Xiao HU

| +86 13102573778 | xiao.hu1997@outlook.com

EDUCATION

University of Florida, Gainesville, FL 08/2019 - 05/2021
- Major in Electrical and Computer Engineering, minor in Computer Science
- Master of Science
- GPA: 3.5/4.0

East China Jiaotong University, Jiangxi, China 09/2015 - 06/2019
- Major in Software Engineering +Rail Traffic Signal and Control
- Bachelor of Engineering
- GPA: 3.59/4.0

Personal Academic website: https://huxiao1.github.io/

RESEARCH EXPERIENCES

Institute of Automation, Chinese Academy of Sciences *Supervisor: Jundao Pan*
Research Assistant 12/2021 - Present
- Participate in the autonomous driving robot project
- Aim to realize a wheeled robot that can be driven automatically, including chassis control technology, autonomous driving navigation technology and autonomous driving mapping, planning and perception technology

Institute of Software, Chinese Academy of Sciences *Supervisor: Jingzheng Wu*
Research Assistant 05/2021 – present

Project 1
- Proceed fuzzy test for common protocols (Modbus protocol) and private protocols (Siemens s7 protocol) to find out the vulnerabilities of the corresponding plc devices
- Build a hardware test environment by myself and write an automatically generated message script in python to send s7 messages or Modbus messages to the plc device in the simulation environment, to determine whether an error result is generated according to the response message sent from plc
- Use the knowledge of AI to make the script automatically filtering the generated messages, to determine whether the generated results are correct, which can greatly reduce the time of fuzzy testing

Project 2
- Obtain vulnerabilities of the robot system by means of the Agent program written in Go and C, to access the system information and other useful information
- Transmit the obtained information to the upper computer and the external online platform via the WIFI, serial and CAN module equipped in the machine
- Realize the extraction and display of the system information from different robot systems (Vxworks, QNX, SylixOS and Linux), and the information acquired by the Agent program in the System on Chip can be transmitted to the host computer in different protocols via various ports

Institute of Computing, Chinese Academy of Sciences *Supervisor: Hang Lu*
Research Assistant 12/2020 - 03/2021
- Developed the CNN model of the embedded platform and the CNN model based on AlexNet for image recognition, as well as quantified the model to reduce the training time on the GPU and inference time on the embedded platform without reducing accuracy greatly
- Wrote a model based on Yolo v3 for video pattern recognition and used the pruning method to prune the Yolo v3 model, so as to reduce the training time on the GPU and inference time on the embedded platform without reducing accuracy, and deployed the pruned model to the SoC, used real-time cam monitoring to realize the transferring to the embedded platform
- Achieved the training time of the quantified Alexnet model reduced by 30% amid accuracy declined only 0.08
- Improved the precision of Yolo v3 model after pruning, achieved the recognition of each frame reduced by about 2latency/FPS and more accurate recognition of the objects in a video than the original model

Institute of Automation, Chinese Academy of Sciences *Supervisor: Fei Xu*
Research Assistant 02/2018 - 04/2018
- Developed an intelligent industrial control system which adopted double layer industrial networks (MODBUS TCP & MODBUS RTU) to control position servo motor and a large number of lights and fans
- Combined the advantages of RTU protocol and TCP protocol, and made up for each shortcomings
- Designed PC software by using configuration software, finished protocol conversion programming in C++, and used MFC framework independently
- Certified with Copyright of Computer Software for *Intelligent Device Control System Based on Double Layer Network of Modbus*, 2018SR528477

PROJECT EXPERIENCES

Realization of Compression and Decompression Algorithm in Embedded System *Supervisor: Prabhat Mishra*
04/2021-05/2021
- Completed the code decompression and compression algorithm of the operating system, including the commonly used dictionary direct index algorithm, the multi-bit bit-mask algorithm and the newly proposed RLE algorithm

Jihang Innovation - A New Era of Unmanned Aerial Operation
Technician 12/2020 - 2/2021
- Took charge of the Camera Mode Recognition and training of the neural network
- Used Dichotomy and Bayesian Optimization to adjust parameter so that the final accuracy was improved to 99.5%

