Bingyi Wang

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EDUCATION BACKGROUND

Beijing University of Chemical Technology   09/2020—12/2022

Bachelor of Engineering, Mechanical Design Manufacturing, and Automation

Courses: Robotics, Electrical & Computer Engineering, Signals & Systems, Mechanics of Materials, Machine Design, Automatic Control, Programmable Logic Controllers, Mechanism Design, Hydraulic & Pneumatic Transmission

University of Detroit Mercy   01/2023—06/2024

Bachelor of Engineering, Robotics and Mechatronic Systems Engineering

Core Curriculum: Fluid Mechanics, Computer-Aided Engineering, Hardware/Software Integration, Autonomous Mobility Robotics, Robotics & Mechatronics Systems Engineering Design, Sensors & Actuators, Thermodynamics

INTERNSHIP EXPERIENCE

Beijing Tinavi Medical Technologies Co., Ltd., Beijing   05/2023—08/2023

Hardware Engineer

- Participated in a project called PKP (Percutaneous Kyphoplasty) from Party A of the company, cooperated with colleagues to design a system using the computer to control the robotic arm to push a syringe to inject bone cement and contrast media, and my job was to design the injector model and assemble its prototype.
- Based on the previous patented syringe model, designed quick pressure relief device to exhaust the gas in the syringe, and devised quick disassembly device to ensure that the doctor could remove the injector immediately and finish the injection manually once the machine failed.
- Completed the syringe model design and simulation in CREO 3.0 and AutoCAD software, derived the most suitable parameters through gradual adjustment and simulation, used a laser 3D printer to generate the 3D model, and eventually purchased auxiliary accessories from the supplier to accomplish the injector assembling.
- The syringe was the first one on the market that could be equipped with quick disassembly and pressure relief devices simultaneously to inject bone cement and contrast media so it was granted a patent.

> 批注 [陈1]: 烦请炳毅看看我写的细节是否有误

> 批注 [陈2]: 等一下炳毅的专利号

RESEARCH & SEMINAR EXPERIENCE

Design of Hydraulic System of Single-leg Structure of Multi-legged Robot, Beijing   07/2023—08/2023

Supervised by Professor Zhiming Jin, Beijing University of Chemical Technology

- Designed a hydraulic manifold block in a 200*200 board in SolidWorks, and applied software to simulate the pressure of liquid flow to improve the block property with the consideration of other factors such as price.
- According to the maximum load and speed of different parts' cylinders, calculated appropriate cylinder diameter, maximum tolerable pressure, and flow rate.
- Carried out a comprehensive literature review on the selection of board materials in terms of factors such as liquid pressure, flow speed, and price, and found out which material best suits the cylinder parameters above.
- Used SolidWorks to simulate the pipeline structure with 5 valve blocks mounted on the board, drew the valve and assembly diagrams, and eventually ordered the prototypes of suitable valves online to complete assembly.

> 批注 [陈3]: 炳毅看看我写的是否准确，以及想问一下模拟压力的软件叫什么呀

Biologically Inspired Robotics, Beijing   06/2023—09/2023

Supervised by Professor Fumiya, University of Cambridge

- Attended the seminar to understand how to design a bionic robot by combining biology and robotics knowledge together and achieve the shortest trajectory planning by applying different sensors and search algorithms.
- Conducted a comprehensive literature review to understand the similarities between the sensor system in the robotic arm and the self-driving car's sensor system, thus led a team to design a sensor system with high precision and low consumption based on simulating a self-driving car in MATLAB.

- Used Robotics Playground Toolbox to build a car model, mounted two radar sensors, one lidar sensor, and one camera sensor on it to form a sensor system, and utilized design driving scenarios app to simulate two different kinds of road conditions so that testing the property of this sensor system.
- Repeatedly adjusted the positions of sensors and parameters, finally figured out the optimal sensor system that could be applied to the robotic arm with expected increased accuracy and lower energy consumption.

PROJECT EXPERIENCE

Mechanical Modelling & Design, Wrench Redesign, Detroit   01/2023—02/2023
- Redesigned a wrench in SolidWorks to withstand higher force whilst keeping the weight and length unchanged.
- Mounted ribbed plates onto two sides of the wrench to enhance the ability to support higher stress whilst punching symmetrical holes on the wrench body to keep the same weight, used FEA tests to verify the results.
- Alloy steel was selected as the new material to undertake more force due to its larger yield strength than the existing wrench which increased the maximum stress by 108% and 279% for two ends respectively in FEA tests.

Mechanical Modelling & Design, Thermal Cup, Detroit   02/2023—03/2023
- Designed and built a thermal cup model in SolidWorks, and defined parameters to simulate its heat dissipation.
- Reviewed the literature to devise a double-layer cup, selected gases such as air and carbon dioxide as the medium of heat insulation between two layers due to their lower thermal conductivity and cost than other normal mediums.
- Selected glass as the material of the cup so that observing the water volume directly, established the 3D model of the cup lid, liner, and outer casing, and assembled them together.
- Defined thermal conductivities for each type of material, initial temperature for water and environmental air, and heat transfer coefficient between each two materials in Thermal Part in SolidWorks.
- Simulated the temperature trend of 130°F water stored in the cup in a 30°F environment, the water temperature was found to decrease to 60°F after 4 hours and this result certified the insulation property.

EXTRACURRICULAR ACTIVITIES/CONTEST

Martial Arts Club, Beijing University of Chemical Technology   10/2021—07/2022
- Acted as the president of the club, and organized weekly training and on-campus activities.
- On behalf of the club, participated in the Sanda competition for university students in Beijing.

APMCM Asia and Pacific Mathematical Contest in Modeling   November/28/2022
- Led a team to attend this competition, communicated with the instructor, and distributed tasks to team members.
- Plotted the trend of temperature from 1750 to 2011 in Excel, by calculating mean value and standard deviation, and applied Excel to predict the tendency of temperature in 2050 and 2100.

> 批注 [陈4]: 想问一下数学建模除了 Excel 还有用到其他软件吗

SKILLS

- Language: IELTS, CET 4, CET 6, Chinese (Mandarin)
- Programming: C++, Python, ROS (Robot Operating System)
- Software: SolidWorks (CSWA Certificate), AutoCAD, CREO, MATLAB