SHANG Zhenyu

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Yinchuan
https://github.com/Skylakc?tab=repositories

INTERNSHIP EXPERIENCE

The Hong Kong Polytechnic University Oct 2023 - Present

Research Assistant Department of Electric and Electronic Engineering Hong Kong

- Assisted the supervisor in Electrical Vehicle Laboratory.
- Managed hardware and software development for **EVTOL** projects.
- Made **PMSM** driven applications on **FPGA** based hardware.

CMCC Ningxia Feb 2023 - May 2023

Assistant Yinchuan

- Participated in the construction of base stations and assisted in the daily maintenance of the server room.

Beijing Shen Fan Technology Ltd. Jan 2022 - Jun 2022

Head of hardware development Beijing

- Implemented the reverse development of communication interfaces to existing laboratory equipment.
- Implemented the **remote** communication of equipment, uploaded data and controlled.
- Completed a web management platform allow users to analyze and experimental data online.

HONORS & AWARDS

Outstanding Undergraduate Thesis June 2022

2021 TI Cup National Undergraduate Electronic Design Contest Second Prize （全国大学生电子设计竞赛） Dec. 2021

2021 TI Cup Yunnan Undergraduate Electronic Design Contest First Prize Nov. 2021

12th “LanQiao” Cup EDA team competition first in Yunnan Province Aug. 2021

The Heilongjiang Province International College Students' 'Internet+' Innovation and Entrepreneurship Competition Golden Prize Aug. 2021

“HACH” 15th National Environmental-friendly Science &Technology Competition Third Prize Aug. 2020

2017 Tsinghua University Engineering Winter Camp Third Prize Jan. 2018

Chinese Chemistry Olympiad Preliminaries(CCHO) First Prize July 2017

CCTV1 China Youth Science Mobilization（中国青少年科学总动员） Champion May 2017

The Soong Ching Ling Award for Children´s Invention “Hardware-implemented speech recognition system” Golden Prize April 2017

RESEARCH EXPERIENCE

Smart Home System Jan 2020 - Present

Independent Research Yinchuan

- Participated in the development of Home Assistant framework.
- Customized the online control unit of each home device through secondary development of ESP series chip and CC2652 chip and draw PCB. Divided into access control, lighting, automatic farm, automatic fish tank, intelligent voice and background music, streaming media system, room positioning and personnel management, automatic central air conditioning and fresh air system, energy management system.
- Achieved some degree of automation through IBM NodeRED streams. Combined with **Tensorflow/Onvif/OpenCV** for people and vehicle management. Room location and preferred scene setting via BLE signal strength. Smart media and whole house voice via DLNA/Upnp,SnowBoy,TTS.
- Implement the **MPPT** controller to home **PV plant** energy storage and grid-connected power generation.

Re-engineering and manufacturing of VW PQ34 engine Feb 2022 - May 2022

Independent Research Yinchuan

- Implemented a turbocharger to a naturally aspirated engine by **CNC** parts.
- **Redesigned** pitsons, crank shafts and VVT.
- Implemented intake air pressure control of the turbocharger by reading engine operation data.

- Reverse development of the BOSCH ME7.5 MPI control system.

Milliwatt Low Power Embedded Server Development Nov 2021 - Feb 2022

Hardware Design Yinchuan

- Implemented the energy is provided by **potato protocell**
- Based on the **BQ25570** energy collector is used to collect and boost the weak power of the potato primary battery.
- Achieved low power consumption(Avg. **3mW**) design and maximum power transmission(5mW).
- Implemented BLE transmission and 8MHz Arm CPU.
- **Tsinghua** University 2022 Admissions Video 'Potato Boy' **Hardware Prototype**

VSLAM technology for multi-rotor UAVs Jul 2021 - Nov 2021

* This project participate in the TI Cup Group G and won the national second prize Kunming

- Managed hardware and software development.
- Achieved Indoor navigation and obstacle avoidance of UAV are based on **VSLAM**.
- Implemented autonomous path planning on **ROS**.
- Insteaded the UAV self-stabilization algorithm from **PID** to **MPC** by rigid body dynamics modeling and better stabilization capability was achieved.

