Curriculum Vitae
Mingcong Chen

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EDUCATION

Xidian University	Xi'an, China	09/2015-07/2019

- BEng in Telecommunication Engineering
- GPA 3.6/4

Heriot-Watt University (exchange)	Edinburgh, U. K	09/2018-05/2019

- BEng in Telecommunication Engineering with Honours of First Class
- Final project (Edinburgh Centre for Robotics): Build human body skeletons with 3D camera and classify body actions based on deep learning

Kings' College London	London, U. K	09/2019-11/2020

- MSc in Robotics (Pass with Distinction)
- Final project: Visual Servo Control and Modelling for Flexible Endoscopic Robots

AWARDS

- The Third Prize in Middle Conference of the 17th National College Students Robot Competition- ROBOMASTER 2018   05/2018
- The Third Prize in Global Final of the 16th National College Students Robot Competition- ROBOMASTER 2017
  08/2017
- The First Prize in Western Conference of the 16th National College Students Robot Competition-ROBOMASTER 2017   05/2017
- Chinese Software Copyright: Socket Based 6-axis Force/Torque Sensor Display and Calculate Platform (1st Inventors, 2021SR0377109)   11/2020

PROJECTS EXPERIENCE

- **Robotic Ultrasound Scanning for human leg**   05/2021-Now

  Developed a U-Net structure real-time vessel segmentation system with only 100 training data. A data augmentation approach is also included in the proposed method for generating ultrasound image-style elastic deformation and random shadow. The robot can track the vessel by following the segmentation results. To make sure the contact with the human body, the z-axis is controlled by an impedance control algorithm with a 6-axis force sensor. Confidence map that is an Ultrasound image-based algorithm is used for evaluating the quality of the imaging, which can control the rotation of the ultrasound probe.

- **Visual Servoing for Flexible Endoscopic Robot**   11/2019-08/2020

  To give a more straightforward model for the robot, a helix mesh design of the robot's tip is investigated in this project. To realize accurate control, the soft robot in this project is modeled by constant curvature to set up the relationship between working space, joint space, and actuator space. Moreover, an inverse kinematics model can solve the visual servoing task is demonstrated based on the differential Jacobian matrix and the estimated Jacobian matrix.

- **Vending Machine**（**15:1 model**）   09/2017-12/2017

  Responsible for software design. Based on C#, .NET designed the customer terminal and remote management terminal. The vending machine can realize the Chinese voice recognition controlling (Based on Windows system.speech). It can also send the sell details to a remote server and the remote management terminal can download and monitor the data (Based on SFTP).

- **IRobot Robot Team of Xidian University**   12/2016-08/2018

  As one of the funders of the team, the member of Robot Vision group, chef developer of Infantry Robot's Vision Algorithm System. Based on C++, OpenCV, Caffe developed an auto-aiming system which can detect the armor of enemy robots to realize auto-shooting function and competition field rune detection and auto-shooting system. Take the role of team projects managements and joint tests. In the summer camp, to serve as the interviewer of software algorithms.

WORK   EXPERIENCE

- **Institute of Automation, Chinese Academy of Sciences (CASIA)**   07/2021-Now
  Centre for Artificial Intelligence and Robotics (CAIR), Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences

  Position: Robotics Engineer

  Take charge to develop an automatic robotic vessel acquisition system. Participate in a neuro surgical robotic system development.

- **Haptron Scientific**   10/2020-06/2021

  Position: Research Assistant

  Developed a calibration system and a signal box for our 6-axis force/torque sensor. Designed a passive ultrasound examination platform with soft actuators.

- **Kings' College London / St.Thomas Hospital (Part-time)**   11/2019-04/2020

  Position: Research Assistant in Haptic Mechatronics & Medical Robotics Lab

  Build up a remote Bluetooth joystick control system for micro Dexterous Assistive Robotic Therapy (microDART) and develop a force sensing function for a colon phantom.

- **Inspur Group Co., Ltd (Summer Intern)**   07/-09/2018, 07/-09/2019

  Position: Research Assistant in Autonomous Vehicles

  Independently developed road identification detection and vehicle identification detection of automatic driving based on computer vision, code transplantation on ROS, and integration with partial codes of LiDAR; made a demo using Intel Realsense and Turtlebot (SLAM's application in automatic driving). Developed a objects detection system based on C++, OpenCV, Caffe, ROS and an action recognition system based on C++, Python, OpenPose, OpenCV.

EXTRACURRICULAR ACTIVITIES

Participated in Science and Technology Association of Xidian University, taking responsibility for the training of software and hardware technology for students in the whole university, and holding electronic design competition and assisting experts and professors to review and evaluate works.

PROFESIONAL SKILLS

- Proficient in multiple programming languages such as C, C++, C#, Python, Matlab; Rich experience in OpenCV development and the using of deep learning frameworks such as Caffe, darknet and PyTorch.
- Familiar with operation systems Windows and Linux and the development based on CMake under Linux. Also familiar with code management tool Git and mark-up language Markdown.
- Know the usage and development of ROS and basic drawing by Solidworks;

PUBLICATIONS

[1] Mingcong Chen, Junghwan Back, Chen Yu. A Vessel Realtime Detection Method Based on Markov Random Field, CN Patent 202110908455.3[P], 09/08/2021, filled 08/2021.
[2] Mingcong Chen, Junghwan Back. A Tactile Sensor Based on Light Bloking, CN Patent 202023304456.7[P], 31/12/2020, filled 12/2020.