

Yuxuan Chen

Structural Design & Multiphysics Simulation Engineer

📍 Yokohama, Japan | 🌐 chin-usen.pages.dev | ✉ chin_usen@outlook.com



Professional Summary

Mechanical design and multiphysics simulation engineer with experience in consumer electronics, automotive optics, and power electronics. Covers the product development cycle from structural concepts, 3D models, 2D drawings, and tolerance design to simulation, DFM, prototyping, testing, and design iteration. Experienced in precision structures, thermal and parasitic-inductance optimization, NPI process development, and root-cause analysis.

Core Skills

Mechanical Design: CATIA (proficient), Creo (proficient), SolidWorks, AutoCAD; part and assembly design, GD&T, tolerancing, materials and finishes, DFM, engineering drawings

Multiphysics Simulation: COMSOL; heat transfer, laminar flow, electric current and Joule heating, thermal stress, non-isothermal flow, material properties, contact thermal resistance, and boundary conditions

Power Modules & Electronics: Power module packaging; AMB, clip, terminal, busbar, pin-fin, and case; parasitic-inductance analysis with Rainbow Studio; prototype test PCBs with KiCad

Prototyping & Quality: Prototypes, fixtures and SOPs, supplier DFM and first-article inspection, DOE, PFMEA, Control Plans, 8D, root-cause analysis, and yield improvement

Professional Experience

Power Module Structural Design & Simulation Engineer | Power Electronics

May 2025 - Present

Japan

Designs structures, runs thermal, flow, and thermal-stress simulations, analyzes parasitic inductance, and develops prototypes for power modules used in EV and PV inverter applications.

- Developed structures for two power modules and supported two prototype builds. Designed chip layouts, AMBs, clips, terminals and pins, busbars, coolers, pin-fins, cases, PCBs, and assemblies in CATIA; released 50+ part and assembly drawings.
- Built coupled thermal, flow, electrical, and stress models in COMSOL and completed 10+ formal simulation cases; drove 100+ structural iterations based on simulation, DFM, fabrication, and test results.
- Used Rainbow Studio to break down power loops, identify high-inductance regions, and optimize busbars, clips, and chip layouts, balancing power density, parasitic inductance, and thermal resistance.
- Designed a prototype test PCB in KiCad, from schematic and component selection through layout, stack-up, and Gerber output; introduced four fixture sets and wrote assembly and prototype SOPs.
- Worked with suppliers on DFM, drawing updates, fabrication, first-article inspection, electrical and thermal-resistance testing, and issue closure; collaborated with engineering teams in China, Japan, and Korea.

NPI & Field Application Engineer | Automotive Optics

Jul 2023 - Apr 2025

China

Developed processes, introduced equipment and fixtures, supported customers, and improved quality for automotive lens products from EVT through DVT.

- Led major improvements in ghosting, MTF, and cosmetic yield, raising results from 80% to 95%, 60% to 80%, and 80% to 95%, respectively.
- Used part swaps, rotation tests, teardown analysis, and DOE to identify root causes including spacer interference and thickness variation, lens decenter and tilt, press-fit force, and adhesive volume; drove improvements in tolerances, structures, processes, and incoming inspection.
- Validated three improvement programs on approximately 50,000 lenses; completed two mass-production trial runs and shipped approximately 20,000 lenses, with trial yield broadly consistent with validation results.
- Planned processes from assembly through packaging and transport; prepared SOPs, Control Plans, PFMEAs, process flow diagrams, and 8D reports. Supported automated assembly machine acceptance, achieving 98% yield.
- Designed and introduced inspection, dispensing, and lens-assembly fixtures; completed packaging design and transport validation. Supported Japanese customer meetings, equipment reviews, and engineering documentation in Japanese.

Mechanical Design Engineer Intern | Consumer Electronics · Smartphones

Feb 2023 - Jun 2023

China

- Supported smartphone structural design and prototyping. Designed waterproof foam, adhesives, battery-cover components, and SIM trays in Creo; maintained PLM drawings and prepared teardown SOPs.
- Investigated PCB-mounted nut detachment by comparing OSP and ENIG finishes; the change to ENIG reduced defects from 32/100 to 0% in the validation batch.
- Ran a DOE on TP waterproof-foam width and closed four production or assembly issues involving coaxial-cable Mylar overhang, copper-foil assembly error-proofing, and automated material feeding.

Selected Projects

800 V 6-in-1 Three-Level Power Module | PV Inverter

- Independently designed core structures including the AMB layout, clips, terminals, busbars, and case; implemented the chip-layout and cooler CAD models after team discussion.
- Reduced long-loop inductance from 24 nH to 14 nH (approximately 42%) and short-loop inductance from 18 nH to 8 nH (approximately 56%) through stacked positive and negative busbars, field cancellation, and current-path optimization.
- Completed parasitic-inductance modeling, supplier DFM, prototype builds, and electrical-test follow-up; measured results followed simulation trends.

Compact Single-Phase SiC Half-Bridge Power Module | High-Power-Density Inverter

- Designed AMBs, clips, terminals, busbars, pin-fins, and case structures for a compact module of approximately 72 mm × 37 mm with eight SiC MOSFETs; ran thermal, flow, and parasitic-inductance simulations.
- Reduced parasitic inductance from approximately 7 nH to 3 nH and thermal resistance from approximately 0.15 K/W to below 0.10 K/W by shortening current loops, stacking busbars, and optimizing chip layout and cooling.
- Correlated simulations against prototype measurements; results met design targets and informed subsequent structural iterations.

Autonomous Navigation for a Quadruped Robot Using ZED-Based Object Recognition | Bachelor’s Project

- Used a ZED stereo camera for image, depth, and point-cloud data; combined HSV, morphology, edge, and circularity methods for object segmentation and calculated distance and yaw from 3D coordinates.
- Completed the software design independently and contributed to hardware debugging; achieved 95% distance-measurement accuracy and a mean yaw-angle error of 0.47° for object tracking and navigation.

Education

B.Eng. Nanchang University, Mechanical Design, Manufacturing and Automation

- First-Class Scholarship (1); Second-Class Scholarships (3)

China
Sep 2019 - Jun 2023

Languages & Certifications

Japanese: JLPT N2, 143/180 (2022); technical discussions, customer and supplier communication, and engineering documentation in a Japanese work environment

English: TOEFL iBT 100 (2022)

Leadership

Head, Student Organization Affairs Department | Nanchang University Student Organizations Center

Jun 2020 - Jun 2021

- Coordinated daily and special activities for 37 student organizations and delivered training for more than 80 student leaders.
- Organized student-organization recruitment that brought in 700+ members across 37 organizations and attracted more than 2,000 students.