Application of multiple sensor sensory fusion in automatic path planning car Jun 2021 - Jul 2021

Administrator of National Student Innovation Project（国家级大学生创新项目） Kunming

- Implemented the autonomous path planning and active obstacle avoidance processing by fusing VSLAM camera, GPS, and LIDAR.
- Combined with the **dynamics model** of the robotic arm to achieve autonomous navigation for outdoor object grasping.

Smart cart with monocular camera navigation Jan 2021 - Jun 2021

*This project participate in the Smart Car Competition Kunming

- Implemented the **path planning** through the camera
- Implemented the combining the position-based PID and incremental PID algorithms to control the motor and steering respectively. The car achieve the smooth recognition and passing of elements such as traffic circles, intersections, curves, arch bridges and garages in the track.

PSoc controller for high power resonant inverter Mar 2021 - May 2021

Independent Research Kunming

- Implemented a **series resonant inverter** control unit under PSoc chip-based control.
- Achieved average input power of approx. **15kW**, peak resonant loop current of **3000A**. The Tesla coil secondary output arc length of approx. 4 meters.
- Intergrated FreeRTOS, all sensor signals were digitized and transmitted to the control computer via optical fiber for data analysis and fault debugging.
- Achieved optical fiber-based **IGBT levitation** drive.
- Implemented a NodeJS and TCP serial port based upper computer.

Wireless image transmission based on AD9361 chip Sep 2020 - Nov 2020

Independent Research

- Implemented a **software defined radio (SDR)** by Zynq XC7020, STM32H750, AD9361
- Implemented fast H264 encoding IP Core by Zynq PL side and transmitted through **AD9361** as RF driver unit.
- Implemented **1080i** 50FPS HD video transmission.
- Implemented a total transmission delay of about **110ms**

U.2 SSD Portable Docking Station Feb 2020 - May 2020

Independent Research ShangHai

- Implemented the bridge between USB3.2Gen2 and PCIe signals, successfully running NVMe protocol.
- Implemented the demanding power timing management of U.2 SSD.
- Implemented the enterprise-class SSD features such as power failure protection and write-back to work properly on this power station.

Portable photography light Oct 2019 - Oct 2019

Independent Research Yinchuan

- Completed a high-density, high-power DC-DC circuit with adaptive input voltage, constant current source, etc.
- Implemented self-organizing **MESH** network function (**Zigbee**). The cell phone is the remoter for group control.

Portable CO2 Laser Oct 2014 - Dec 2014

Independent Research Yinchuan

- Implemented a full-bridge inverter circuit with a **TL494** chip as a sawtooth wave generator. The circuit operate in **ZVS** soft-switching mode.
- Implemented a digital control high-voltage power supply to realize the work mode of voltage from start to the stable work of the LASER, while the output power can be adjusted.

EXTRACURRICULAR ACTIVITIES

College Intelligent Electronics Studio Jul 2020 - Dec 2021

Administrator Kunming

Coordinate the work of the studio, host innovative entrepreneurial activities for college students, train electronics enthusiasts, and participate in electronic design competitions.

Yinchuan No.1 Middle School Science and Technology Innovation Studio Sep 2016 - Jun 2017

Administrator Yinchuan

Coordinating resources, training, and leading students in the China Youth Science and Technology Innovation Competition

MISCELLANEOUS

- **Skills:** Matlab,Altium Designer,Cadence,PSpice,Multisim,SolidWorks,C/C++,Python,Arm,Linux,Embedded Chips,FPGA,Davinci Resolve,Adobe Photoshop/Premiere/Audition/Lightroom,Cinema 4D
- **Certifications:** Industrial Internet Embedded Development Engineer Junior of EDA design and development,C Programing Language Computer Level 2
- **Languages:** CET-4 IELTS-6
- **Interests:** Video Production,Starry Sky Photograph,Piano,Football
- **Activities:** 2017 Tsinghua University Engineering Challenge Camp

EDUCATION

Kunming University of Science and Technology Sep 2019 - Jun 2022

Electronic Engineering Bachelor Faculty of Information Engineering and Automation Kunming

GPA 3.54/4

Weighted Average 87.96/100

Weight Average of Required Courses for Majors 89.6/100

Yinchuan NO.1 High School Sep 2016 - Jun 2019

Senior High School Yinchuan