

YIHAO (Charles) CAI

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USA Citizenship Status: Green Card Pending (Due to Covid-19)

EDUCATION

Worcester Polytechnic Institute (Worcester, MA, USA)

Sep. 2021 – May. 2023 (Expected)

- Major: Robotics Engineering – **Master of Science**
- GPA (Present): 3.66/4.0
- Relevant Coursework: Foundations of Robotics, Robot Dynamics, Robot Control, HRI (Human Robot Interaction), Computer Vision, Machine Learning, Motion Planning, Operating System, Data Structure, Algorithm Design, amongst others

Nanjing University of Post and Telecommunication (Nanjing, Jiangsu, China)

Sep. 2016 – Jun. 2020

- Major: Special Talents Program (Telecommunications Engineering) – **Bachelor of Science**
- GPA: 3.4/4.0 (by top 15%)
- Relevant Coursework: Engineering Mathematical Analysis, Circuit Analysis Fundamentals, Signals and Systems, Simulated Circuits, Digital Circuits, Telecommunications Principles, Digital Telecommunications Circuits, Computer Networks, etc.

WORKING EXPERIENCE

Hillstone Networks Co., Ltd

Apr. 2021 – Aug. 2021

Software Development Engineer, Department of Cloud Security

- Utilize orchestration tool Kubernetes to organize Docker container-clusters running on the cloud platform (SaaS-based), and design a security scheme following CIS Benchmarks to protect against both internal and external container threats
- For low-level layers like Linux Kernel, I apply mechanisms including SELinux, AppArmor, eBPF and IPC namespace on OS; for high-level ones, I create policies for securing interactions among Docker modules (dockerd, containerd and runc, etc.)
- All business models are written in language Golang for Product HSCA (HillStone Cloud Armor), and common RPC frameworks (Http, Restful, gRPC) are implemented for microservice submodules communication and correspondence during runtime

iWhaleCloud Computation Technology Co., Ltd

Jul. 2020 – Mar. 2021

DevOps (Delivery) Engineer, Department of International & Operation Center

- Deployment and maintenance of Java middleware on distributed servers for different architecture needs like Reverse Proxy (Nginx), Load Balancer (Dubbo, Zookeeper), Application Runtime (Tomcat) and Quick User Data Access (Redis), etc.
- Test and debug for business cases through logfile. Monitor and examine network performance for traffic flow by sending packets via socket program, and utilize Tcpdump to analyze them with Wireshark (packets are filtered by iptables chain rules)
- Connect Oracle database with PL/SQL and create stored procedure statements to manage user data. Also, Shell scripts are written for specific task execution and interaction among servers (like Remote File Transfer, Batch Processing, and so on)

RESEARCH EXPERIENCE

WPI HiRO (Human-Inspired Robotics Laboratory) Lab Researcher

Sept. 2021 – Present

- Working on *Perception-action Coupling in Robot Teleoperation* with fields focused on HRI (Human Robot Interaction)
- Development of wearable system using RealSense Cameras, HTC Trackers and VR Headset with Unity and C#. Design User Study and collect/analyze data for the research results (<https://github.com/CharlesCai123/Wearable-MultiCamera-System>)

National University Science & Technology Innovation Program – SLR (Sign Language Recognition) Sept. 2018 – Jan. 2020

- Data Extraction of sign language features from a batch of video frames captured by Kinect-V2 (C++ & Python) plus image-processing algorithms from OpenCV (Edge Detection, Threshold Segmentation, Image Filtering) as optimization procedure
- Implementation of Neural Networks (C3D, LSTM, R(2+1)D, etc.) to train model and model parameters adjustment on server

An Intelligent Housekeeper System Demo Design Based on Physical Raspberry Pi using C++

Dec. 2018 – May. 2019

- Creation of a master controlling system with deployment of wires on bread board for the hardware part of whole project system used for scenarios where people deal with daily routines at home (Smart House System)
- Coding for different module sensors using C++ and a user-friendly GUI design with Qt Creator under Raspberry Pi

Summer Mathematical Modelling Application Activity

Jun. 2018 – Sept. 2018

- Master common mathematical models and algorithms like regression model, correlation analysis and grey prediction, etc.
- Responsible for creating mathematical models applied to daily life and improve the parameters (Matlab)

University Automation Science Laboratory Robotics Research Project – 2 years

Jan. 2017 – Dec. 2018

- Manipulate physical robots (TurtleBot, DOBOT Arm, etc.) in lab to perform basic tasks (Navigation, Locomotion, etc.)
- Build a framework for robot hand-eye coordination system using Halcon and Matlab, plus implementation of it for object detection and grasping without collision using motion planning algorithms from MoveIt library

EXTRA-CURRICULAR ACTIVITIES

- Member of Cyber Security and IEEE Club in WPI 2021 - Present
- Founder Member of University Piobot Robotics Club in NJUPT 2017 - 2019
Team Leader of Robotics Arm Team, organizing instruction lessons and participating in national competition and projects

HONORS / AWARDS

- Paper with field focused on HRI to be published on ICRA 2021 (On Process) 2021
- Paper published on IWPR 2020 (DOI: <http://dx.doi.org/10.11117/12.2574424>) 2020
- First Prize in 2018 National University Artificial Intelligence Internet Innovation Competition 2018
- Third Prize in Jiangsu Provincial Mathematics Modelling Competition 2018
- Third Prize in 2018 China National Service Robot Competition 2018
- First Prize in Jiangsu Provincial University Advanced Mathematics Contest 2017
- Faculty Honors: Faculty Academic Excellence Scholarship, Civilian Award 2016 – 2017

SKILLS

- **Programming Languages:**
 - **Skilled:** C/C++, C#, Python, MATLAB, Shell/Tcl, Golang, PL/SQL
 - **Mastered:** HTML5/CSS, Java, JavaScript, Assembly, VHDL/Verilog
- **Tools/Platforms:**
 - **Editors:** Vim, Microsoft Office, Sublime Text, VSCode, UltraEdit, OmniGraffle, Geany
 - **IDEs:** Microsoft Visual Studio, Unity3D, CLion, PyCharm, MASM, Wireshark, SolidWorks, Qt Creator, Eclipse
 - **Frameworks:** ROS, CMake, Docker/Kubernetes, Tomcat, Nginx, Git/SVN, Oracle, TensorFlow/Keras, SoapUI