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Brief

I launched my career on developing embedded devices using Unix-like kernel at Ricoh Company, Ltd. The experience was not only for designing device drivers but also including debug of virtual memory. And I have experience in IoT platfom such like ARM Cortex-M MCU and RTOS. Also I learned application design using functional language such like Haskell, and published some research papers[1] about such languages.

Skill Set

Deep knowledge for Unix-like Kernel and User Space

I am an expert for Unix-like kernel such like Linux, because I provided technical support for NetBSD, which is a Unix-like OS similar to Linux, at Ricoh. My skill is not only for NetBSD but also Linux. In fact, a race condition bug in PowerPC Linux kernel was fixed by me in only five days at MIRACLE LINUX.

Wide experience in IoT platform

I have a wide experience in IoT platform such like FreeRTOS, ChibiOS/RT[2], ARM Cortex-M, ESP8266, AVR and MSP430. Also I launched a new IoT business using TWELITE wireless platform[3] at Centillion Japan.

Leadership

I was leading a technical team of twenty people to support the OS at Ricoh. And also I have experience in leading offshore team in china to maintain web application at Centillion Japan.

Research Security and Quality

A prototype of own Secure-OS similar to OP-TEE[4] was designed by me at SELTECH. It runs with the other RTOS on ARM Cortex-M MCU. Also I have a wealth of experience in strong static typing language such like Haskell and verification of C language such like VeriFast[5], which are useful to keep the quality of products.

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[1] http://www.metasepi.org/papers.html
[2] http://www.chibios.org/
[3] https://mono-wireless.com/
[4] https://github.com/OP-TEE/optee_os
[5] https://github.com/verifast/verifast

Work Experience

July 2013 - Present: Self-employed Researcher at METASEPI DESIGN

- Research and develop Ajhc Haskell Compiler[6]
- Host meetup[7] for hands-on to verify embedded application on ARM Cortex-M using STM32[8] board and ST-LINK[9] debugger
- ATS language evangelist[10][11] for embedded devices
- Verification evangelist using VeriFast, which is a verifier C language programs annotated with preconditions and postconditions
- Translated VeriFast Tutorial into Japanese[12]
- Support to develop any embedded software
- Manage Metasepi Project[13] and develop the core technology

August 2014 - October 2017: Part-time Researcher at RIKEN Advanced Institute for Computational Science

- Research embedded functional programming running on ARM Cortex-M and AVR
- Verification for RTOS application such like ChibiOS/RT running on ARM Cortex-M

November 2016 - October 2017: Expert Engineer (permanent employee) at SELTECH CORPORATION

- Maintain a Hypervisor for embedded market
- Design and develop own Secure-OS for ARM platform

February 2016 - November 2016: Software Engineer (contract employee) at Life Robotics Inc.

- Design GUI application running on Linux OS, using C++ and Qt[14]
- Design network protocol for Robotics application
- Reason for Quitting: to challenge verification of secure application using C language and VeriFast

[6] http://ajhc.metasepi.org/
[7] https://metasepi.connpass.com/
[8] http://www.st.com/en/microcontrollers/stm32-32-bit-arm-cortex-mcus.html
[9] http://www.st.com/en/development-tools/st-link.html
[10] http://www.ats-lang.org/
[11] http://jats-ug.metasepi.org/
[12] https://github.com/jverifast-ug/translate/blob/master/Manual/Tutorial/Tutorial.md
[13] http://www.metasepi.org/
[14] https://www.qt.io/

March 2015 - February 2016: System Enginner (contract employee) at Centillion Japan Co., Ltd.

- Technical support for stock chart application using JavaScript
- Maintain MySQL database servers
- Launch new IoT business for farming
- Design a platform[15] to accelerate R programs
- Reason for Quitting: to change my job into embedded one, again

September 2014 - December 2014: Software engineer (trustee agreement) at Axsh co., LTD.

