmes.
- **Optimization of fluid flow for heating of water by Nichrome wire with variations in wire geometry** *January 2017 - June 2017*
 - Decided the Nichrome wire geometry to optimize the heat transfer in water for uniform temperature distribution.
 - Computational Fluid Dynamic(CFD) simulation was carried out on Solidworks to see the convection currents in the fluid.
 - The experimental results were carried out in Heat Transfer Lab of VIT, Pune, India.
- **Mathematical modeling, design and simulation of Planimeter** *July 2016 - December 2016*
 - Designed a planimeter which determines the area under the curve with 5 % tolerance.
 - The project aimed to understand the mathematical modeling behind the planimeter and simulate the design in SolidWorks to validate it.

PUBLICATION

Onkar Salunkhe, Neeraj Vijantkar, and Santosh Joshi, [Selection of tires based on cornering stiffness for formula student car](#) *International Journal for Research in Applied Science and Engineering Technology Volume 5 Issue 6 September pp.2056-2063, 2017.*

SCHOLASTIC ACHIEVEMENTS

- **5 Gold Medals:** Science and Mathematics Olympiad by Science Olympiad foundation as *school topper*.
- **Best student award:** by *District Council of India* for successive achievements in scholarship examinations.
- **Topper's list by State:** Scoring 100% in 10th standard in *Secondary School Certificate* among 1 million students.
- **Topper:** Among top 5 students in *Ready Engineers program* by Tata Technologies Pvt. Ltd.
- **3rd rank:** Online course on NPTEL Mechanics of Solid by *Indian Institute of Technology, Kanpur*.

LEADERSHIP AND EXTRACURRICULAR EXPERIENCE

- **President of Ekasutram** | VIT's Mathematics club | Student organisation | VIT Pune *April 2016 - May 2017*
 - Encouraged students to discuss engineering problems with pure mathematical ideas.
 - Delivered guest lectures to mathematics enthusiasts in different institutions.
- **Senior steering design and CAE Engineer** | Veloce Racing | Formula Student Team | VIT Pune *August 2015 - December 2016*
 - Designed and manufactured the steering sub-system for formula student vehicle.
 - Headed the CAE department in the team to perform FEA and CFD simulations of crucial parts of the vehicle.

SKILLS

- **Software:** ABAQUS, ANSYS, ADAMS, Arduino, AutoCAD, CATIA, Creo/ProE, HYPERMESH, LS-DYNA, MS Office products, Optistruct, SolidWorks, 3DEXPERIENCE.
- **Programming Languages:** C++, FORTRAN77, MATLAB, Mathematica, Python.

INTERESTS

- Badminton | Football | Music | Piano.