ANDREW ZHU

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EDUCATION

University of California, Berkeley   Expected May 2024
B.S. in Mechanical Engineering   GPA: 3.73
Minor in Electrical Engineering and Computer Science (EECS)   Generation Change Scholarship

EXPERIENCE

Solar Vehicle Racing (CalSol) @ Berkeley   *Fall 2021 – Ongoing*
- Simulated impact tests using ANSYS to successfully validate the composite monocoque catamaran chassis design.
- Manufactured carbon fiber aluminum honeycomb composite panels in house using vacuum bagging technique.
- Designed and validated a 13% lighter aluminum roll cage while satisfying space and strength (FOS) regulations.
- Manufacturing the roll cage in house using rotary and roll bending, welding, and heat treatment techniques.

Space Technology and Rocketry (S.T.A.R) @ Berkeley   *Fall 2021 - Ongoing*
- Worked on a two-stage rocket prototype that successfully separated midflight for the first time in Berkeley history.
- Calculated and validated bulkhead and U-bolt performance using SolidWorks FEA to pass CDR and PRR reviews.
- Redesigned Avionics Bays using CAD and CF-reinforced filament to be space efficient, accessible, and 11% lighter.
- Provided critical design suggestions to improve the lifespan of the spring based separation mechanism by 150%.

Software Developer Intern @ Mariner Finance LLC   *Summer 2021*
- Focused on the Business Intelligence aspect by using Power BI and SSRS for business analytics & reporting.
- Worked on database management using SQL and maintained existing reports and relationships to the database.
- Created a report pulling data from across databases to show usage rates and trends for all other company reports.

TECHNICAL PROJECTS

Mechatronics Design Course Project – "Porter" (Link)   *Fall Semester 2022*
- Created a suitcase carrying wheeled robot service that visually tracks and auto follows a user around in an airport.
- Calculated metrics for motor and load cell selection, axle and wheel sizing, and chain and bearing tensioning.
- Sourced materials across multiple vendors with lean manufacturing ideas to reduce projected costs by 12%.
- Custom designed a 100% reliable, passive-powered, lightweight, compliant suitcase gripping mechanism.
- Designed and validated a compact tank-drive chassis using SolidWorks FEA to reduce robot size by ~25%.

Science and Engineering of Cooking Course Project – "Shaker"   *Fall Semester 2022*
- Created a toaster-sized, voice activated, liquid emulsion shaker kitchen appliance for professional chefs.
- Designed a compact linkage system using planar mechanics to accurately emulate shaking motion and forces.
- Selected and manufactured raw materials using DFM and DFA to achieve a product priced under $80 MSRP.
- Designed intuitively using living hinges, LCD screens, pushbuttons and rotary encoders to impress users.

Introduction to Product Development Course Project – "G.A.R.B." *Summer Semester 2022*
- Created a smart trashcan that automatically detected and sealed full capacity trash bags for contactless disposal.
- Analyzed BOM costs using Analytical Hierarchical Process and Pugh matrices to market a 25% cheaper product.
- Designed and manufactured 50+ components using CAD, GD&T, laser cutting, FDM, sheet metal forming, and a detailed and adaptive 4-week Gantt Chart to manage lead time and successfully produce a design prototype.

Electronics for the IoT Course Project – "Rider's Guard" (Link) *Fall Semester 2021*
- Created a safety device for electric skateboards that incorporates a brake light and collision alert system.
- Programmed the brake light using IMU data, PWM, and custom interrupts to detect slowing speeds or braking.
- Adjusted the sensitivity of the brake light by performing an IMU calibration to achieve a 90% braking accuracy.
- Programmed the collision alert using MicroPython and IMU to detect "unusual inactivity" with 100% accuracy.

Man. and Design Communication Course Project – "Grabber Cane" (Link) *Summer Semester 2021*
- Created a height adjustable walking cane that also acts as an extended arm to grab small items off the ground.
- Designed, validated, and manufactured 15 components with 100% design for reliability using CAD, FEA, and FDM.
- Incorporated GD&T, table of fits, and design drawings to promote DFA and DFM and reduce overall lead time.

SKILLS

Theory:	Multi-Variable Calculus • Linear Algebra • IoT • Dynamics • Mechatronics • Material Failure
Designing:	SolidWorks • ANSYS • Inventor & Fusion • MS Office Suite • FEA • DFM • DFA
Manufacturing:	FDM, SLA • Laser Cutting • Soldering • GD&T • Tube Bending • Lathe & Mill
Programming:	MATLAB • Java • Arduino • SQL • Git • VSCode • IntelliJ • Power BI