Jia Wan

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RESEARCH INTERESTS

- Software Engineering, Software Reliability and Security

EDUCATION

Queen's University **Sep. 2016 – Present**

- **Degree:** MSc
- **Major:** Computer Science

Huazhong University of Science and Technology **Sep. 2007 – Jun. 2009**

- **Degree:** MEng
- **Major:** Communication and Information Engineering
- **GPA: 87%**

China University of Geosciences **Sep. 2003 – Jun. 2007**

- **Degree:** BEng
- **Major:** Communication Engineering
- **GPA:** 83%

RESEARCH EXPERIENCE

Queen's Reliable Software Technology Group **Sep.2016**

Internet Technology and Engineering R&D Center, HUST **Sep. 2007 – Jun. 2009**

- ***BST Network Monitoring System Development:*** developed a network video surveillance system (called IP camera) based on ARM and Embedded Linux. IP cameras are now widely used at homes, offices and factories, with which users can capture real-time and dynamic pictures through the network.
  - ✧ Redeveloped the FFmpeg codec library to implement audio/video coding based on MPEG4
  - ✧ Transplanted and implemented the XML network communications control module
  - ✧ Built the SIP proxy server and MySQL modules and added authentication security features
  - ✧ Developed the windows client and implemented all required modules including GPS, SIP travel through NAT models
- ***Research On P2P Streaming Media System Model In Embedded Devices:*** Researched into a new P2P streaming media transmission system, which could support the streaming media distribution that allowed a large number of IPTV users to watch at the same time.
  - ✧ Built the system model and studied the communication mechanisms between all nodes
  - ✧ Researched the scheduling algorithms and buffering mechanisms of nodes
  - ✧ Implemented the system in an embedded device through C language programming

Information Technology Lab, CUG Jul. 2006 – Jun. 2007

- ***SIP-based VOIP:*** Researched and developed a SIP-based VOIP network telephone system which had been launched to China's market.
  - ✧ Learnt about the basics of SIP signalling and implemented the SIP signalling module
  - ✧ Implemented the SIP proxy server i.e. user authentication, signaling delivery and forwarding
  - ✧ Solved the NAT traversal of SIP problem
- ***Injection Molding Workshop Internet of Things Project:*** Developed the workflow control system which connected the machine control system to the network to allow the workers to accomplish injection molding process and product management remotely
  - ✧ Developed the programs including RF card reading, screen display and network data transfer modules based on ARM using C language
  - ✧ Designed and implemented the IOCP server in C language for Windows

INDUSTRIAL EXPERIENCE

Android Engineer, IQIYI Corporation(shanghai) Jun. 2014 – Aug. 2016

Duty: *Android system and system app development for IQIYI TVGUO (a device like Chromecast)*

- ***Multiscreen Project Development:*** developed a system app on box and a protocol plug-in library for mobile application based on DLNA technology to share the digital media content (Movies, Music or Pictures) from phone to the TV screen
- ***Voice Recognition Application:*** developed a mobile app and a system app for box to integrate voice wakeup, voice recognition, speech synthesizer so as to control the behaviors of box like movie selection by voice, operation guidance, etc.

Android Framework Senior Engineer, Intel Asia-Pacific Research & development Ltd Oct. 2012 – Jun. 2014

Duty: *Android framework development on Intel phone/tablet boards based on Atom series CPU*

- ***Framework/App Debugging and Patching:*** solved issues like memory leak problems, instability and bad user experience (SystemUI, Gallery and Camera etc.). Submitted related patches to google android open source gerrit and patches have been approved and merged in the latest android system.
- ***Multi-window UI Solution Design for Tablets:*** designed the UI and animation of the windows; Developed a multi-window demo designed for Application Engineer for exhibition
- ***Multi-display Demo Implementation:*** developed a demo supporting multi-display with multi-touch and different apps are responding to interaction synchronously on different screens.

