ZHANG, Dingzhong

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EDUCATION

Shanghai Jiaotong University (SJTU) 09/2019-06/2020

M.Sc. in Mechanical Engineering, ended in Jun 2020

- **Overall GPA:** 3.52/4.0
- **Academic Excellence Scholarship** of SJTU from 2019

Shanghai University (SHU) 09/2014-06/2019

B.Eng. in Mechanical Engineering, graduated in Jun 2019

- **Overall GPA:** 3.72/4.0 **RANK:** 1/277
- **Academic Scholarship** of SHU from 2015-2018

- **Test Scores:** IELTS 7.0 (R8.0 /L8.0 /S5.5 /W6.5)｜GRE 317 (V147/Q170) + W3.5｜French B1.3 (CEFR)
- **Relevant Coursework: Distinction** in Modern Control Theory, Advanced Biomedical Image Processing, Micro-computer Concept and Application, The Innovation Practice of Mechatronics System

RESEARCH EXPERIENCE

Orbital Rim Registration Software 12/2019-present

Master Projects, Supervisor: Dr. Xiaojun Chen

- 3d reconstruction 用数个病人的 dicom 三维重建颅骨部分，保存为 stl
- 使用改良的 icp 配准方法，做三维的选点配准
- **做了一个软件，便于医生操作，可以让多个模型三维配准并且保存变换矩阵和选点的数据**

Medical Image Segmentation using Tensorflow C++ API 09/2019-11/2019

Master Projects, Supervisor: Dr. Xiaojun Chen

- Labelled 给 CT 图片做标注，并且用 unet 训练二维和三维的模型
- Trained a model based on U-net and
- **查询 tensorflow 的 c++ api 手册，让 python 的程序适用于 c++平台的软件开发**

Biomechanical Analysis of Knee-Joint Prosthesis 03/2018-07/2019

Final Year Project, Orthotek Lab, Supervisor: Dr. Zikai Hua

- Utilized an ABB IRB6700 robotic arm to simulate physiological loading conditions and to perform kinematic (normal walking) test on a human knee-joint prosthesis.
- Planned robot path according to anterior-posterior translation, medial-lateral rotation, flexion-extension rotation of knee-joint in MATLAB Robotic Toolbox and programmed in RobotStudio.
- Controlled and detected physiological loading by using a multidimensional force sensor, Beckhoff embedded PC, and secondary developed software based on TwinCat.
- Designed new fixtures, including a flange, an adapter flange, trapezoidal grooves, and two barrels for PMMA solidification for linking knee-joint prosthesis with robotic arm.
- Established a dynamic optical measuring system to observe knee-joint kinematics in gait after collecting data from ARAMIS, GOM by sticking markers on the surface of prosthesis.

~~**Optimization of Baxter – A Cobot made by rethink** 06/2018-08/2018~~

~~*Research Assistant in Visual Interaction Group, Supervisor: Dr. Long Li*~~

- ~~Improved the response speed of Baxter when imitating human's action by path replanning in Moveit!, based on ROS system.~~
- ~~Redesigned the mechanical structure of the gripper to grab objects of various shapes and texture.~~
- ~~Successfully guided the robot to pick up a delicate wineglass and finish the water-pouring movement.~~
- ~~Empirically adjusted the gripping pressure to objects in different shapes, weight, and surface texture.~~

Design of A Medical Rehabilitation Robotic Arm 01/2018-06/2018

Third Year Project, First Prize in Chinese Service Robot Competition (Innovative design of rehabilitation robot) 2018, Supervisor: Dr. Bin He

- Designed a prototype of four DOF robotic arm, which can predict patient's arm movement and help do rehabilitation exercises.
- Developed an integrated system of a robotic arm, a multiple sensor, a windows forms application programmed in c#, a servos' control system in Arduino where messages are detected and exchanged through the serial communication ports.

- Deduced an empirical formula of the multiple sensor - Leap Motion to control four servos with detected coordinate points after many attempts.
- Set a parameter to regulate the sensitivity of the robotic arm for different patients.
- Simulated and conducted force analysis in Ansys under various situations.

A Novel FPV Racing Drone 05/2018-06/2018

One of Two Team members, First Prize in China Aerial Robotics Competition 2018, Supervisor: Dr. Di Wang

- Built an FPV with 4 brushless motors (4800kv) with 3-leaf propellers on each, a carbon fiber frame, 4 in 1 ESCs, F3 flight controller, and the altimeter, barometer, video transmitter, etc. on boards.
- Tuned the PID to make the drone both steady and agile for the match.
- 3D-printed a knife rest for a ceramic blade to penetrate several balloons on the game day.

Programming and Design of a PCB Layout of an AGV 11/2017-03/2018

Team leader, Third Prize in China Robot Match (Travel and Security) 2018, Supervisor: Dr. Di Wang

- Programmed the vehicle for passing through different kinds of terrain and make corresponding actions (driven by four servos) after scanning QR codes.
- Designed and soldered an expansion PCB to be set on the STM32 for improving the reliability instead of connecting different parts with Dupont cables.
- Added an automatic steering system by installing 16 gray-scale sensors, 4 ultrasonic sensors and optimized the algorithm to have a quick response.

COURSEWORK PROJECTS

Analysis of handling response and stability based on a 2-dof single-track model Fall 2019

Coursework: Vehicle System Dynamics

- Established a basic handling model of two vehicles on Simulink.
- Compared the steer angle, the lateral velocity and acceleration both in time domain and root locus.
- Designed a simple 4-wheel steering controller and analysis lateral velocity and acceleration.

Assembling an AM Radio Summer 2017

Coursework: Electronic Training

- Soldered all the electronic components on the given printed circuit board according to the schematic.
- Examined with an AVO meter to prevent a short circuit.
- Tuned the radio by adjusting the intermediate frequency (IF) to 465kHZ and adapting the IF range to 535~1600kHZ.

Design of a Lathe Reducer Summer 2016

Coursework: Mechanical Design

- Designed and drew the layouts of a reducer which can reduce rotating speed from the electric motor.
- Calculated the parameters of two gears and the gear box size to make sure there would be no interference according to the requirement of the reducer performance.
- Figured out the tolerance of the shaft and decided where to use clearance fit or interference fit.

Metal Shaft Making with CNC Machine Summer 2015

Coursework: Metalworking Practice

- Operated a lathe & CNC machine to turn a metal shaft and wrote CNC machine code.
- Finished the metal shaft with almost no deviation from the design drawings.

OTHER SKILLS

- Programming: C#, C++, Python, Visio Studio, QT
- Medical Image Computation: Tensorflow, VTK, ITK, OpenCV, Mimics, 3D Slicer
- Robotics: MATLAB Robotic Toolbox, ROS, Ansys, Solidworks, UG NX
- SCM: STM32, Arduino, Keil, Altium Designer, OpenMV
- PLC: Siemens PLC, Mitsubishi PLC

PHOTOS