Tyler Kiefer

website:
tylerkiefer.com

Skills

- Kinematic Design
- Systems Design
- Finite Element Analysis
- Lithium Battery Module & Enclosure Design
- Design for Machinability & Manufacturing
- Belt Drive Design
- CAD Modeling
- ASME Y14.5 GD&T
- Part Design:
  - Sheet Metal
  - Machined
  - Weldment
  - Casting
  - Molded Plastic

Programming Languages:

- Python
- C
- HTML/CSS
- Javascript

Computer Software:

- Solidworks
- Creo (Pro/E)
- OnShape
- Altair

Education

Michigan Technological University — Houghton, MI
Bachelor of Science in Mechanical Engineering — *2010*

Active member of **SAE Aerospace Design** club. Competed with universities across the country and world to design and build a remote airplane to lift and successfully land with the most amount of payload weight.

- Regularly finished top 10 out of ~45 universities, including a 1st place finish.

Engineering Experience

Kiefer Engineering, Inc. — Colorado Springs, CO
Owner / Engineer — *Feb 2022 – Present*

- Consulted for multiple clients on wide range of projects from lithium battery systems to heavy agricultural machinery.
- Managed project timelines and set goals to ensure milestone dates were met.
- Led team of engineers across multiple consecutive projects and coordinated effort to complete projects successfully.
- Designed manufacturing plan for new Lithium battery module, as well as made improvements to module design.
- Wrote Python code to simulate articulation of boom arms and suspension height on autonomous agricultural sprayer machine.
- Improved C code for BMS of solar storage lithium battery solution to reduce memory footprint for embedded system controller.
- Designed 2nd revision of Lithium battery inverter enclosure to reduce cost and improve sealing.

Stewart & Stevenson (formerly Voltabox) — Austin, TX
Senior Mechanical Engineer — *Jan 2020 – Feb 2022*

- Led mechanical design of 24 kWh Lithium battery system for commercial vehicle.
  - Successfully packaged modules, electrical chassis, and inverters into small space allowance and routed HV and signal wiring.
  - Achieved manufacturing friendly design that met IP (ingress protection) rating goals.
- Designed new 4 kWh 16s2p prismatic Lithium battery module with goal of reducing weight and module cost.
  - Conducted FEA to confirm calculated stresses for EOL cell expansion reaction at module end caps and tension members.
  - Successfully built prototypes and testing setup. Progressed design into production runs.
- Collaborated on design of 10,000 V / 2,880 kWh Lithium battery mobile power trailer for off-grid oil well duty.
  - Led mechanical design of module mounting to cooling plate.
  - Calculated cooling requirements for chilled fluid cooling system and designed cooling plates to meet requirements.
  - Conducted full FEA of static, modal, and dynamic load cases of module racks.
  - Provided insight to reduce cost on module rack by allowing for simpler parts with greater tolerance allowance.
- Created novel method for handling and installing battery modules.
- Designed and conducted FEA of articulating lifting structure to move 5000 lb Lithium battery system.

- Worked closely with Project Management to lead project through concept, prototype, testing, and production phases.
- Collaborated to diagnose and solve laser welding issues on battery cell tabs.
  - Utilized FLIR imaging to verify cell tab to busbar weld quality during NHR high current module test.
- Worked with electrical engineering team to diagnose and resolve high-pot test issues due to manufacturer defects from cell supplier.
- Improved effectiveness and safety of laser weld mask for pouch cell module. Achieved increased consistency of welds across module.
- Organized UN 38.3 standard testing plan and collaborated with testing house:
  - Designed vibration test mounting components to test Lithium battery system to standard vibration specifications.
- Routinely modeled and created GD&T drawings; checked and released peer drawings.
- Designed, machined, and built weld mask prototype for cylindrical cell UPS Lithium battery pack.
- Created FMEA and led team review of analysis to determine failure risk factors of lithium battery module and enclosures.

DJH Engineering Center, Inc — Salt Lake City, UT
Mechanical Design Engineer — *2012 – December 2019*

- Collaborated directly with John Deere on ground-up designs for combine harvesters, cotton harvesters, and large tractors. Accountable for full design of critical systems and functional areas.
- Responsible for design from ground-up concept, through prototype builds, testing, and into production.
- Utilized FEA to optimize material weight and stress paths and improve mechanical properties.
- Managed teams of 8+ modelers to efficiently bring projects from concept to CAD models and GD&T drawings.
- Taught internal class on drive belt implementation.
- Commended for my contributions to DJH Engineering winning the prestigious John Deere Supplier of the Year Award four times during my tenure.

  S430/S440 Combine
  - Developed a belt drive system containing twelve belts to drive all functional components of the combine.
  - Performed kinematic analysis to optimize feeder house cylinder size and location.
  - Designed crop separator rotor system to isolate seed and grain from crop efficiently.
  - Created grain tank fill auger and unload auger systems.
    - Performed kinematic analysis to size the hydraulic cylinder as required to extend/retract the unload auger.

  X9 Twin Rotor Combine
  - Generated position sensor transfer functions for all three moving structures of the feeder house.
  - Selected to be on urgent task force to improve cooling package debris mitigation and engine cooling as performance issues were found late in testing.

  9R Tractor
  - Worked with engine team to design cooling package and layout of hose routing to radiators.
  - Designed aesthetic rotational molded plastic air intake stack.

Lynntech, Inc. — College Station, TX
Product Development Engineer — *2010 – 2012*

- Machined, assembled, and tested high-tech, 140 cell, 30 kW, fuel cell stacks.
- Routinely designed, created GD&T drawings, and machined parts with quick turn-around times.
- Collaborated on proposals for U.S. DoD and DoT contracts.
- Designed microflow sensor chamber for a DoD project.
  - Designed and built test equipment for GPS aware FLIR locating system for a DoD project.
  - Programmed and operated Bridgeport CNC mill during 6 month assignment in machine shop.