Vineet Nagar

+91-9991515875
vine1601@gmail.com
www.linkedin.com/in/vineeting
Palwal, Haryana, India

PROFESSIONAL SUMMARY:

Mechanical Design & FEA Engineer with 3 years of experience in high-load mechanical systems, specializing in structural optimization, mechanism design, and simulation-driven product development. Experienced in static, contact, and fatigue analysis using ANSYS, Abaqus, and SolidWorks for validation of structural integrity and load-bearing components. Published researcher in fatigue behavior of additively manufactured SS316L with strong interest in automotive and aerospace R&D environment.

EXPERIENCE:

- **Sr. Engineer (Mechanical Design & FEA)** in **ISGEC Heavy Engg. Ltd**, Yamuna Nagar, Haryana **(July 2023-Present)**
  - Designed and validated load-bearing mechanical components including **gears, shafts, flywheels**, **linkages**, and **structural** assemblies for high-capacity press systems using AGMA-based design methodologies and engineering standards.
  - Developed and optimized **4-bar and 6-bar mechanisms** for controlled motion profiles and improved force transmission under dynamic loading conditions.
  - Performed **static, contact, and fatigue FEA** on critical structural and rotating components to evaluate stress distribution, deformation, and fatigue-sensitive regions under cyclic loading.
  - Conducted **hot-spot stress analysis** and weld evaluation for structural components; prepared technical reports, SOPs, and engineering guidelines.
  - Developed **parametric Excel and SolidWorks-based automation tools** for repetitive design calculations and drawing generation, significantly improving modelling efficiency and reducing design iteration effort.
  - Applied DOE and root-cause analysis methodologies for shaft optimization, improving structural strength by ~24% while reducing manufacturing rework.
  - Correlated FEA results with analytical calculations to improve reliability in design validation.
  - Supported prototype validation and design iterations using analytical calculations and simulation-backed engineering insights
  - Collaborated with **testing, and quality teams** to validate designs and GD&T, resolve production issues and implement engineering improvements.
  - Generated manufacturing-ready 3D models, GA drawings, assembly layouts, detailed drawings, and BOMs for multiple projects.
  - Collaborated across testing, quality, and manufacturing, **GD&T** implementation, supporting DFMEA, ISO/CE compliance, audits, and standardization activities.
  - Led 5S implementation initiatives within the department to improve workplace organization and engineering workflow efficiency.

➢ **Key projects:**

- ✓ **1250 Ton** blanking press designing & FEA (JBMA, Kharkhoda)
  - Performed structural and load analysis of crown, bed, slide, pin, and moving bolster assemblies under peak operational loading conditions
  - **Reduced structural deflection by 12%** through rib structure redesign and stiffness optimization
- ✓ 1000 Ton **Link Drive Mechanical Press** line (Neel Metal, Haridwar)
  - Designed Gear train, Die Cushion, Damper assemblies based on load, torque.
- ✓ Optimisation in 1200 Ton Hydraulic Press (Mahindra CIE Automotive India Ltd., MH)
  - Achieved **18% raw material reduction** through topology optimization of cylinder, ram, and slide assemblies while maintaining structural integrity and stiffness requirements
- ✓ 315 T **Hot Forging** Mechanical Press (Minda, Gurugram)
  - Led complete mechanical system development crankshaft-based motion mechanism.
  - Developed automated pick-and-drop mechanism & improving operational cycle efficiency by ~33%

PROJECT/RESEARCH WORK:

- **Experimental and Numerical study of Tensile and Fatigue behavior of SLM printed SS-316L specimens** (MNNIT Allahabad, Prayagraj) **(06/2022 - 05/2023)**
  - o Investigated low-cycle fatigue behavior through experimental testing and FEA, establishing correlation between heat treatment, microstructure, and fatigue-life improvement under cyclic loading conditions.
  - o Experimental fatigue test is validated through numerical study on Abaqus & Ansys Mechanical
- **Automatic Adjustable Solar Panels System** (CDLSIET, Sirsa) **(08/2020 - 05/2021)**
  - o Fabrication of automatic adjustable solar panel for harnessing maximum electrical energy output.
  - o Design of optimal orientation of the panel in the direction of sun rays to give maximum power.
- **Automatic Electric Vehicle** (CDLSIET, Sirsa) **(02/2019 - 06/2019)**
  - o Design and development of eco-friendly, time-saving, minor traffic, safe and economical prototype of an automatic electric vehicle based on the path follower concept.

RESEARCH PUBLICATION:

- **Research Paper:** Experimental and numerical study on the fatigue behaviour of pre and post heat treated additively manufactured SS 316L specimens (Publisher: **Elsevier**) **(29 Jun 2024)**
- **Conference paper**: 5th Indian Conference on Applied Mechanics (**INCAM 2022**) on "Effect of heat treatment on the time dependent behavior of 3D printed SS-316L specimen." (Publisher: **NIT Jamshedpur**) **(12 Nov 2022)**
- **M.Tech. dissertation work** (Publisher: **MNNIT Allahabad**) **(12 Jul 2023)**

EDUCATION:

✓ **M. Tech.** in Engg. Mechanics & Design	NIT Allahabad, Prayagraj (MNNIT)	8.5/10	(2021-2023)
✓ **B. Tech.** in Mechanical Engineering	Ch. Devi Lal University, Sirsa	7.5/10	(2017-2021)

SKILLS:

- CAD & Modelling: **SolidWorks**, AutoCAD
- **Simulation**: **ANSYS Mechanical**, Abaqus and SolidWorks (**Static, contact, Nonlinear, & Fatigue analysis**)
- Tools: **Advanced Excel**, Engineering Calculations, Technical Documentation
- Engineering Methods: Mechanism design, GD&T, DFMEA, DOE, DFM/DFA
- Languages Known**:** Hindi, English

Additional Activities:

- **Secretory** at ISGEC Ynr **CSR** group "ISGEC_Cares" ISGEC Heavy Engg. Ltd
- Freelancer as Subject Matter Expert in **Physics** (2019-2022) Chegg India Pvt Ltd
- Organizing member in International **Conference** AIR-2022 in MNNIT Allahabad