- Gained a profound understanding of the neural network's design, grasped some methods of adjusting the parameters, and understood the combined application of deep learning and unmanned aerial vehicles
- Won the silver prize for out-standing performance in the 6th China International College Students' 'Internet+' Innovation and Entrepreneurship Competition

Creation of A Petri Net Simulator for A Simple Processor *Supervisor: Prabhat Mishra*
01/2021- 02/2021

- Designed instruction memory, register file, and data memory of the Petri net model
- Designed eight transitions that the remaining places could be viewed as buffers

MIPS Design and Implementation of the Five-Stage Pipeline *Supervisor: Prabhat Mishra*
03/2020-06/2020

- Realized that the simulator could load the specified MIPS text file and generate cycle-by-cycle simulation of the MIPS code, and generate/print the contents of registers, queues and memory data for each cycle

Intelligent Household Security System Project
Developer 01/2019 - 05/2019

- Independently completed the project from transplantation of the bottomed operating system to the establishment and debugging of the software and hardware environment
- Wrote the intermediate device driver, web page and the final interactive script of uploading and delivering the data
- Adopted a layered sense to develop the whole system, used different data structures to upload and deliver the data streams to fit for the field facility and environment, and realized an intelligent household security system from the bottom to the users
- The project was awarded the excellent graduation project

Development of Radar-Based Basic Parameter Measurement System for Overhead Contact System
Supervisor: Zhongbin Chen
Group Leader (overall duties: marketing, research scheduling, programming, debugging, etc.) 05/2018 – 08/2018

- Assembled and remolded LMS511 radar and embedded it into the rail inspection vehicle to realize dynamic monitoring, and made matched equipment, such as transformer and 24V powers supply
- Rewrote the program for driver interface, realized detecting algorithms for Catenary guide height and Catenary pull-out value, designed data parsing algorithm to measure the parameters of railway overhead contact system and added to the user-oriented driver program wrote with qt of C++
- Achieved Special Scholarship for Innovation and Entrepreneurship
- Being selected into "Jeme Tien Yow Class" for both academic excellence and standout research and innovative ability

PUBLICATIONS

Xiao Hu, Hao Wen. (2021). Research on Model Compression for Embedded Platform through Quantization and Pruning, *ICAITA 2021 Conference* (Accepted)

Xiao Hu, Guanzhong Ye, Chunxiao Xu. (2018). Double layer network communication based on modbus protocol. *Electric Engineering*, ISSN: 1002-1388

AWARDS AND HONORS

- International-Level Silver Prize in the Organizing Committee of China International College Students' 'Internet+' Innovation and Entrepreneurship Competition -Top 3% (11/2020)
- University-Level Engineering Achieve Awd Wvr M (09/2020, 01/2020, 08/2019)
- University-Level 3rd Class Scholarship (12/2018)
- University-Level Merit Student (12/2018, 11/2017, 04/2017, 12/2016, 06/2016)
- Honor of "Technical Talent" of 2018 East China IT Training Camp held by National Development and Reform Commission and Microsoft Software Innovation Center Jiangxi Office (11/2018)
- Title of Charity Ambassador, China Youth Development Foundation, Hebei (06/2018)
- Province-Level 3rd Prize in "Maker in China" Innovation and Entrepreneurship Competition in Jiangxi Province (04/2018)
- University-Level 1st Prize in Dual-basis Software Development Competition (04/2018)
- University-Level 1st Class Scholarship (11/2017, 06/2017)
- National-Level 3rd Prize in National English Competition for College Students (05/2017)
- University-Level Award on Science and Technology (04/2017)
- University-Level 2nd Class Scholarship (12/2016, 06/2016)
- Excellent Student Leader (12/2016, 06/2016)

OTHERS

- Computer: Proficient in C, C++, MATLAB, Python, Linux, Javascript, CSS, HTM15, Auto CAD
- Certificates: Computer Programmer Grade 4th, China Ping'an Love Public Welfare Certificate
- Hobbies: Cycling, Traveling, E-sports, Micro-electronics