Grace Yu

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Education

Rensselaer Polytechnic Institute, Troy, NY Expected Graduation Date: December 2026

Bachelor of Science in Aeronautical and Mechanical Engineering, Dean's Honor List, GPA: 3.99.

- 2025 Summer Undergraduate Research Award, Rensselaer Leadership Award

Research

Modification, Modeling, and Control of an Off-Road Vehicle at the Limit of Grip Oct. 2024 to Present

- Led the platform research team to automate the throttle, steering, and brakes of the car, collected relevant data to conduct system identification, and integrated relevant sensors and electronics onto the car.
- Designed and manufactured many PCBs for power distribution and signal processing, filtering and spoofing. Integrated features that minimize noise and ill-effects from in-vehicle vibration and harshness.
- Designed the electronics and housing for a 24V, 150A power distribution system with intelligent temperature control, safety redundancy, and an integrated status panel.
- Modelled the low-level controllers and transfer functions. Used fundamental vehicle dynamics and kinematics to model the steering and braking systems and used testing data to model the throttle system.

Convergent Manufacturing of Ceramic-Metal Composites Apr. 2024 to Present

- High-voltage and power electronics lead on the research team developing a proprietary additive manufacturing method for ceramic-metal composites (under invention disclosure stage).
- Helped to design and implement a roller-based sintering apparatus that can withstand high pressure, temperature, voltage, and current concurrently. Designed machine parts using GD&T and DFM practices.
- Worked on a vacuum system to control the atmospheric conditions for multi-field assisted laser sintering.

CRC-3 Vertical-Takeoff Fixed-Wing Aircraft Dec. 2023 to Oct. 2024

- Used a combination of hand calculations, CFD, and FEA to determine the optimal rotor and wing geometries. Rapidly prototyped many versions of the wings using laser cutting, 3D printing, and CNC routing.
- Built a virtual physics model of the drone to simulate the behavior of the drone in quadcopter mode to aid the development of firmware architecture.

Student on the Beamline (Canadian Light Source, Synchrotron Accelerator) Mar. 2021 to Oct. 2024

- Experimentally assessed the impact of different (x-ray) exposure times at cryogenic and room temperature on Bovine Insulin proteins using the CMCF Bending-Magnet beamline.
- Presented at the 2024 CLS Annual User Conference on further simulation of protein reconstruction using PyMol and GROMACS using the original crystallography results collected in August 2022.

Extracurricular Experiences

Rensselaer Motorsport (Formula SAE, Student-Built Electric Racecar Team) Sept. 2023 to Present

Chassis-Suspension-Tires Lead (June 2024 - Present), Chassis-Suspension Manufacturing Lead (Dec.2023-Jun.2024)

- Led the design and manufacturing of chassis and suspension for RM28 (2024-2025) and RM29 (2025-2026).
- Combined iterative FEA with gradient-based optimization method for lightweighting of RM29's chassis. Reduced RM29's chassis weight by over 9lbs in comparison to RM28 while still achieving the torsional rigidity target.
- Practiced lightweighting while applying DFM and GD&T to create lightweight, easily manufacturable components such as rockers, wheel hubs, and centerlock wheel rims. Reduced RM29's unsprung weight by 10%.
- Combined trajectory optimization with steady state cornering analysis to optimize for suspension parameters such as dynamic toe progression

MANE Student Advisory Council (Rensselaer Polytechnic Institute) Jan. 2024 to Present

Student representative for the Department of Mechanical, Aerospace, and Nuclear Engineering

Society of Mechanical Engineers (Rensselaer Polytechnic Institute Chapter) Jan. 2025 to Present

Chapter board member and won the 2025 SME Digital Manufacturing Challenge as part of the chapter's team

Stride Adaptive Sports Nov. 2024 to Present

Volunteer ski coach and camp counsellor

Skills

Software: CAD (SolidWorks CSWA Certified), CAE (ANSYS Mechanical and Fluent, COMSOL), Programming (MATLAB, Simulink, Python, C++, ROS2, Java, PX4 for RTOS)

Additional Skills: GD&T, Numerical Methods, Control Systems Automation, Manufacturing (Welding, CNC, Certified Additive Manufacturing Technician by SME), Power Electronics, PCB Design, OSHA 10 Certified