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# Onkar Salunkhe

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## SUMMARY

I am a Masters student in Mechanical Engineering with experience in CAE in automobile domain and software development. I am an experienced professional with strong problem solving and analytical skills and effective communication skills. Actively seeking Internship / Co-op starting in Summer (May) 2020. **Open for relocation all over the USA. Currently on F1 VISA.**

## EDUCATION

**Michigan Technological University**                                                                                    Houghton, Michigan
*Master of Science in Mechanical Engineering: Design | FEA | Machine Learning | **GPA: 4.0/4.0***            *August 2019 - Expected August 2021*

**Vishwakarma Institute of Technology (VIT), Pune**                                                             Pune, India
*Bachelor of Technology in Mechanical Engineering| **CGPA: 9.09/10***                                            *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**                                                                                    Houghton, Michigan
*Graduate Student Researcher: Mechanical Engineering Department*                                     *September 2019 - **Present***

- *Advisor:* Dr. Gregory Odegard.
- Leading a project team in Computational Solid Mechanics group.
- Research focused on implementing Finite Element Methods and analysis of FEA simulations.
- Currently working on a project in Abadi lab to design a biomedical actuator using FEA.

**Indian Institute of Technology (IIT), Bombay**                                                                Mumbai, India
*Research Intern: Mechanical Engineering Department| **GPA: 10/10***                                       *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 the monolithic BMG matrix.

## EXPERIENCE

**Dassault Systèmes**                                                                                                           Pune, India
*R&D Development Associate Engineer: CATIA*                                                                     *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 customers as Boeing and Meyer Werft a on CATIA V5 and 3DEXPERIENCE.
- Volunteered for the events of 3DEXPERIENCE Innovation Lab and headed the race-car track design team for the racing event.

**John Deere, Pvt. Ltd.**                                                                                                      Pune, India
*Engineering Intern: Vehicle quality*                                                                                    *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 for customers in Europe.
- Root cause analysis of steering wheel cut marks and suggested the process improvement on the assembly line.

## PROJECTS

- **Design and FEA of bending Guidewires of Carbon Nanotubes using actuators for Biomedical applications**
  *January 2020 - **Present***

  - The objective is to use FEA to design a working actuator for specific guidewires and then make it in the lab using bio-compatible nanomaterials for application like Catheter.
  - Working on the FEA analysis of Piezoelectric materials on SIMULIA ABAQUS.
  - The project will aim at developing bending actuators using a geometrical combination of linear actuators.

- **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 study.
- Predicted 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 a 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 Modeling for Hyper-velocity impact of Aluminium sphere on a plate**       *May 2018 - June 2018*
  - Simulated a hyper-velocity impact model of an aluminum sphere projecting on an aluminium plate at the velocity of 6.8 km/sec.
  - Performed Explicit/Dynamic simulation with Smoothed Particle Hydrodynamics (SPH) to model large deformations.

- **Design and prototyping of Automatic wiper mechanism**       *July 2017 - December 2017*
  - The project aimed to design, simulate and manufacture the Automated wiper mechanism using an 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 was sponsored by Product Innovation Laboratory of 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*
  - Managed the team of design and manufacturing of 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, Autodesk FUSION 360, Generative Design, HYPERMESH, Inventor, MS Office products, Optistruct, Radioss, Siemens NX, SolidWorks, 3DEXPERIENCE.
- **Programming Languages**: C++, FORTRAN 77, MATLAB, Mathematica, Python.

## INTERESTS

- Badminton | Football | Music | Piano.