Xie Yonghao

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EDUCATION

Nanchang Hangkong University   Sep 2016 – Jun 2020
Bachelor of Automaton, School of Information Engineering   **Nanchang, China**
- **GPA:** 3.4/4.0 (top 15%)
- **Honors:** National Inspirational Scholarship. First-class scholarship of the university. Second-class Scholarship of the university. Yuntayli Scholarship. Hong Rui Xing Scholarship. The Third Best Student of the University. H Prize of American Mathematical Modelling Competition. National second prize in the electromagnetic two-vehicle category of the "NXP Cup" National Student Intelligent Vehicle Competition. National third prize in the outdoor electromagnetic category of the "NXP Cup" National Student Intelligent Vehicle Competition. Third Prize in Computer Work Competition of Jiangxi Province.

Northeast Forestry University   Sep 2020 – Jun 2023
Master of Control Science and Engineering, School of Electrical and Mechanical Engineering   **Harbin, China**
- **GPA:** 3.5/4.0
- **Honors:** 2022 National Scholarship. First-class scholarship of the university. Thrid-class scholarship of the university. First prize of the "Electrician's Cup" mathematical modelling competition. Third prize of Asia and Pacific Mathematical Contest in Modeling Certificate of Achievement. Third prize of the 15th Math China Mathematical Modeling Network Challenge.

RESEARCH EXPERIENCE

Key Member, Smart car project   Dec 2017 – Aug 2018
Project "Intelligent two-vehicle automatic identification and car-participation study" Supervised by Prof. Wu Kaizhi   **Nanchang, China**
- Make two intelligent vehicles with automatic road recognition to accomplish automatic recognition of the correct road and planning of the optimal path, as well as to accomplish vehicle recognition and safe meeting on narrow roads.
- We made the basic car body, including drive motor, steering servo and other cart components; Then, we made the cart control and sensing unit, such as K60 controller, driver circuit, camera recognition module, ultrasonic sensor module, Bluetooth signal transmission module, etc. Finally, it will be divided into the debugging of master and slave car.
- The master vehicle signal and the slave vehicle signal were shared in real time, both the master vehicle or the slave vehicle could recognize the correct road and chose the shortest path to travel, when the roads slightly wider than the width of the two vehicles meet, they could complete the set road travel time in a safe form without collision conditions.

Team Leader, Research project   Dec 2018 – Jun 2019
RGV Path planning Study Supervised by Prof. Wang Changkun at Nanchang Hangkong University   **Nanchang, China**
- For an industrial product that requires the participation of multiple types of RGVs in its production, an RGV scheduling optimization model is developed to maximize the number of industrial products produced by the shop within a specified time.
- We set up the production line layout of RGV according to the production lines in the enterprise production hall; Then we specified the constraints of the production line according to the spatial layout and established an improved mathematical model for dynamic scheduling of travelers.
- Simulations were performed using MATLAB software, the data were substituted into the model for calculation, the results were compared with the existing model. The results showed that the improved mathematical model created has a greater improvement in efficiency than the original model.

Team Leader, Research project   Mar 2019 – Jun 2019
Siemens Smart Manufacturing Challenge Supervised by Prof. Wang Changkun at Nanchang Hangkong University   **Nanchang, China**
- Design a logistics system with the function of indoor and outdoor automatic navigation, the logistics trolley can automatically communicate with the elevator and automatic door and implement control of it, the trolley needs to accurately transport materials.
- We used PLC as central controller, STM32 as slave controller, in the STM32 and OV7670 cooperation to complete the visual recognition function, it sent the motor drive signal to the PLC controller, complete navigation control. Using the intelligent car to simulate the elevator door and complete the automatic communication, and finally we used the recognition of OV7670 and the robot arm to complete the material handling.
- The system navigation function was more accurate, communication information was shared in real time, trolley handling material accuracy and efficiency was high.

