

# 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

GD&T Drawings

Part Design:

- Sheet Metal
- Machined
- Weldment
- Casting
- Molded Plastic

Programming Languages:

- Python
- C
- HTML/CSS
- Javascript

Computer Software:

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

## Education

Michigan Technological University  
**Bachelor of Science in Mechanical Engineering**

Houghton, MI  
2010

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

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

## Engineering Experience

Kiefer Engineering, Inc.  
**Owner / Engineer**

Colorado Springs, CO  
*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 8 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 2<sup>nd</sup> revision of Lithium battery inverter enclosure to reduce cost and improve sealing.

Stewart & Stevenson (formerly Voltabox)  
**Senior Mechanical Engineer**

Austin, TX  
*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.
  - Achieved manufacturing friendly design that met IP (ingress protection) rating goal.
- 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.
- 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.
  - Designed and conducted FEA of articulating lifting structure to move 5000 lb Lithium battery system.
- 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.
- Created novel method for handling and installing battery modules.
- 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  
Mechanical Design Engineer

Salt Lake City, UT  
2012 – December 2019

- Collaborated directly with John Deere on ground-up designs for combine harvesters, cotton harvesters, and large tractors.
- 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.  
Product Development Engineer

College Station, TX  
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.