# Elliot (Congyuan) Zhang

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## EDUCATION

**University of Pennsylvania** **Sep 2020 - May 2022**
*MS in Mechanical Engineering* (GPA**:** 3.66/4.0) Philadelphia, PA

**The Pennsylvania State University** **Aug 2016 - May 2020**
*BS in Mechanical Engineering* (GPA**:** 3.53/4.0), Minor in Engineering Mechanics University Park, PA

- Dean's List Academic Award
- Dassault Systèmes Certification for Mechanical Design – CSWA for SolidWorks

## PUBLICATION

Zhang, C., Yao, J., Zhang, C., Chen, X., Liu, J., & Zhang, Y. (2020). Electrochemical milling of narrow grooves with high aspect ratio using a tube electrode. *Journal of Materials Processing Technology*, *282*, 116695.

## PROFESSRIONAL EXPERIENCE

**Fuyao Automotive North America** **Plymouth, MI**
*Component Design & Development Engineer* Aug 2022 - Nov 2022

- Improved the stability of product quality and the performance of PBT injection molding production line with no error
- Successfully trained operators to have a good command of the PBT injection molding machines, common troubleshooting skills and knowledge to record the daily production report to system
- Developed and revise the essential documents for production line, such as process flow, PFMEA, control plan
- Performed troubleshooting and daily inspection for the mold and production line
- Address customer issues and support customers product audit
- Controlled the production schedule and quality and led the activities to ensure continuous improvement in process, products, equipment, and materials.

**McKay Orthopedic Research Lab, UPenn, Perelman School of Medicine** **Philadelphia, PA**
*Research Assistant Intern* May 2021 - Dec 2021

- Performed image analysis via Image J and MATLAB to determine the effect of pregnancy, lactation, and weaning on maternal bone on rats and generated quantitative data metrics to capture osteocytes parameters
- Conducted comprehensive research to collect comparative osteocytes data to understand morphological metric
- Resolved issues with polishing and sawing machine and ensured proper maintenance
- Saved costs for machine upgrade by applying sawing and polishing experience to obtaining non-scratch samples for micro-Computed Tomography(micro-CT)

**Mechanics and Materials Lab, Penn State** **University Park, PA**
*Undergraduate Research Assistant* Jan 2019 - Aug 2020

- Analyzed mechanical properties of human glenoid and mice tibia microstructures with atomic force microscope
- Determined mechanical properties of human glenoid and mice tibia in 3D for bone pressure by location, using digital volume correction (DVC), micro-Computed Tomography (micro-CT), and three-point bending
- Obtained high quality samples for AFM (Atomic Force Microscopy) by performing skillful hands-on work, including embedding, sawing, and polishing
- Built up a 3D model in CAD for knee joint to simulate contact stress after knee replacement implants
- Verified the Hertzian contact stress between knee and knee implants and these implants' influence of geometrical parameters on contact stress by utilizing COMSOL, 3D models for knee joint and FEA

- Ensured project timeliness by performing routine maintenance on different machines (sawing, polishing and 3-point bending machines) and troubleshooting issues
- Received scholarship funded by Dr. David and Mrs. Shirley Wormley

**Electro-mechanical Engineering Lab, GuangDong University of Technology** **Guangzhou, Guangdong**
*Research Assistant Intern* May 2018 - Aug 2018

- Performed tuning on Prof. Zhang's electrochemical machine through iterative unconventional manufacturing tests
- Conducted in-depth analysis on electrochemical reaction and examined impact of different levels of current and voltage on machining process
- Calculated feed speed and influencing factors of electrochemical milling under electrochemical processing theory
- Analyzed characteristics of flow fields in gaps between anode and cathode
- Performed preventive maintenance and provided technical support on electrochemical machines; identified optimal solutions to performance improvement
- Coauthored "Electrochemical milling of narrow grooves with high aspect ratio using a tube electrode"; Journal of Materials Processing Technology, 282, 116695

## PROJECT EXPERIENCE

**Innovative Trash Can Design** **Jan 2022 - May 2022**
- Designed a new trash can inspired by conventional products and e-skateboard by combining their functionalities
- Completed necessary steps in design for manufacturability (DFM), including customer needs, BOM, quality function deployment (QFD), product specification, cost estimation, and product structure
- Employed knowledge in additive manufacturing, production machining and materials (metal, elastomers, and plastics) to identified optimal and cost-effective materials and machine method for each part of new product
- Designed assembly structure for each part of improved trash can such as lid, bottom, and body by using CAD
- Modified product structure in CAD to meet requirements for injection molding
- Delivered expertise in field of mechatronics to fulfill requirements, including wireless control, autonomous navigation and motion sensitive sensor

**End-to-End Multifunctional Car Design** **Sep 2021 - Dec 2021**
- Designed car structure in CAD and soldered electric components to perfboard and laser-cut components for assembly
- Implemented core functionalities: wall following, wireless control, autonomous navigation, and location tracking
- Executed ADC function using Teensy to design a master-slave model and control motors to ESP 32 Pico kit
- Evaluated different wheels, motors, batteries, and caster bearing wheels to identify optimal parts for each component
- Constructed electric circuit diagrams for Vive signal receivers and frequency filters and compared their actual performance with theoretical performance
- Programmed in Arduino to facilitate connection from Vive and detect Beacon signal after filtering others frequency
- Placed number three in team competition of Grand Theft Autonomous

**Design of Valve Cleanup Device** **Jan 2020 - May 2020**
- Improved cleaning efficiency by 50% by designing a cleanup device for Washington Suburban Sanitary Commission
- Built up prototype with PVC pipes
- Facilitated requirement solicitation and needs assessment workshops to understand client's needs and expectations
- Performed computational fluid dynamics and venturi effect design, simulation, and evaluation in SolidWorks

## SKILLS

**Software:** SolidWorks, Python, C, MATLAB, COMSOL, MS Office, ANSYS, Image J, Avizo, Java
**Design:** Product and Mechanical Design, Prototyping, Hands-on, Finite Element Analysis, Data Analysis, DFM, GD&T
**Manufacturing:** 3D Printing, Milling, Drilling, Lathe, Laser Cutting, Troubleshooting
**Languages:** Mandarin, English, Cantonese