张 伟 (Charmve)

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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 also received 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 for autonomous vehicles.

Employment

系统优化工程师 **Onboard Infra & System / 轻舟智航 QCraft** **江苏苏州 2022.04-present**

- 负责系统模块的 porting 适配于不同软硬件平台，实现智能驾驶 L3~L4 级别软件量产解决方案；
- 负责系统 Observability 的相关工具搭建，发现系统性能的瓶颈，形成平台性能力输出；
- 负责复杂系统 CPU、GPU、MEM 以及 IO 资源优化，系统稳定性、执行时间优化。

高级软件研发工程师 **Mpilot / Momenta** **江苏苏州 2021.09-2022.04**

- 天马山 L 项目成员，负责智能驾驶软件系统在 Al 计算平台上的自动化集成部署，构建智能驾驶计算平台软件解决方案，包括英伟达-Orin/Xavier、华为 MDC 等车载嵌入式计算平台；
- 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/C++性能优化，算法移植部署；
- 带领团队完成多个 millstone 交付，获得 2021 年度最佳平台贡献奖、CEO 嘉奖令。

软件研发工程师 **未来安全研究院 / 奇虎 360** **北京 2020.07-2021.09**

- UnicornTeam 队员，研究方向为无线电安全和漏洞安全；
- 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 60 万元创收。
- 第二个负责的项目为面向攻击者视角下的工业互联网安全评估平台，通过主被动方式，静态扫描工控场景下设备的网络安全状态，建立网络拓扑图，基于漏洞匹配 CVE 和 ATT&CK 技战术建立攻击链路，基于知识图谱建立整个网络拓扑结构中的安全评估，完成网络安全感知和风险控制解决方案。
- 该项技术平台已经成功在多家工业企业投入使用，个人申请 3 项发明专利和 2 项软件著作权，成功为公司带来百万级盈利。

创始人 **扬州迈微电子科技有限公司** **江苏扬州 2018.08-2020.07**

- 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。与此同时，公司团队成员的学术科技成果又反哺于公司业务，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；年利润达 26 万。

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** **2016.09-2020.06**

- 连续三年国家励志奖学金、唯一一名双收国家级奖学金和费孝通奖学金获得者，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；
- 发表 SCI 及中文核心期刊四篇、申请发明专利 13 项、授权软件著作权 9 项，发布专著一部。

扬州大学，外国语学院 **双学位** **2017.09-2020.06**

- 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目** **2019.01-2019.02**

- 入选江苏省大学生万人计划，作为本校唯一一名本科生入选，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初探”，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*” [J]. 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*” [J]. Internet of Things Technologies. 2022,12(03):4-6.DOI:10.16667/j.issn.2095-1302.2022.03.001. [**Paper**] | [GitHub]

[4] **Wei Zhang**. “*A Simulated Electromagnetic Curved Shooting Gun Based on Monocular Ranging: Design and Implementation*” [J]. 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* [J]. 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] | 在线阅读 简体中文 | Stars 1.3k

Patents and Copyrights

★ 17 发明专利:

[6] **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)

[7] **张伟**. 基于 QEMU 的自动驾驶虚拟仿真系统设计[P]. (in Examination)

[8] **张伟**. 一种紧凑型数据回放协议及实现方法[P]. (in Examination)

[9] **张伟**. 漏洞匹配方法、装置、设备及存储介质[P]. PA21119974CN

[10] **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

[11] **张伟**. 一种图像嵌入盲水印的方法、攻击方式及系统[P]. PA21117882CN

[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**. 一种触控模组、系统及反馈控制方法[P]. 江苏省：CN113641261A,2021-11-12.

[14] 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

[15] 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

[16] **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

[17] **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

[18] **张伟**. 动态显示系统、装置及方法[P]. 江苏省：CN112530432A,2021-03-19.

[19] **张伟**. 一种显示阵列控制电路、装置及光立方 [P]. (in Examination)

[20] 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.

[21] 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.

[22] 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 软件著作权:

[23] **张伟**，叶波，屈健强. 360 工控网络攻击链路自动生成平台软件[CP]. 2021SR1816116.

[24] 叶波，**张伟**. 360 工控网络拓扑绘制平台软件[CP]. 2021SR1816115.

[25] **张伟**，邓小颖，刘婉婷. 一种动态表情识别的语音 AI 娱乐互动系统软件[CP]. 2019R11S0455591.

