Victor Dong

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Education

Northeastern University May 2027

Candidate for B.Eng. in Mechanical Engineering & Physics | **GPA:** 4.0

Honors: Physics Department Award for Undergraduate Scholastic Excellence (x2), Dean's List (x5), Tau Beta Pi Engineering Honor Society Member

Relevant Coursework: Fluid Mechanics, Measurements, System Analysis & Controls, Dynamics, Statics, Thermodynamics, Material Science, Mechanics of Materials, Electronics, Classical Dynamics, Modern Physics, Electricity & Magnetism I

Technical Skills

Engineering Software: SolidWorks, HSMWorks CAM, Fusion 360 (CAD/CAM), Microsoft Excel

Simulation & Analysis: Simulink, Simscape Multibody, SolidWorks FEA, ANSYS FEA, Fusion 360 FEA

Programming: MATLAB, Python, Arduino, Java, C++

Machining & Fabrication: CNC milling, manual lathe/mill, TIG welding, waterjet cutting, laser cutting (CO_2/fiber optic), SLA/FDM 3D printing

Professional Experience

Quadratic3D – Mechanical Engineer July – December 2025

- Designed a three-stage belt-driven linear actuator with kinematic mounting for repeatable precision positioning, integrating limit switches for homing and a passive electromagnetic lock to prevent motor overheating during holding
- Developed and manufactured a belt-driven mechanical linkage system, using a Python kinematic model to size the actuator while incorporating sealing, belt tensioning, and quick-disconnect electrical interfaces
- Derived pressure distributions from rotational dynamics and performed SolidWorks assembly FEA to evaluate glass structural limits under centrifugal loading, validating results through staged centrifuge testing up to 60 g
- Modeled heat transfer to design a space-constrained transparent multi-pane insulated enclosure, optimizing pane thickness, gas fill, emissivity coatings, and pane count to minimize thermal loss; manufactured and experimentally validated the design, achieving a 60% reduction in heat loss
- Developed precision optical subsystems to improve beam stability, integrating feedback-controlled alignment and environmental isolation to reduce disturbance sensitivity
- Generated CAM toolpaths in Fusion 360 and machined precision components on a Datron 3-axis CNC mill, verifying tolerances and fits through GD&T inspection using a Datron CMM

Engineering Experience

Northeastern Electric Racing – Head of Vehicle Simulation May 2025 – Present

- Led a 15-member simulation team responsible for developing a full-vehicle dynamics model used by suspension, aero, and powertrain subteams to guide design decisions for a Formula SAE race car
- Developed a high-fidelity multibody vehicle simulation in Simulink and Simscape Multibody modeling 33 rigid bodies and full suspension linkages to capture suspension kinematics, tire forces, steering dynamics, and load transfer
- Implemented physics-based models for tire dynamics, powertrain behavior, aerodynamic loads, and a closed-loop electronic driver control model to perform lap time simulations on representative track geometries
- Developing a driver-in-the-loop simulation framework coupling real-time driver inputs with vehicle dynamics models to evaluate driver interaction and prototype vehicle control algorithms including torque vectoring and ABS
- Optimized solver and model architecture to improve simulation runtime from ~1000:1 to 1:1, enabling rapid design iteration

Northeastern Electric Racing - Suspension Systems Lead May 2024 – May 2025

- Reduced suspension mass by 62% (110 lb → 41 lb) through structural optimization and lightweight component redesign while maintaining vehicle dynamics targets
- Designed suspension components to meet vehicle dynamics targets including CG height, KPI, caster, camber, and turning radius
- Designed welding fixtures to position 48 suspension mounting tabs on the chassis, controlling geometric tolerances critical to camber, KPI, and suspension kinematics
- Performed SolidWorks FEA on 49 components using iso-clipping to guide structural lightweighting and validate load paths
- Defined GD&T for suspension knuckles and hubs manufactured via CNC milling and turning to ensure proper assembly and suspension alignment

Sant'Anna University - Agricultural Robotics Researcher September – December 2023

- Designed a robotic probe in Fusion 360 to collect subsurface root structure data for agricultural modeling
- Collaborated with researchers to develop a 2-DOF robotic system with differential linear and rotational motion
- Designed for field deployment by integrating watertight seals, data retrieval systems, and solar-powered operation

Voron - FDM 3D Printer Engineer May – August 2023

- Designed an FDM 3D printer in Fusion 360 with differential CoreXY motion and a 4-motor Z gantry
- Implemented automatic bed leveling using a probing routine to generate a 3D bed mesh and compensate for thermal warping
- Integrated LCD touchscreen, MCU, and Raspberry Pi for real-time sensor visualization and remote print queue management; processed IMU data in Python to tune motor control algorithms