

张 伟 (Charmve)



Email: <u>yidazhang1@gmail.com</u> Mobile: (+86) 153 0145 3650 Website: <u>charmve.github.io</u>

Biography & Research Interests

I'm employed at **Momenta** and **QCraft** successively, both focus on automatic driving system for mass productions, as a **Senior R&D Engineer**. Before joining Momenta, I was employed at Future Security Labs of **Qihoo 360** as a Research SDE. Before that, I have received B.Eng. and B.A. from Yangzhou University (YZU) in 2020, supervised by Lei CHEN and Xiaoying DENG at 601 Innovative Electronics Lab, and thanks for academic guidance from Kaige GAO.

My research interests lie at **Machine Learning** and **Computer Vision**. To build practical theory for real machine intelligence, I am going to focusing on data-driven vision perception and end-to-end closed-loop framework for autonomous vehicles. https://github.com/Charmve

Employment

算法及工程化

Onboard Infra / QCraft

Suzhou, China 2022.04-present

- 国内第一个基于地平线 J5 平台实现城市 NOA 自动驾驶量产的团队, J6 仅用两周完成适配上线;
- Bazel-clang 交叉编译框架搭建,支持 J5、Orin、Xavier、X9HP 多款异构 ARM 平台,实现超大系统编译构建,熟悉编译时和运行时底层原理,FDO 优化、编译加速、包管理,搭建 PerfOps 系统性能自动化运营平台
- 系统性能优化(算法优化、CPU 优化、内存优化)、性能分析工具开发性能优化:编译优化、指令优化(Neon)、算法优化
- HIL 数据回灌:基于 perf-service 调度的大规模数据回灌平台开发,全量传感器数据回灌、耗时优化,减少实车测试
- 将交叉编译框架、模型量化推理部署框架、HIL 数据回灌横向扩展、纵向挖掘,服务于赛里斯 F5、广汽 A02、理想 Pro(龙城)量产项目,多次获得内部奖励
- 感知模型量化部署: QNN 量化推理部署框架,前后端设计,支持 onnx、tensor-rt、libtorch、hbm 多个后端
 - ◆ 模型推理:模型转换、Cuda 算子开发及优化、并行加速
 - ◆ 模型压缩: 训练后量化 PTQ (低比特量化)、模型剪枝、模型压缩、稀疏化

Senior R&D Engineer

MPilot / Momenta

Suzhou, China 2021.10-2022.04

- 走完智己 L7 量产完整路线,带领团队完成多个 millstone 交付,获得 2021 年度**最佳产品落地奖、飞轮嘉奖令**;
- Nvidia Drive Xavier & Orin(QNX 系统)图像处理加速,感知模型评测、HIL **数据回放**、CI-CD-CT 流程搭建;
- 熟悉自动驾驶系统软件架构,数据闭环和功能闭环,熟悉感知模块、系统集成,熟悉 C++性能优化,模型量化部署;

Research Software Development Engineer

Future Security Labs / Qihoo360

Beijing, China 2020.06- 2021.10

- Unicorn Team 队员,研究方向为无线电安全和漏洞安全;
- BLE 低功耗蓝牙协议 fuzz、漏洞挖掘:指定 BLE 设备连接阻断 9、BLE 中继攻击 10、协议 fuzz 策略研究
 - ◆ 针对低功耗蓝牙协议栈的安全问题进行深入研究,基于模糊测试方法对其进行 fuzz 漏洞挖掘。在此基础上,实现了针对特定低功耗蓝牙进行阻断和中继的技术专利方案,该软件实现方法也作为物联网设备的安全漏洞扫描工具,实现每年近 200 万元创收。
- 面向攻击者视角下的安全评估平台开发:基于 ATT&CK 框架的漏洞匹配算法,攻击链建立,安全风险评估
- 图像隐写:传统方法-图像编码[<u>Demo</u>] | [<u>PyStegosploit</u>]、深度学习方法 [<u>GitHub</u>]

Founder

Maiwei Information Technology Co., Ltd.

Yangzhou, China 2018.08-2020.07

- 主要两款产品: 真3D·全彩显示阵列、微步-室内送餐机器人;主要业务范围:创新电子设计、智能嵌入式系统设计、计算机视 觉解决方案;举办电子设计冬/夏令营,承接赛前集训。团队成员的学术科技成果反哺于公司业务,形成良好的商业模式。
- 获得包括全国大学生创新创业省基金项目、江苏伯藜创投基金支持,荣获互联网+创新创业大赛全国三等奖、华东赛区一等奖, 江苏省伯藜创业计划大赛一等奖;

Educational Background

扬州大学,信息工程学院(人工智能学院)

创新电子 601 实验室成员

2016.09-2020.07

- 唯一一名双收国家级奖学金和费孝通奖学金获得者、连续三年国家励志奖学金,专业成绩专业前1%;
- 获得中国大学生机器人创新设计大赛**全国二等奖**、全国大学生 FPGA 设计邀请赛**全国二等奖**、全国大学生电子设计竞赛省二等奖、 全国大学生互联网+创业大赛华东赛区**一等奖**、全国三等奖等多项项奖;
- 全国大学生社会实践"强国一代新青年"、全国大学生"百佳志愿者"、"大学生公益之星"荣誉称号获得者;
- 发表 SCI 及中文核心期刊**四篇**、申请发明专利 16 项、授权软件著作权 9 项, 主持 3 项基金项目,发布专著一部。