Linux BSP Engineer, Marvell Technology Group Ltd.(Shanghai) Jun. 2009 – Oct. 2012

Duty: *PXA9xx and Armada series BSP development and technical supports*

- ***Power Management Driver Development:*** developed the drivers for PXA9xx series chips to enable dynamic frequency scaling and power saving modes management in Android devices
  - ✧ Designed the clock tree architecture to control modules' clocks
  - ✧ Implemented the system reboot and power off process
  - ✧ Conducted statistics on DDR, VPU, GPU performance, analyzed the statistical data and designed dynamic frequency management schemes to save power
  - ✧ Developed power management interfaces for engineers to debug and analyze
- ***Camera Driver Development:*** developed camera drivers for PXA9xx and Armada series chips which support front and rear cameras on mobile phone reference design platforms
  - ✧ Aligned camera sensor driver to support one sensor on different platforms
  - ✧ Wrote camera driver usage code for QA and HAL engineers' reference
  - ✧ Subscribe Linux media mailing-list, submit camera driver, report problems about common interface to open source community and patches proved
  - ✧ Gained solid knowledge about Linux media V4L2 and videobuf2 architecture
- ***Technical Supports for RIM:*** went to Canada for two months acting as technical support engineer to provide technical supports for RIM in developing Linux camera drivers, power management drivers and kernels (Nov. 2010 – Dec. 2010)

PROFESSIONAL SKILLS

- **Android Framework and Application Development (3 years of development experience)**
  - ✧ Framework GUI, multimedia framework, Input system, WMS, AMS, DMS development for feature differentiation; Surface Flinger, Binder architecture
  - ✧ Android system and application development, DLNA, UPNP technology
- **Linux BSP Development (3 years of development experience)**
  - ✧ Linux camera framework V4L2 and its open projects: soc-camera, media controller

- ✧ Linux power management architecture, such as cpufreq, cpuidle, devfreq, etc.
- ✧ Linux drivers like I2C, RTC, keypad, touch screen, charger, battery, GPIO, LCD, sensor etc.

❖ **Linux Network Programming (2 years of development experience)**

- ✧ Embedded environment and network domain development; TCP/IP protocol stack; Linux network and multi-thread programming

❖ **Programing Languages and Scripts**

- ✧ C, C++, Java, JavaScript, Python, shell script, git integration

PUBLICATION

❖ ZUO Dong-hong, **WAN Jia**.A p2p media streaming delivery scheduling algorithm for embedded system[J]. Journal of Chinese Computer Systems, 2009, 30(9):1882-1884.

HONOURS AND AWARDS

❖	Excellent Graduate Student of HUST	Top 5%	2009
❖	“Merit Graduate Student” of HUST	Top 5%	2008
❖	First-Class Scholarship for Graduate Student	Top 5%	2008
❖	First-Class Scholarship for Graduate Student	Top 5%	2007
❖	Recommended Exam-exempted Graduate Student for HUST	Top 2%	2007

附录见下页：

VOIP 项目：

项目名称及说明	基于 SIP 信令的 VOIP 网络电话
直接负责人及职位	黄鹰　　信息工程学院 信息工程系 副主任教授
申请人担任职位	组长及研发人员
开发时间（项目起止时间及申请人参与起止时间）	2006.12 至 2007.6
参与人数	7
项目目的	研究基于 SIP 信令的 VOIP 网络电话系统及实现
项目发展或预期（prospective）	基于该 SIP 信令的 VOIP 网络电话盒子已经量产。
项目内容(项目组的主要工作及申请人所参与的具体工作)	项目主要工作： 1. 实现一个VOIP网络电话，集成网页配置模块，SIP信令模块，RTP语音通话，传真模块； 2. 实现SIP代理服务器，及NAT穿越及定位网络电话的实现。