[26] **张伟**，邓小颖，陈磊. 一种动态人脸识别的蓝牙智能小车系统软件[CP]. 2019R11S0455589.

[27] An Eco-regulation System Based on Internet and Real-time Monitoring[CP]. S Fan, J Sun, Fuzhou Shen, **Wei Zhang**,. 2019SR0619769.

[28] A Smart Car System with Tracing and Photography Functions[CP]. Fuzhou Shen, **Wei Zhang**, Saibo Fan, Lei Chen. 2019SR0676736.

[29] A 3D Dynamic Display System Based on Intelligent Voice[CP]. **Wei Zhang**, Fuzhou Shen, Ce Sun, et.al. 2019SR0223080.

[30] A Robot Control System Server Based on WebServer Technology[CP]. **Wei Zhang**, Xiaofeng Yang, Xiaoying Deng. 2018SR879516.

[31] An Intelligent Rainbow Light System Software Based on Wi-Fi Module[CP]. Shaowei Qian, X. Ge, **Wei Zhang**, et.al. 2018SR773134.

Awards & Honors

- **2 National 2nd Prize**, Both the 2nd National University Contest on Intelligent Robotic Innovations and 2018 National College Students' FPGA Innovation Design Competition. **Team Leader** 2019.05
- **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 2019.10

Fundings

Provincial College Students' Innovative Entrepreneurial Training Program, Program Leader **2019.5–2020.5**

School-level College Students' Innovative Entrepreneurial Training, **2018.5–2019.5**

- 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**

Research Experiences

LightCube: A 3D Display System with Intelligent Voice Based on FPGA (National 2nd Prize) 2018.09-2019.05

- Surveyed the design and implementation of FPGA-based hardware accelerators under different platforms and network models over the past decade, and analyzed their differences, pros and cons.[1]
- Designed a full-colored 12*12*12 LED cube array
- Designed cascade driver circuit with low power consumption, and used it to connect multiple ready-made LED cubes to make up an advanced LED cube dynamic display system
- **Evolutionary work: A Voice Robot Based on Emotion Analysis (National 2nd Prize) [GitHub]** [25] **| [Paper]** [2] **| [Slides] | [Patents]** [18, 19]

A Design of Indoor Self-navigating Meal Delivery Robot Based on Facial Recognition (Awarded as Excellent Project) 2018.05-2019.05

- Familiar with Raspberry Pi, and used it to recognize simple facial expressions based on statistics of face feature points (accuracy rate: **86.3%**)
- Independently established LAN server based on Web Server [30] and realized robot's indoor self-navigation [3]
- A Smart Car System with Tracing and Photography Functions [28]
- A System Used in a Bluetooth-controlled Car for Authentication Based on Dynamic Facial Recognition [26]

GitHub Open Source: My research interests lie at Computer Vision and Machine Learning. 2017.09-present

- **Practicum4ECE:** Major Coursework Design Project (Ranking **1st** in All Major Courses Design Projects) [GitHub] 2017.09-2019.12
- **SNE-RoadSeg2: Available Freespace Detection.** PyTorch implementation of *SNE-RoadSeg: Incorporating Surface Normal Information into Semantic Segmentation for Accurate Freespace Detection*. [GitHub]
- **StegaStamp-plus.** The project explores hiding data in images while maintaining perceptual similarity. Our contribution is the ability to extract the data after the encoded image (StegaStamp) has been printed and photographed with a camera (these steps introduce image corruptions). [GitHub]
- **Try-On by StyleGAN Interpolation Optimization.** Personal repository for "*VOGUE: Try-On by StyleGAN Interpolation Optimization*" (CVPR 2021), which is a StyleGAN interpolation optimization algorithm for photo-realistic try-on. SOTA results for garments to deform according to the given body shape, while preserving pattern and material details. [GitHub]

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 Linux、QNX、ROS 系统，熟悉跨平台交叉编译 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，熟悉常见架构及设计模式；
- 测试驱动开发，闭环思维。熟练 GTEST 单元测试、集成测试，掌握 DevOps 技术；
- 具有机器学习、深度学习算法项目经验，了解 TensorFlow 框架，CUDA 编程；

Social Practice and Volunteer Experiences

TechBloger, focus on machine learning, computer vision [CSDN] | [Zhihu] | [Followers: **8.5 k+**] 2020.07-now

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