● 辅修第二学位:经贸英语,第二外语日本语等级: JLPT N3,英语 CTE6、雅思 6

南京大学,电子科学与工程学院

江苏省大学生万人计划学术交流项,优秀营员

2019.01-2019.02

- 作为本校唯一一名本科生入选江苏省大学生万人计划,发表一作 SCI 论文一篇;
- 参加学术讲座及人工智能开发实训,学习人脸识别、目标检测、图像处理等内容,并通过 arm 中国人工智能开发课程考核
- 作为学生代表进行口头报告"基于机器视觉的农业病虫害识别研究",获得"优秀营员"和"每日之星"

Publications

- [1] **Wei Zhang.** "A Survey of Field Programmable Gate Array-Based Convolutional Neural Network Accelerators". International Journal of Electronics and Communication Engineering. 14(12) 2020. 419-427. https://publications.waset.org/10011686/pdf
- [2] Wei Zhang. "A Design of 3D Dynamic Display System Based on Voice Control". Internet of Things Technologies. (Preprint)
- [3] Wei Zhang. "F-LS: An indoor positioning method and implementation based on Bluetooth low energy location fingerprint-least squares fusion". Electronics World. (Preprint)
- [4] Wei Zhang. "A Simulated Electromagnetic Curved Shooting Gun Based on Monocular Ranging: Design and Implementation". Internet of Things Technologies. (Preprint)
- [5] Gao Kaige, Liu Chunlin, **Wei Zhang**, Wang Kangni, Liu Wenlong. (2020). *Pyroelectricity and field-induced spin-flop in* (4-(Aminomethyl)pyridinium)2 MnCl4·2H2O. Royal Society Open Science. 7. 200271. 10.1098/rsos.200271.

Books

- [1] **Wei Zhang***. **Computer Vision in Action**. Computer Vision Algorithms and Applications, a Chinese closed-loop e-book contains source code, notebook, tech community. [Project website] | [Online book] | [GitHub]
- [2] Wei Zhang*. Open-source: **国内首个占据栅格网络全栈课程**《从 BEV 到 Occupancy Network: 算法原理与工程实践》[Course website] | [Slides] | [GitHub]

Patents and Copyrights

★ 27 Patents:

- [6] 张伟. 一种深度学习模型推理加速引擎、系统及设备[P]. (in Examination)
- [7] 张伟. 一种图像嵌入盲水印的方法、攻击方式及系统[P]. PA21117882CN
- [8] 张伟. 一种自动驾驶系统对采集数据进行回放的处理方法[P]. CN115062190A
- [9] 张伟. 面向自动驾驶系统内部模块的消息发布-订阅处理方法[P]. CN115080268B
- [10] 张伟. 一种共享消息的管理方法[P]. CN115114048A
- [11] 张伟. 一种自动驾驶的数据回流处理系统[P]. CN116353614A
- [12] 张伟. 一种基于深度学习的图像嵌入盲水印的方法、系统及设备[P]. (in Examination)
- [13] 张伟. 一种数据转换方法、数据结构、转换装置、介质及设备[P]. (in Examination)
- [14] 张伟. 自动驾驶量产集成项目中的全算法在线仿真工具[P]. (in Examination)
- [15] 张伟. 基于 QEMU 的自动驾驶虚拟仿真系统设计[P]. (in Examination)
- [16] 张伟. 漏洞匹配方法、装置、设备及存储介质[P]. PA21119974CN
- [17] 张伟. 攻击者视角下的安全评估方法、装置、设备及存储介质[P]. PA21119975CN
- [18] 张伟. 一种触控模组、系统及反馈控制方法[P]. (in Examination)
- [19] 冀磊,张伟.一种低功耗蓝牙通信中继方法、装置、设备及存储介质[P]. PA21100821CN
- [20] 冀磊,张伟.一种低功耗蓝牙连接阻断方法、装置、设备及存储介质[P]. PA21100820CN
- [21] 张伟, 冀磊. 一种蓝牙设备追踪方法、装置、设备及存储介质[P]. PA21100823CN
- [22] 张伟, 冀磊. 一种蓝牙通信参数解析方法、装置、设备及存储介质[P]. PA21100822CN
- [23] 张伟. 一种动态显示系统、装置及方法[P]. PA20120327CN (in Examination)
- [24] 张伟. 一种显示阵列控制电路、装置及光立方 [P]. (in Examination)
- [25] 邓小颖,张伟,杨啸风,陈卫峰. 一种嵌入实时环境信息的网络摄像头[P]. CN209608763U, 2019-11-08.
- [26] 杨啸风,张伟,邓小颖,陈卫峰. 基于树莓派的盲人阅读辅助设备[P]. CN209281692U, 2019-08-20.
- [27] 王子佳,张伟,杨啸风,王伟. 一种基于物联网 RFID 技术的校园一卡通联合商家会员系统[P]. CN208722234U, 2019-04-09.

