

Vidya Avadutala

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Visionary Mechanical Engineer with over 20 years of transformative expertise in CAE simulations, product development, and optimization for electric vehicles (EVs), fuel cell systems, and advanced automotive applications. Recognized for pioneering innovative designs and driving cost efficiencies through advanced FEA, CFD, and MBD analyses. Proven leader in managing global, high-impact projects, delivering cutting-edge solutions that redefine performance, sustainability, and reliability in the mobility industry.

Work Experience

Nikola Corporation.

Manager/Staff Engineer, CAE | August 2021 – Present (USA) | 3.5 years

- Spearheaded the design and development of next-generation electric and fuel cell vehicles, focusing on minimizing cost and weight using advanced finite element analysis (FEA) techniques.
- Led the design and optimization of a hydrogen fuel cell backpack structure from concept to production, achieving a weight reduction of approximately 200 lbs per unit while enhancing performance and durability.
- Developed and validated frame twist load cases for fuel cell and battery electric vehicle chassis systems, correlating simulation results with physical tests and multibody dynamics (MBD) analysis.
- Conducted impact and strength simulations on BEV and FCEV cab doors using Abaqus explicit solver, ensuring structural integrity and performance.
- Performed strength and durability simulations on various BEV and FCEV systems, including body, chassis, and powertrain, to ensure design robustness.
- Performed structural simulations on battery packs and battery mounting structures using detailed modeling techniques and correlated with proving ground results.
- Conducted vibration and shock analysis using random vibration techniques and life calculations, evaluating the performance and longevity of electronic components in both BEV and FCEV platforms.

Stellantis.

CAE Engineer | July 2016 – July 2021 (Canada) | 5 years

- Collaborated with the powertrain team to deliver CAE results for dynamic stress and durability simulations on engine mounts.
- Developed a durability methodology correlating proving ground simulations with lab tests, reducing costs by eliminating low-priority tests (2020 SAE Paper published).
- Conducted non-linear analysis of plastic components, optimizing design for improved manufacturing and development.
- Performed optimization studies on truck automatic steps, achieving a lightweight, high-strength design.
- Validated cross-car beam designs with impact simulations using LSDYNA and Radioss solvers.

Design Through Simulation Co., Ltd.

Technical Specialist | April 2011–June 2016 (Thailand) | 5 years

- Directed a startup specializing in mechanical design and CAE software services, focusing on high-end simulation technology.
- Partnered with Altair Hyperworks, Nova Cast, and NX CAE, providing support and selling CAE software to organizations.
- Delivered 20+ workshops and seminars on CAE simulation technology across India and Asia.
- Trained engineers in Tier-1 organizations and Automotive OEMs in India, Malaysia, and Thailand on CAE simulations.
- Designed and implemented a 'Crash Simulation Methodology' for SIRIM Berhad, Malaysia reducing project execution time by 80% with LSDYNA software.
- Developed FEA methodology for simulating physical tests and fatigue calculations on aluminum alloy wheels, improving test correlation.

- Conducted CFD simulations to optimize industrial grinding wheel operations and enhance exhaust particle capture.
- Simulated high-speed boat propeller conditions using CFD and structural solvers, recommending design changes for longer propeller life.
- Performed FEA on an industrial welding machine, driving design changes and cost savings of \$200k for DENSO, Japan.
- Delivered lectures on optimization and DOE studies using FEA tools at KMUTT and KU universities in Thailand.

Designspokes Software and Services Pvt., Ltd.

Manager CAE Services | April 2009 – March 2011 (India) | 2 years

- Successfully delivered over 30 projects (FEA and CFD) in quick multiple sprints, involving critical design requirements, high-end virtual analysis, prototype building, observations incorporation, and final design suggestions.
- Conducted simulations on heat exchangers using ANSYS software, developing APDL code for FEA thermal stress calculations.
- Played a key role in selling and marketing Siemens NX CAE products, achieving success in a startup with pioneers in CAE technology.
- Conducted pre-sales demos, showcasing product versatility and necessity for customer needs, resulting in shorter sales cycles and customer satisfaction.

Caterpillar Inc., USA (through Tech Mahindra Ltd)

Senior CAE Engineer | January 2008 – March 2009 (India) | 1 year

- Optimized design processes and provided solutions for critical production issues at Caterpillar Inc.
- Successfully implemented over 5 high-quality CAE projects for Caterpillar Inc.

Ashok Leyland Ltd.

Senior CAE Engineer | March 2005 – December 2007 (India) | 2.5 years

- Led a highly motivated team of CAE engineers, providing expertise in FEA modeling strategies and simulation techniques.
- Conducted roof crush and frontal impact simulations on a military truck, correlating results with actual testing to expedite design approval processes using LSDYNA and Hyperworks.
- Contributed to various CAE and CFD projects for heavy and medium-duty trucks and buses.
- Completed high-end CAE projects, including fracture propagation and fatigue life assessment of a Pelton turbine for BHEL Bhopal.

Bosch Ltd.

FEA Analyst | April 2004 – January 2005 (India) | 9 months

- Gained extensive knowledge on FEA software tools and Implementation of knowledge-based technology in CAE analysis.
- Performed various Finite Element Analysis simulations on Automotive Fuel injectors using software tools like ANSYS and Altair Hyperworks.

Education

- Master of Science (M.S), Structural Mechanics | Blekinge University (Sweden) | 2002-2004
- Bachelor of Engineering (B. E), Mechanical Engineering | Andhra University (India) | 1997-2001

Technical Writeup, Patent & Recognitions

- US Patent (Pending): Vehicle fuel storage mounting system (Patent number: 12145435).
- SAE Technical Paper 2020 'Vector Load Simplified Duty Cycle for Lower Control Arm' ISSN: 0148-7191, e- ISSN: 2688-3627.
- Awarded for best sales performance for the year 2015 by Altair Inc.
- Awarded as 'Best Technical Performance partner' for the year 2013-2014 from Altair Inc.
- Recognized as 'Best Channel Partner of Altair Hyperworks' in ASEAN region for the year 2012-2013.

Software Tools

- Abaqus, Ansys, Hyperworks, nCode, Nastran, Optistruct, Radioss, LSDyna, Ansys-APDL, TCL/Tk, Matlab