Vishnu Rengaraj

Hawthorne, CA | 248-884-7729 | vishnurengaraj2287@gmail.com
rengaraj.com | Linkedin.com/in/vishnu-rengaraj

EDUCATION

University of Michigan, Ann Arbor, MI

M.S.E. Mechanical Engineering **(GPA: 4.00/4.00)** *September 2020 - April 2021*

B.S.E. Mechanical Engineering **(GPA: 3.83/4.00)** *September 2016 - April 2020*

↳ *Minor: Computer Science*

Coursework: Fracture Mechanics • Continuum Mechanics • Finite Element Method • Behaviors of Materials • Controls • Dynamics • Statics • Fluids • Heat Transfer • Thermodynamics **-•-** Machine Learning • Computer Vision • Data Structures and Algorithms • Robotics Lab (*SLAM + Kinematics*)

EXPERIENCE

SpaceX, Hawthrone, CA June *2020 - Present*

- **Development Test Engineer II** - design novel test equipment for quick and accurate aerospace qualification
  - Satellite Deployment Mechanism Qualification
    - Built custom DAQ and control computer to run flight software directly on hardware: Linux machine running Python automation via NI cards and relay boards
    - Qualified full suite of systems: pnuematics, structures, mechanisms, electronics, and software
    - Identified design issues such as excessive current draw from chain tension, incorrect transition in fight software, inaccuracy in potentiometer telemetry, piston stick-slip conditions, and more
  - Fueling Quick Disconnect (QD) Misalignment Testing
    - Designed fixture with 6 DoF Stewart platform to induce any arbitrary angular and translational offsets between mating QDs to test alignment capabilities
    - Wrote custom automation for test stand in flight control code: platform inverse kinematics, hydraulic servo control, gradient decent force control, and safety aborts
  - Elliptical Dome Burst Test
    - Filled test tank with 500,000L of LN2 and pressurized tank with GN2 until rupture to validate, and correlate, failure mode and region
    - Coordinated with civil, GSE, legal, telecom/IT, and analysis departments to conduct test as a pathfinder for new test facility
  - FAA Bird Strike Testing, *Internship*
    - Designed, manufactured, and tested 25 ft. long high pressure gas cannon for antenna bird impact testing
    - Created detailed fluids physics model in Python based on flow fundamentals
    - Ran LS-DYNA explicit bird impact analysis to assess test fixture boundary conditions, and scripted automation to run impacts at different angles and velocities

PROJECTS

Michigan Baja SAE, Ann Arbor, MI *September 2016 - May 2020*

- **Testing & Validation Director**, Suspension and Chassis Lead (2017-2020)
  - Collected testing data via strain gauges, Hall effect sensors, potentiometers, and accelerometers
  - Implemented implicit linear static and non-linear quasi-static simulations for stiffness and strain calculations
  - Introduced topology optimization reducing transmission rotational inertia by 30% and overall weight by ~8lbs
  - Simulated full vehicle crash with optimization via RADIOSS and OptiStruct to design safer roll cage
  - Validated simulations by conducted Instron testing and correlating results to simulations

SKILLS

HyperWorks/Ansys • OptiStruct/RADIOSS/Nastran/Abaqus/LS-DYNA • GD&T (FT&A) • Siemens NX/CATIA V5
CNC Mill/Lathe • C/C++/Python/MATLAB • PyTorch/TensorFlow/NumPy/OpenCV/SciPy