Krishnaa Sudhir

Product Design Engineer
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Mechanical engineer with experience in full-cycle product design in automotive industry and translating user needs into validated, manufacturable products. Skilled in 3D CAD, prototype fabrication, DFM, human-centered design and cross-functional collaboration across design, manufacturing and electronics teams.

Education

University of California, Berkeley Expected May 2026
Master of Engineering, Mechanical Engineering (Specialization – Product Design)

Sri Sivasubramaniya Nadar College of Engineering (SSN), Chennai 2021 - 2025
Bachelor of Engineering, Mechanical Engineering

Core Skills

CAD & Simulation: CATIA V5, PTC Creo, OnShape, Fusion 360, SolidWorks | ANSYS FEA & Fluent CFD | MuJoCo
Manufacturing: Rapid prototyping (3D printing, SLA, FDM, CNC machining), casting, sheet metal, TIG welding | DFM / DFA
Mechatronics: Arduino, Raspberry Pi, IMU integration (MPU6050), motor control, Bluetooth (HC-05)
Programming: Python (embedded control, data analysis, game logic, NumPy, Pandas, SciPy), MATLAB, Arduino

Professional Experience

Product Design Engineer, AI-Driven Design Optimization | *UC Berkeley* Sep 2025 - Present
- Designed and prototyped a personalized assistive wearable, iterating on part geometry, material selection, and 3D printing parameters to satisfy functional design requirements.
- Ran MuJoCo physics simulations to validate design assumptions, reducing physical iteration cost in early-stage development.
- Developed structured test protocols to verify prototype performance against specifications across each build cycle.
- Integrated LLM-driven design reasoning with simulation workflows to accelerate mechanical parameter refinement for personalized devices.

Product Development Intern | *Royal Enfield Global Headquarters* Jun 2024 - Jul 2024
- Benchmarked competitor wheel designs across 5+ motorcycles, evaluating spoke vs. alloy wheels on strength, manufacturability, and DFM criteria, directly informing material and geometry targets for a new 350cc platform.
- Designed a 2.15" x 19" spoked front wheel rim from scratch in PTC Creo, progressing from IS 16192 / ETRTO standards through full 3D CAD, revolve, and sectioned detailing with 36-spoke and 9-valve-hole geometry.
- Observed all stages of Royal Enfield's product development lifecycle: market study, skeleton modelling, mule, EDM, alpha, beta, and pilot builds, gaining direct exposure to how design decisions translate from CAD to production.

Projects

Gamified Ultimate Ankle Rehabilitation Device - Medical Device 2025
- Designed a patient-facing ankle rehab device targeting 4 clinical movements (plantarflexion, dorsiflexion, adduction, abduction).
- Translated physical therapist input and patient user needs into mechanical and functional design requirements.
- Built and debugged the electronics-to-software interface: connected IMU output through Arduino UNO to Python game logic, with real-time LED feedback confirming when motion thresholds were achieved.
- Tested across shoe sizes 5–11; all successfully triggered all directional motions, reporting increased motivation to do ROM exercises.

Automated Chess Piece for Navigation on a Chess Board – Electromechanical Navigation 2025
- Designed a compact self-propelled chess piece in CATIA V5 that houses two DC motors, an Arduino Nano, motor driver, and HC-05 Bluetooth module within the footprint of a standard queen piece - a highly constrained electromechanical packaging challenge.
- Owned hardware design end-to-end: laid out the electronics within the piece, defined motor mounting geometry, and routed wiring.
- Developed the path-planning algorithm for autonomous piece navigation on an 8×8 grid, using calibrated motor timing at uniform speed to translate square-count moves into repeatable physical displacement.
- Executed validation tests for positional accuracy; identified and resolved occasional diagonal-transition alignment issues.

Solar Dryer with Controllable Mirrors – Thermal and Structural Design 2024
- Created CATIA V5 3D models and assemblies of all structural components based on thermal and structural design calculations.
- Conducted ANSYS structural and thermal FEA on the dryer; used simulation results to drive geometry changes before fabrication.
- Designed and integrated an Arduino-controlled mirror actuation system using DC motors and an L298N driver, enabling Bluetooth-commanded (HC-05) mirror angle adjustment to maximize solar input.
- Reduced drying time by over 4x versus a fixed mirror configuration in comparative banana-slice testing.

Rockabye Baby Blanket – Portable Blanket for Baby Rocking 2025
- Developed an electro-mechanical consumer product using pneumatic actuation, Arduino-based control, and embedded timing logic.
- Implemented control systems to regulate actuation and rocking motion, translating control signals into consistent mechanical output.
- Tested the full system with a weighted baby doll (2lbs), successfully validating hands-free rocking motion and safety.

Parametric Study on a Two-Stage Evaporative Cooler – Thermal Systems Design 2025

- Developed a physics-based numerical model in MATLAB to analyze heat and mass transfer in direct and indirect evaporative cooling stages under varying airflow conditions.
- Designed and fabricated a working two-stage evaporative cooler and conducted controlled experiments to validate performance.
- Compared MATLAB numerical predictions with experimental results to identify optimal operating parameters and quantify performance improvements.

Certificates

Master's Certificate in Product Design and Analysis | *CADD Center* 2024
160-hour training on CATIA, ANSYS Essentials, and ANSYS Fluent.

Practical Training on Motorcycle Engines | *Goodwin Motors* 2023
Hands-on training on motorcycle engine assembly.

Leadership Experience

Affinity Group Leader – Inclusive Technology | *UC Berkeley Fung Institute* Aug 2025 – Present

- Co-leading a student affinity group focused on inclusive technology, driving awareness across the MEng community
- Co-authoring and publish a monthly newsletter on developments in accessible and inclusive design
- Organizing an inclusive design competition and hackathon for the broader Berkeley community

Student Placement Coordinator | *SSN Career Development Centre* Feb 2024 – May 2025

- Proactively reached out to recruiters and companies to drive participation in on-campus placement drives
- Held information sessions with alumni to support students with higher education and career preparation
- Served as a point of contact for student queries across placement processes and opportunities

Social Media Head | *Q! SSN Quiz Club* Jul 2024 – Mar 2025

- Managed the club's official Instagram account with a consistent content calendar of posts, reels, and stories
- Drafted and distributed invitations to regional quiz clubs to grow event participation and audience reach

Head of Documentation & Event Head | *SSN INVENTE 2024 (National-level tech fest)* Jul 2024 – Oct 2024

- Co-headed a team of 20 to organize Mechathlon, a mock-placement event for final-year students
- Co-edited Tech Vibe 2024, a technical magazine featuring contributions from 10 departments across SSN and SNU
- Maintained records of participants, winners, and prize disbursements across all Invente events

Junior Business Manager & Head of Partnerships | *AIESEC Youth Speak Forum 2024* Feb 2024 – Jul 2024

- Organized the Global Goals Impact Games (GGIG), a football tournament themed around UN SDG #3
- Served as Head of Partnerships for Youth Speak Forum 2024, engaging 4 entrepreneur speakers and 300+ attendees

Head of Finance | *SSN-SNUC Model United Nations (MUN) 2023* May 2023 – Jun 2024

- Managed end-to-end budget for a 3-day Model UN conference, overseeing all financial documentation
- Led a team of 3 in verifying financial documents and tracking expenses with receipts and cheque records
- Coordinated with Delegate Affairs, Logistics, and Sponsorship teams to align conference finances