

Sam Chandler

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EDUCATION

University of North Carolina at Charlotte, Charlotte, NC

Bachelor of Science in Mechanical Engineering

Spring 2026

Concentration: Motorsports Engineering

PROGRESS/RELATED COURSEWORK

- **Cumulative GPA (3.38)**
- Road Vehicle Dynamics, Advanced Road Vehicle Dynamics, Applied Road Vehicle Aerodynamics
- Battery Performance & Testing
- Machine Analysis & Design

SKILLS

TECHNICAL

- Creo Parametric (Proficient), SolidWorks (Proficient), Autodesk Fusion 360 (Proficient)
- Altair Inspire (Proficient), ANSYS Mechanical (Proficient)
- MoTeC i2 Pro (In-Training), MoTeC M1 Tune (In-Training)
- Star CCM+ (In Training), Dymola (In Training)
- MATLAB (Proficient), Python (In Training)
- Geometric Dimensioning & Tolerancing (Proficient)
- Microsoft Office Software (Proficient)

PROJECTS

Junior Design Team Member, UNC Charlotte, Charlotte, NC

January 2025 – May 2025

- Within a six-person team, designed and analyzed a belt-driven rotary axis base for a pick and place (PAP) robotic arm that incorporated custom designed pulleys, thrust bearings interfaces, as well an idler tensioner arm for consistent smooth motion. PAP robot was required to autonomously and manually sort and stack colored blocks within specified coordinates. Modeling of kinematic/inverse movements was performed to ensure proper component sizing and range of movement as well as holding torque calculations for the NEMA 17 stepper powered rotary base to verify precise positioning and repeatable movement. Presented the system design to peers, professors, and industry professionals to showcase system functionality and validate engineering decisions.

Drivetrain Chain Force Model, 49ers Racing EV, Charlotte, NC

October 2025 – January 2026

- Within MATLAB, developed chain force models to quantify motor torque, chain tension, chain drive geometry, and mounting/bearing resultant loads. Script considers various sprocket orientations and solves exponential tooth forces individually as well.

FSAE EV Acceleration Model, 49ers Racing EV, Charlotte, NC

October 2025 – January 2026

- Developed quasi steady state straight-line acceleration model in MATLAB to evaluate and optimize the longitudinal performance of a Formula SAE Electric Vehicle under real operating constraints. The model predicts vehicle acceleration, velocity, tractive force, lap time, etc. over 75m by coupling the electric motor (EMRAX 228) torque speed characteristics with drivetrain, battery, and vehicle dynamics (simplified MF5.2 tire model) effects incorporated into the model for optimizing drivetrain parameters.

ENGINEERING EXPERIENCES

Engineering Intern, Curtiss-Wright, Charlotte, NC

May 2025 – August 2025

- Designed and applied additive manufacturing tolerance analysis (GD&T), material behavior, and retention features to durable 3D printed fixtures used in high velocity shot peening environments while meeting customer drawing requirements. Masking and coverage features to protect critical surfaces of the part and ensure certain standard shot peening compliances with required overspray boundaries and limits.
- Collaborated with manufacturing and quality teams to reduce setup time, improve repeatability, and increase tooling reliability for recurring production jobs.
- Developed MATLAB and Excel built cost, efficiency, and ROI tools for additive manufacturing decisions, while supporting operations of the facility through UHMW machining, industrial equipment maintenance, and 3D printing system troubleshooting (Firmware, Hardware, PID Tuning).

Mechanical Powertrain Team Lead, 49ers Racing EV, Charlotte, NC

October 2024 – Present

- Lead the design and development of the 25'-26' drivetrain subsystem, guiding the full design cycle while mentoring subteam members and coordinating with suspension, chassis, and electrical subsystems.
- Designed custom chain drive and powertrain components including integrated motor-differential mounts, eccentric chain-tensioning carriers, sprocket adapters, stator spacers, shields, and motor guards with a focus on serviceability and repeatability.

- Performed structural analysis in ANSYS Mechanical, including static (dynamic impulse), modal, harmonic, and fatigue studies, to evaluate powertrain mounting stiffness and component behavior under vehicle loading conditions. Developed parametric CAD models using embedded MATLAB scripts in SolidWorks for eccentric chain-tensioning geometry tied to suspension layout and axle misalignment.
- Utilized MoTeC and BMS (Battery Management System) software during testing of 25' car for understanding vehicle characteristics and troubleshooting various functions/components of an electric vehicle.

Mechanical Powertrain Design Team Member, 49ers Racing EV, Charlotte, NC

October 2024 – June 2025

- Designed and packaged a single-rear motor chain drive powertrain using an EMRAX 228 motor and Drexler limited slip differential, collaborating with team members to integrate with chassis, suspension, and electrical subsystems. Also applied GD&T and manufacturing principles through rapid prototyping, fixturing, sheet metal fabrication, and precision machining of bearing fits.
- Designed custom structural and accessory components including motor mounts, differential mounts, sprocket adapters, scatter shields, motor guards, and custom idler chain tensioners considering packaging, manufacturability, and serviceability.
- Validated drivetrain performance and durability through hand calculations (chain forces, acceleration loads, bearing sizing, design life) and FEA/topology optimization in Altair Inspire to appropriately size components while maintaining sufficient rigidity for repeated use. Developed MATLAB-based gear ratio and performance calculators to evaluate drivetrain packaging/sizing and motor operating conditions.

Chassis Design Team Member, 49ers Racing EV, Charlotte, NC

December 2023 – October 2024

- Designed custom welding table fixtures for the purpose of manufacturing a FSAE chassis space frame in SolidWorks for each orientation that the chassis was placed prior to welding for the most accurate representation of the 24' and 25' frame. Fixtures were 3D printed and implemented during the manufacturing of both frames.
- Participated in 2025 FSAE EV Chassis Design Cycle by utilizing SolidWorks and Altair Inspire to run introductory FEA torsional simulations for the purpose of testing different iterations of chassis models designed for overall improvement and understanding of tube space frame mechanics.

OTHER EXPERIENCE

Oil/Tire Technician, Old School Automotive & Tire, West Columbia, SC

May 2024 – August 2024

- Performed routine maintenance inspections, including oil changes, tire rotations, balancing, and repairs, as well as brake jobs, suspension inspections, and strut/shock installations. Completed minor welding repairs and worked in a team environment to meet tight deadlines, ensuring vehicle safety and performance through efficient and detailed mechanical inspections.