Siyuan Cheng

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EDUCATION

Columbia University New York, United States
***Master of Science**, Mechanical Engineering, [GPA: 3.47/4.00]* Aug 2021 - Feb 2023
Courses: Advanced Manufacturing Processes, Advanced Mechanics of Fluids, MEMS Systems, MEMS Production and Packaging

University of Shanghai for Science and Technology Shanghai, China
***Bachelor of Engineering**, Energy and Power Engineering, [Major GPA: 3.77/4.00]* Sep 2017 - Jun 2021
Courses: Mechanics of Material, Mechanical Design, Thermodynamic, Measuring and Control Technology
Honors: First-class scholarship (2019, 2020, 2021), outstanding graduate (2021)

WORK EXPERIENCE

Huawei Technologies Co., Ltd - Mechanical Engineer Shanghai, China
4D Automotive Radar System Design Apr 2023 - Present

- Led the structural development of next-generation mass-production radar, including component and assembly design, 3D modeling, creation of engineering drawings, and tolerance analysis to ensure manufacturability.
- Optimized product EMC protection, heat dissipation, stacking, and material selection through structural design, leading to a patented solution that reduced component manufacturing costs by 75% compared to the previous generation.
- Developed simulation plans based on automotive industry standards and conducted static and dynamic structural analyses using Abaqus to evaluate and optimize product performance.
- Conducted supply chain MFG reviews and DOE experiments to identify potential failures. Improved product yield from 80% to 90+%.

Plastic Laser Transmission Welding (LTW) Process Research

- Designed and produced small-batch prototypes using 3D printing and simple molds for LTW process research, independently set up experimental environments to conduct mechanical tests on structural designs and plastic materials.
- Developed a 3D FEA contact model for laser transmission welding based on volumetric heat sources using ANSYS and conducted simulations and experimental studies on different interface contact conditions.
- Analyzed simulation and DOE experimental data. Used Minitab to determine optimal plastic injection molding and laser welding parameters, resulting in a 42% improvement in bond strength.

Optical system design

- Designed metal components for coupling optical lenses and laser emitters, reducing thermal backflow through structural optimization and minimizing thermal deformation impact on optical accuracy using powder metallurgy technology (MIMS).
- Conducted metallographic and EDS analysis on failed components to investigate the corrosion failure mechanism of MIMS coatings, developing improved electroplating techniques that enhanced corrosion resistance by 50%.
- Took charge of designing optical lenses for LiDAR, implemented glass toughening, machining, and PVD coating process improvements, and led multiple failure analyses of optical lenses.

ACADEMIC PROJECTS

Research on Fluid Mechanics of Micropumps New York, United States
Research Assistant Jan 2022 - Jun 2022

- Designed and modeled a compact piezoelectric micropump with dimensions of 25mm x 25mm x 5mm using SolidWorks.
- Conducted multi-condition coupled simulations using COMSOL to study the micropump's operating principles and fluid flow dynamics.
- Analyzed data to identify key factors of micropump and proposed practical methods to improve flow rate, finished a research paper.

MEMS Scanning Mirror Design New York, United States
Course Research Sep 2021 - Dec 2021

- Led a team to design a piezoelectric MEMS scanning mirror with a wider scanning angle, enabling more flexible beam control.
- Created a 3D model of the scanning mirror, performed structural simulations using ANSYS, and designed a feasible etching process.
- Optimized the MEMS scanning mirror design based on simulation results, achieving a scanning angle of up to 25°.

Analysis and Design of Microchannel Heat Sink Shanghai, China
Graduation project Dec 2020 - Jun 2021

- Designed a novel microchannel heat sink structure with a bionic fish-scale pattern to attain a heat dissipation efficiency of 100 W/cm².
- Conducted thermal simulations using ANSYS Fluent to study heat transfer and fluid flow mechanisms of single-phase water in microchannels, optimizing the structure to balance heat dissipation efficiency and pressure loss, outperforming traditional designs.

PUBLICATIONS

- Mechanism research on radiation in the phase transition of water. Energy Research and Information, 2021, 37(1): 40-45.

SKILLS

- Computer Aided Engineering: SolidWorks | PRO/E | AutoCAD | ANSA | Abaqus| ANSYS | COMSOL | Python 3.0 | MATLAB