Zachary DeParle

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EDUCATION

Duke University, Pratt School of Engineering, Durham, NC.   Expected May 2024
- Bachelor of Science in Mechanical Engineering with a minor in Computer Science (GPA 3.5).
- Dean's list with distinction, Fall 2022 and Spring 2023.
- National Merit Scholar, New York Times Guild Scholar.

Relevant Coursework: Product Design, Capstone Design, Independent Design Study, Dynamics, Statics, Control Systems, Structural Properties of Solids, Fluid Mechanics, Data Structures and Algorithms, Physics (EM and Mechanics), Thermodynamics, Linear Algebra, Multivariable Calculus, Differential Equations, Probability/Statistics.

SKILLS

3D-CAD: Solidworks, Autodesk Fusion360, CATIA, Siemens NX, AutoCAD, Autodesk Inventor, nTopology.
Manufacturing: Additive Manufacturing (FDM, SLA, SLS), 3D Printing, Prototyping, CNC Machining, Casting, Laser Cutting, Injection Molding, Plastic and Sheet Metal Part Design, Geometric Dimensioning and Tolerancing (GD&T), Design for Manufacturability (DFM), Design for Assembly (DFA).
Analysis: Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), MATLAB, Python.
Project Management Skills: Cross-Functional Team Leadership/Communication/, Project Lifecycle Management.

RELEVANT EXPERIENCE

Tesla Motors, Manufacturing/Equipment Mechanical Engineer Intern, Fremont, CA.   May – August 2023
- Reduced equipment downtime by 2.16 hours monthly by designing and 3D printing ergonomic betafoam RFID-trigger and button tools for manufacturing associates.
- Drove a seven-figure investment in floor trucks by orchestrating a storage efficiency project for Model 3 painting process.
- Doubled Cybertruck parts manufacturing efficiency by engineering a custom parts rack, optimizing space utilization.
- Refined parts-rack CAD designs to enhance manufacturing precision and parts compatibility.
- Streamlined carrier system processes, delivering biweekly analytical reports to the engineering and management team, bolstering operational oversight.

General Motors, Manufacturing Mechanical Engineer Intern, Spring Hill, TN.   May – August 2022
- Engineered a protective cockpit installation shield for the Cadillac Lyriq EV, working with interdisciplinary teams and preventing annual damage costs estimated at $1.5 million.
- Developed production line procedures, yielding a 1% boost in plant electrical efficiency, and reducing production defects.

Oak Ridge National Laboratory (ORNL), Research Intern, Oak Ridge, TN.   June – August 2021
- Developed machine learning models to extract chemical properties data from chemical text sequences.
- Researched prediction of chemical properties of polymers using Summit, the world's leading Quantum supercomputer.

National Institutes of Health (NIH), Research Intern, Bethesda, MD.   January 2018 – February 2021
- Utilized CAD and 3D printing to house printed circuit board and transcutaneous electrical nerve stimulator for a functional electrical stimulation exoskeleton to improve the mobility and gait of children with cerebral palsy.

Gall Group Laboratory, Research Assistant, Durham, NC.   March 2021 – Present
- Employed advanced CAD modeling and 3D printing techniques to create "dog-bone" specimens of various lattice structures, porosities, and chemical compositions.
- Conducted extensive stress-strain testing and dynamic mechanical analysis on hundreds of dog bone specimens, ensuring structural integrity and material compliance.
- Applied machine learning algorithms in MATLAB to process complex data sets, accurately forecasting the durability and functional longevity of lattice structures for cartilage implant applications.

TECHNICAL PROJECTS

Zbike, Independent Study Project.   January – May 2023
- Conceptualized, developed, and executed the end-to-end creation of a high-performance electric bicycle.
- Devised and constructed tailored motor supports and pulleys, facilitating the motor's integration with the bike's drivetrain.
- Designed and executed the precise fabrication of specialized mounts and casings for essential electronic components: a speed controller, handlebar throttle actuator, microcontroller, and battery pack.

GearGuroo, Product Design Class Project.   August – December 2022
- Led the development of a complex bicycle gear recommendation system, employing machine learning from extensive data analysis, and integrated critical sensors for terrain and speed detection to refine gear shifting precision.
- Crafted an intuitive, touch-responsive display interface utilizing Nextion software, encased in a custom-fabricated mount featuring a collar clasp design for streamlined handlebar installation and enhanced rider usability.

DesignCell, Duracell; Master's Student Design Class Project.   August—December 2022
- Pioneered a high-value Duracell consultancy project, securing six-figure funding and leveraging 20+ years of R&D to develop a profitable power-centric design strategy, poised to generate over $1 billion in revenue through innovative energy solutions in medical, automotive, and consumer electronic markets.

Amazon, Robotics Project, Senior Capstone Design Class Project.   October 2023 – Present
- Details under NDA.