Vania Aman Chopra

(919) 949-4146 | vaniachopra@gmail.com | www.linkedin.com/in/vaniaachopra |
Portfolio: vaniaamanchopra.com

EDUCATION

Duke University 2021 - 2025

BSE in Mechanical Engineering|Minor in Computer Science|Certificate in Innovation & Entrepreneurship

Relevant Coursework: Engineering Design and Communication, Computational Methods in Engineering, Engineering Innovation, Mechanics of Solids, Data Structures and Algorithms, Structures and Properties of Solids, Thermodynamics, Fluid Mechanics, Mechatronics

Engineering Skills: Creo, SolidWorks, FEA & CFD Analysis, Component design and testing, Manufacturing processes, Tolerance Analysis, Injection Molding, Laser Cutting, 3-axis CNC milling, GD&T, Sawing, Welding (TIG, MIG, Arc), Mechanical Design
Electrical/ Software Skills: MATLAB, Python, Java, Arduino, C, MIPS, Arduino, LaTeX, PCB Design

Activities and Honors: Society of Women Engineers mentor, Duke Women in Technology explore leader

Interests: Soccer (National Team), Indian Vocal Music (BA), Sketching, Baking, Lego, Automotive Design

WORK EXPERIENCE

Sears Seating May 2024 - July 2024

Product Design Engineering Intern| Davenport, Iowa

- Designed a swivel mechanism for tractor seat armrests, ensuring a 270-degree rotation without windshield interference and a 12.5% reduction in user time by implementing a 90-degree forward-moving armrest system using Creo for CNH and John Deere equipment.
- Optimized seating systems by revising 10+ technical drawings to align with new company constraints, resulting in a 2% reduction in manufacturing defects and an increase in product lifecycle.

Independent Research with Blum Group August 2024 - Present

Research Fellow | Duke University, Durham

- Applied DFT relaxation to refine hydrogen positions in 22 hybrid perovskites, reducing XRD displacement errors by up to 0.345 Å and achieving an average bond length refinement of 1.36 Å. Analyzed hydrogen bonding interactions and structural distortions, identifying displacement trends (0.30–0.35 Å) and bond length variations (1.09–2.19 Å). Presented a research paper detailing these findings.
- The findings were presented at CHOISE, highlighting advancements in hydrogen corrections and stability analysis.

Innovation Co-Lab February 2023 - February 2024

Lab Technician | Duke University, Durham

- Maintained and repaired 50+ 3D printers, water jets, milling machines, and laser cutters, ensuring optimal operation.
- Provided technical support to 5+ students/day, guiding them through engineering projects involving CAD (Solidworks) and 3D printing.

Sona Comstar May 2023 - July 2023

Product Strategy Intern| New Delhi, India

- Conducted an in-depth competitor analysis of 19 leading companies in the Automotive Component Industry, focusing on electric vehicle (EV) components from Bosch, Denso, AAM, BorgWarner, Continental and more.
- Provided technical advice to the engineering team on design modifications to Sona Comstar's EV components based on competitor benchmarking, to enhance their product efficiency and alignment with industry standards.

Power Spack for Hyundai Transys Lear Automotive India Pvt. Ltd May 2022 - July 2022

Production Engineering Intern| New Delhi, India

- Implemented a part identification system using barcode printing and scanning technology, integrated with SCADA, PLCs and ERP and their custom software.
- Reduced assembly errors by 90%, improved production efficiency by 30%, cut part identification time by nearly 50%, leading to significant cost saving and enhanced manufacturing efficiency.

TECHNICAL PROJECTS

Urban Concept Electric Vehicle – Shell Eco-Marathon/ Duke Electric Vehicle Team August 2024 - Present

- Co-led design and fabrication of aluminum chassis, frame and shell using Solidworks; performed FEA on rollbar, chassis and hinges with safety factors> 11. Delivering a fully functioning road-ready vehicle to the Duke Electric Vehicle (DEV) team.
- Welded frame and formed sheet metal shell; engineered 3D-printed locking and hinge systems for trunk, frunk , and doors using pendulum- based impact analysis. Hand-built internal acrylic structures for electrical isolation.
- Spearheaded simulation plans for vibrational FEA, driver-compartment thermal analysis, and CFD-based aerodynamic testing including future wind tunnel validation. Ensured ergonomic access, subsystem integration and full compliance with Shell Eco-Marathon constraints.

Water Soil Interactions – Duke Gardens October 2021 - January 2022

- Created a visual model to display water-soil interactions that effectively communicates information to visitors from all age ranges.
- Iterated multiple prototypes using SolidWorks, Woodworking and Arduino according to the client's needs.

Car Seat Comfort - PU Foam Analysis July 2019 - October 2020

- Conducted an analysis of the relationship between PU foam hardness and indenter size, using JIS and ASTM standards, to optimize car seat comfort for various vehicle types.