Yunhai Han

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Education

09/2015~07/2019 **Yanshan University** **Qinhuangdao, Hebei**
Major: Mechanical Engineering(Mechatronics)
Degree: Bachelor of Engineering
GPA: 3.792/4.50
GPA ranking: 2nd of 594 students in the faculty

09/2019~present **University of California, San Diego** **San Deigo, California**
Major: Mechanical and Aerosapce Engineering
Degree: Master of Science

Extracurricular Activities and Honors

07/2016-07/2016 **Yanshan University**
Hebei, China
China Undergraduate Mathematical Contest in Modeling （CUMCM）
2nd prize in Hebei Province.
Mainly responsible for specific modeling and programming work.
Learned many mathematical algorithms, such as neural networks and various greedy algorithms and became skilled at utilizing MATLAB.

03/2017-5/2017 **Yanshan University**
Hebei, China
Zhou Peiyuan Mechanics Competition
National Excellence Award
Learned many mechanical analysis methods to understand the mechanical abstraction of the actual physical model.

05/2017-8/2017 **Yanshan University**
Hebei, China
National Electronic Design Competition
Successful Entry Certificate
Learned to use a variety of sensors and motor drives.
Learned to read the sensor data manual and carry out digital filtering and classic PID control algorithm through embedded system (STM32).

09/2017-09/2017 **Yanshan University**
Hebei, China
Asia-Pacific Mathematical contest in modeling (APMCM)
2nd Prize
Responsible for writing the theory in English, establishment, and analysis of models.

01/2018-02/2018 **Yanshan University**
Hebei, China
Mathematical Contest in Modeling （MCM/ICM）
Honorable Mention

Responsible for the establishment and analysis of the model.
Learned to use LaTex to complete a paper in English.

09/2017-08/2018 **Yanshan University**
Hebei, China RM RoboMasters (Organized by DJI)
2nd Prize
Mainly responsible for the visual components(mainly about object tracking and stereo vison) and the PID stability adjustment of the gimbal unit on the mobile tank (to prevent bumps and collisions during movement).

06/2018-07/2018 **Kanazawa Institute of Technology(KIT)**
Kanazawa, Japan 14th CDIO International Conference
Certificate for Attendance
Discussed the development trend of UAVs in the future and their social and technical problems with teammates from all over the world.
Designed and built the gripping mechanism attached to the bottom of the drone.

Projects

09/2019-present camera self-calibration

- Mainly responsible for the design of camera self-calibration algorithm for autonomous driving car in the AVL(Autonomous Vehicle Lab directed by prof. Christensen)(Programming language:C++).
- Learn to use ROS(Robot Operating System) for sensor data collection and publish(from cameras and lidar) and further analysis and simulation of data extracted from rosbag(Programming language:C++).

12/2018-03/2019 Robot navigation with VO(Visual Odometry)

- Learn the various algorithms from *Probability robotics* and ETH online course(Vision Algorithm for Mobile Robotics).
- Estimate the position and orientaion of the camera with monocular vision algorithm(PnP) with camera images provided by ETH(Programming language:C++).
- Be familiar with different mathematics tools for robot estimation, like Lie group and Lie algebra.
- Use different libraries including g2o, eigen, OpenCV and so on.

09/2018-12/2018 Design of a six-legged robot

- Build the 3D model of a six-legged robot with SolidWorks and make kinematics and dynamics simulations to improve its performance.
- Assmeble the robot and equip the robot with 18 steering motors(3 for each leg) for actuation.
- Make the robot more intelligent by adding different components like cameras for human face recognition and ultrasonic sensors for object detection(Programming languages: Python and C).
- Actuate the robot with steering motors and STM32 processor(Programming language:C).
- Use Oled screen for data visualization and speech synthesis module for voice prompts (Programming language:C).

09/2018-12/2018 Face recognition with onboard cameras

- Capture images from onboard cameras and detect the human faces in the images. If there are any human faces, compare them with the example faces in the database for classification. All these are done based on the human face detection and recognition libraries provided by Face++(Programming language:Python).
- Remote control the cameras on the robot(Programming language:C++).

08/2018-09/2018 Forward and inverse kinematics calculation of an robot arm(6 DOF)

- Do the forward and inverse kinematics calculation of a 6-DOF robot arm with a known physical configuration(Programming language:MATLAB) .

Standard Tests

TOEFL score 101 (101, R30, W26, L23, S22）
GRE score 325 (V156, Q169)

Academic Achievements

- I got National Scholarship from Chinese Ministry of Education in my 2nd year.
- I was awarded with the certificate of Excellent Graduates in Hebei Province.
- I was awarded with university scholarships for seven times.

Personal skills

- Excellent programming skills and hardware knowledge in mechatronics
- Proficient with C, C++, Python, MATLAB, Latex and good at Bash
- Be possessed of good teamwork, communication and organization skills
- Strong learning ability, outstanding academic achievements
- Be aware of the usage of different measuring instruments as well as electronics design methods

Graduate courses

2019 Fall Quarter:

- MAE280(Linear System Theory)
- CSE276A(Introduction to Robotics)
- ECE269(Linear Algebra and its Application)
- MATH271A(Numerical Optimization)

2020 Winter Quarter:

- MAE281(Nonlinear System)
- MATH271B(Numerical Optimization)
- ECE276A(Sensing & Estimation in Robotics)
- MAE145(Introduction to Robotic Planning and Estimation)