Key Member, Research project   Dec 2020 – Present
*Research on inertial sensor control methods and technologies (**National Key Research and development Program**) Supervised by Prof Zhang Jiawei*
- The research content is to establish the transfer function and noise equivalent model of each key unit of AC feedback actuation system, determine the noise source of AC feedback actuation system, complete the noise index allocation according to the project requirement index, and establish the theoretical analysis and experimental research on the noise of AC feedback actuator. After forming the theoretical model, the noise in time-sharing control mode and frequency-sharing control mode will be improved through hardware structure and optimization algorithm
- Analysis of the voltage noise in the actuator, because the actuator works in the low frequency band frequency, so the noise mainly comes from 1/f noise, scattering noise, thermal noise, etc. At present, the main attempts to improve the noise problem are: the use of digital and analog chopper self-stabilizing zero technology, reference voltage source temperature drift suppression, double-off double sampling technology, etc., the use of analog circuit form chopper self-stabilizing zero technology for noise suppression effect is good. In the control mode, there are two control modes, respectively, frequency division control and time division control. In the frequency division control mode, using PID control mode and PID hardware structure to improve the noise level, the frequency division mode consists of FPGA, DAC, buffer, inverter and operational amplifier (DVA), ADC circuit respectively, where the ADC circuit acts as a PID feedback unit, the voltage signal waveform using 30Hz ~ 270Hz AC voltage waveform, its maximum control voltage amplitude 9.1V. Time division control adopts PWM control mode, the main circuit is composed of FPGA, DAC, DVA circuit, using 250Hz pulse square wave, its maximum voltage amplitude is 141V, because this mode uses 20-bit DAC for analog-to-digital conversion, so the main influence factors are reference voltage source fluctuation, device 1/f noise, suppressing reference voltage source fluctuation noise and 1/f noise becomes critical. The important parameters in the circuit are optimized in order to select the optimal device parameters and obtain the best voltage noise level. At present, the circuit characteristics in the DVA circuit are mainly optimized by particle swarm optimization algorithm and ant colony algorithm to obtain better circuit characteristics parameters, and the parameters considered are turn frequency, amplitude margin, phase margin

and other circuit characteristics parameters. After obtaining better circuit characteristics, according to the circuit characteristics data at this time, the specific model of the circuit is matched to complete the selection of circuit hardware device model parameters.

- Having established AC feedback actuator for noise theory analysis, noise modeling, parameter verification, a clearer understanding of AC actuator noise sources, and in the process of pushing the relationship between voltage to force, I master certain mathematical theoretical basis and noise analysis methods. In the use of python programs for DVA circuit parameter optimization, in the use of chopping and parameter optimization and other noise suppression methods to reduce the circuit low frequency noise, I have a certain degree of programming practice.

LEADERSHIP/TEAMWORK EXPERIENCE

Centre for Science and Innovation, Nanchang Hangkong University   Sep 2017 – Jun 2018
Laboratory Assistant   **Nanchang, China**
- Organising visits to the laboratory for new students and passing on the experience gained in the laboratory to the next class.
- Being responsible for the professional skills training of the next class of students, and organising the training of intelligent vehicles in the college.
- Manage laboratory safety and order issues, as well as be responsible for component procurement, etc.

Student Union, School of Mechanical and Electrical Engineering   Sep 2020 – Jun 2021
Director of Science and Innovation Center   **Harbin, China**
- Responsible for postgraduate level competition news release
- Organizing and serving the graduate student competition, coordinate the venue and provide college resources for the participants

INTERNSHIP EXPERIENCE

TeLLHOW Technology Co.   Jun 2017 – Sep 2017
Test engineer in the test department   **Nanchang, China**
- Responsible for testing of small silent power supply voltage regulator circuit and feeding back problems to the design department.
- Checking the component list and completing the data recording work of filling in the relevant test documents.

Qinghui Chuangtong Technology Co.   Jun 2020 – Sep 2020
Hardware engineer in hardware design d epartment   **Beijing, China**
- Designed the circuit board for Bluetooth burning under multi-channel (40 channels) mine, and installed the circuit board with the designed die, burned the Bluetooth firmware program in the burner (STM32) to each Bluetooth module in turn, and feet the burning result to the upper computer. Docking with the protocol of the upper computer program, if it failed, feedback the failure signal, so that the burner re-burned this Bluetooth until the program was completely downloaded into the Bluetooth chip.

SKILLS

- **Languages:** English (Fluent, CET6), Mandarin (native).
- **Programming Languages：** Matlab, C, Python.
- **Interests:** Music, Running, Playing basketball.

PUBLICATIONS

- Zhang J, **Xie Y**, Huang J, et al. Design and simulation of reference voltage sources circuit in lasers [J]. Microwave and Optical Technology Letters. (Supervisor as first author)
- Jiawei Zhang; **Yonghao Xie**; Mingze Yuan, et al. A Self-adjusting Parametric Model for Attenuation Characteristics of WUSN Signal. (Under Review, Supervisor as first author)
- F. Zhao, J. Zhang, N. Zhang, Z. Tan, **Y. Xie**, S. Zhang, Z. Han, M. Li. (2022). Detection of cucurbits' fruits based on deep learning. INMATEH-Agricultural Engineering, 66(1).