	申请人参与的工作： 1. SIP信令调研，熟悉SIP各种信令及使用方式； 2. 实现VOIP网络电话中SIP信令模块的实现； 3. 实现SIP代理服务器，包括用户认证，信令投递转发等功能； 4. 实现使用SIP协议来穿越NAT的功能。
运用技术(软件、工具等)	嵌入式设备开发，C 语言。 Linux 上网络编程及多线程编程 TCP/IP 协议栈 Linux 上 MySQL 命令编程 MySQL 数据库操作 shell 脚本设计测试用例
研究方法/步骤	1. 熟悉 SIP 信令各种协议消息的使用场景； 2. 研究流行的 OSIP2 包，协议栈； 3. 研究 SIP 代理服务器 partysip 模型； 4. 使用基于 OSIP2 开发库完成 VOIP 盒子上信令模块的开发； 5. 基于 partysip 模型实现代理服务器上用户注册，认证，信令转发，SIP 穿越 NAT 功能； 6. 设计代理服务器上的数据库模块并实现。
创新点	1. 使用 SIP 信令实现盒子之间，盒子与代理服务器之间的消息交互； 2. 将代理服务器与数据库服务器合并完成用户信息备份，查阅等功能。
障碍困难(困难描述及解决方案)	1. 在盒子上 SIP 信令模块的开发上，在引入 OSIP2 库上遇到了很多程序上编译出错的问题，查阅相关工具书籍，最终解决。 2. 在数据库的操作上，参阅书籍，完成各功能的 MySQL 操作指令实现。
项目最终的结果	项目方案已被企业采用
项目收获(最好是学术上或技术上的收获，感悟也是可以的)	1. 熟悉编程语言，Linux 下编程，MySQL 数据库命令； 2. 将项目所学付诸于实践，比如在 SIP 协议的实际使用，开源的 SIP 库的研究，代理服务器的功能； 3. 与项目同学一起协作，探讨，优化已有方案。
其他补充	

P2P 项目：

项目名称及说明	嵌入式设备中的 P2P 流媒体系统模型研究
直接负责人及职位	**程文青** 华中科技大学 电子信息与通信学院 **副院长** **教授**
申请人担任职位	研究人员
开发时间（项目起止时间及申请人参与起止时间）	2008.8 至 2009.6
参与人数	2
项目目的	研究一种新的 P2P 流媒体传输系统，能支持大量 IPTV 用户同时观看的流媒体分发方式。
项目发展或预期（prospective）	嵌入式 P2P 流媒体系统模型研究，各端初步实现
项目内容(项目组的主要工作及申请人所参与的具体工作)	项目主要工作，及申请人的具体工作 1. 模型系统建模； 2. 研究各端工作及通信机制； 3. P2P调度算法研究； 4. 节点缓冲机制的实现； 5. 各端具体实现（采集节点，索引和缓冲服务器，一般节点）。
运用技术(软件、工具等)	嵌入式设备开发，C 语言。 Linux 上网络编程及多线程编程 Linux 上 MySQL 命令编程 MySQL 数据库操作 视频编解码工具 shell 脚本设计测试用例
研究方法/步骤	1. 研究典型的 P2P 流媒体系统 Coolstreaming，并分析其消息结构，调度算法，节电管理机制； 2. 开销大的节点模块不适合放入嵌入式系统中实现，设计并实现索引服务器； 3. 实现一般节点的邻居节点管理模块，一般节点的缓存机制，调度算法； 4. 以视频监控为场景，实现采集节点为视频内容的采集端； 5. 节点之间的媒体信息的传输方式及协议定制；

	6. 各端 C 语言编程实现。
创新点	该 P2P 流媒体系统模型可解决传统模式所带来的问题，并且节点开销小，有较强的可扩展性，符合嵌入式系统应用，同时此方案也为其它嵌入式 P2P 流媒体分发系统的设计与实现提供一个参考。
障碍困难(困难描述及解决方案)	1. 调度算法的设计，开始各节点端有卡顿现象，发现是由于媒体块的缺失导致，各节点的网络情况不稳定，导致所获取的媒体数据块未及时到达。设计接收节点根据服务节点的网络速度来请求不同媒体块的方法来解决。 2. 一般节点缓存区的设置，媒体块的提取方法，经过数次实验，优化媒体块大小，缓冲区策略。
项目最终的结果	各端已经完成模型实现
项目收获(最好是学术上或技术上的收获，感悟也是可以的)	《一种 P2P 流媒体分发调度算法在嵌入式系统中的实现》，被核心期刊——《小型微型计算机系统》录用
其他补充	