★ 9 Granted Software Copyrights:

[28] Industrial Control System Network Attack Chain Automatic Generation Platform (360 工控网络攻击链路自动生成平台) [CP]. Bo Ye, Wei Zhang, Jianqiang Qu. 2021SR1816116.

- [29] Industrial Control System Network Topology Drawing Platform (360 工 控 网 络 拓 扑 绘 制 平 台) [CP]. Bo Ye, **Wei Zhang**, Tian Long. 2021SR1816115.
- [30] An Interactive AI System Software Featuring Dynamic Facial Expression Recognition and Voice Chatting[S]. **Wei Zhang**, Xiaoying Deng, Wanting Liu. 2019R11S0455591.
- [31] A System Software Used in a Bluetooth-controlled Car for Authentication Based on Dynamic Facial Recognition[S]. **Wei Zhang**, Fuzhou Shen, Xiaoying Deng, Lei CHEN. 2019R11S0455589.
- [32] An Eco-regulation System Based on Internet and Real-time Monitoring[S]. S Fan, J Sun, Fuzhou Shen, Wei Zhang, 2019SR0619769.
- [33] A Smart Car System with Tracing and Photography Functions[S]. Fuzhou Shen, Wei Zhang, Saibo Fan, Lei Chen. 2019SR0676736.
- [34] A 3D Dynamic Display System Based on Intelligent Voice[S]. Wei Zhang, Fuzhou Shen, Ce Sun, et.al. 2019SR0223080.
- [35] A Robot Control System Server Based on WebServer Technology[S]. Wei Zhang, Xiaofeng Yang, Xiaoying Deng. 2018SR879516.
- [36] An Intelligent Rainbow Light System Software Based on Wi-Fi Module[S]. Shaowei Qian, X. Ge, Wei Zhang, et.al. 2018SR773134.

Awards & Honors

•	National 2nd Prize , the 2nd National University Contest on Intelligent Robotic Innovations.	Team Leader	2019.05
•	National 2 nd Prize, 2018 National College Students' FPGA Innovation Design Competition.	Team Leader	2018.12

- National 3rd Prize, 1st Prize in East China, 2019 "Discovery Cup" Software Design Competition of National College Students' "Internet Plus" Innovation Contest, National College Student Electronic Design Competition (Provincial 2nd Prize)
 Team Leader 2019.04
- National Encouragement Scholarship (5%); Fei Xiao-Tong Scholarship of Morality Cultivation (1/794) 2017.11&2018.11
- Great Title of "New Youth for a Powerful Nation" of National Summer Voluntary Teaching (selected among 300 people nationwide by the Department of Schools of Central Committee of the Communist Youth League of China, China Youth Daily and people.cn)
 2018.10
- East China Region 2nd Prize, National College Student Embedded Chip and System Design Competition and Smart Interconnect Innovation Competition

Fundings

Provincial College Students' Innovative Entrepreneurial Training Program,

2019.05 - 2020.05

Yangzhou Maiwei Microelectronics Co., Ltd., No. 201911117138T, Principal Investigator

School-level College Students' Innovative Entrepreneurial Training

2018.05 - 2019.05

- A Design of Indoor Self-navigating Meal Delivery Robot Based on Facial Recognition, No. x20180186, Principal Investigator
- E-reading Aids for Visually Impaired People Based on Optical Character Recognition (OCR) and Text to Speech (TTS) Techniques, No. x20180186, Participator

Social Practice and Volunteer Experiences

CSND Certified Blog Expert, Chinese Software Developer Network, the world's largest Chinese IT technology exchange platform 2021.04

- TechBloger, focus on machine learning, computer vision
- Followers: 15.2 k+

Maiwei AI Lab Builder, Open Source Community, which focus on computer vision, link: https://github.com/MaiweiAI 2020.08 - present

Technical Blog Analyst, Global Affairs, Synced Technology 2020.08 - present

Vice-advisor, Ant Academic Study Center 2020.07 - present

Volunteer Experiences (OVER 250 hours of volunteer services) 2018.07 – 2020.06

ABILITY

- 熟练使用 C/C++编程语言,有良好的编码习惯,掌握性能分析、优化技巧;
- 熟悉交叉编译和嵌入式系统,熟悉编译构建系统 Bazel\CMake\Conan, GDB 调试、Profiling 工具使用;
- 熟悉脚本编写 Python、shell, 熟悉 Docker 容器化技术;
- 熟悉多线程、高并发编程,熟悉常见系统架构及设计模式;
- 熟悉 Linux 内核并熟练使用 Linux 性能分析工具 perf、gperftool、Trace、eBPF
- 测试驱动开发,闭环思维。熟练 GTEST 单元测试、benchmark 和持续化测试,掌握 DevOps 技术;
- 具有机器学习、深度学习算法项目经验,了解 PyTorch 框架,CUDA 编程;