- Develop an OpenFlow application named "OpenVNet"[16]
- Design automation scripts for AWS using Ruby and GNU make
- Reason for Quitting: to have better salary

March 2012 - July 2013: Software Engineer (permanent employee) at MIRACLE LINUX CORPORATION

- Maintain own Digital Signage platform running on Intel architecture using Linux OS, C++, OpenGL, GTK+[17] and GStreamer[18]
- Verify and tune up performance of Digital Signage on new Intel platform and Intel video driver
- Verify PowerPC Linux kernel and debug/fix a race condition in the SMP kernel
- Debug and fix bug of crash[19] command's PowerPC virtual memory paging
- Design new Windows installer using NSIS[20]
- Introduce and maintain new Git server for internal use
- Reason for Quitting: to focus researching and developing Ajhc Haskell compiler on full-time work

April 2001 - February 2012: Software Development Engineer (permanent employee) at Ricoh Company, Ltd.

- Develop BIOS and bootloader for multifunction printer on Intel architecture
- Design secure boot for multifunction printer on Intel architecture
- Develop new BIOS for multifunction printer
- Tune multifunction printer boot time as 10 seconds
- Develop POSIX thread library

[15] `https://github.com/centillion-tech/kick-r`
[16] `https://github.com/axsh/openvnet`
[17] `https://www.gtk.org/`
[18] `https://gstreamer.freedesktop.org/`
[19] `http://people.redhat.com/~anderson/`
[20] `http://nsis.sourceforge.net/`

- Develop and technical support NetBSD OS
- Port OS to new Intel hardware
- Reason for Quitting: to join more small and quick team

Education

- March 2001: Master of Engineering from Department of Electrical and Electronic Engineering, Tokyo Metropolitan University.
  The thesis: "Multimode Quartz Crystal Microbalance"[21]

Publications and Reports

- Kiwamu Okabe and Hongwei Xi. "Arduino programing of ML-style in ATS"[22]. ML workshop, 2015.
- Kiwamu Okabe and Takayuki Muranushi. "Systems Demonstration: Writing NetBSD Sound Drivers in Haskell"[23]. Haskell Symposium, 2014.
- Kiwamu Okabe. "ATS 言語を使って不変条件を API に強制する".[24] 夏のプログラミング・シンポジウム 2014, 2014.
- Kiwamu Okabe, Hiroki MIZUNO and Hidekazu SEGAWA. "強い型による OS の開発手法の提案"[25]. 第 55 回プログラミング・シンポジウム, 2014.

Activities

Open-source projects

Metasepi Project[26]

- Challenge to create an open-source Unix-like operating system designed with strong type such as ML or Haskell.
- Rewriting NetBSD kernel using Ajhc Haskell compiler. `https://github.com/metasepi/netbsd-arafura-s1`

Ajhc Haskell compiler[27]

- Extend and add embedded features to Jhc Haskell Compiler `http://repetae.net/computer/jhc/`.
- Ajhc has thread-safe and reentrant runtime. Also has Erlang style GC. It means Ajhc's Haskell context has own GC heap. GC can run on tiny CPU such as Cortex-M3 with 32kB RAM.

Japan ATS User Group[28]

- An user group for ATS language promotion of utilization. Translating ATS documents into Japanese.

[21] `http://ci.nii.ac.jp/naid/110004076869`
[22] `http://www.metasepi.org/doc/metasepi-icfp2015-arduino-ats.pdf`
[23] `http://metasepi.org/doc/metasepi-icfp2014-demo.pdf`
[24] `http://www.metasepi.org/doc/20141101_prosym_summer2014.pdf`
[25] `http://metasepi.org/doc/20140110_prosym55.pdf`
[26] `http://metasepi.org/`
[27] `http://ajhc.metasepi.org/`
[28] `http://jats-ug.metasepi.org/`

Debian Maintainer[29]

- Maintained uim package at Debian squeeze, and packages using Haskell at sid.

Carettah[30]

- A presentation tool written with Haskell. All of my slides[31] are created by the tool.

Computer Skills

- Languages: C, C++, Haskell, Intel/ARM assembler, Ruby, OCaml, Python, Erlang, JavaScript, R
- Platforms: Linux, NetBSD, FreeRTOS, ChibiOS/RT, Android NDK, Cygwin, MinGW, Bare metal

Reference available upon request

- Shoi Egawa CEO - SELTECH CORPORATION
- Woo-Keun Yoon CEO - Life Robotics Inc.
- Kentaro Kuroiwa Research Chief - Centillion Japan Co., Ltd.
- Yasuhiro Yamazaki CEO - Axsh Co., Ltd.
- Junichiro Makino Team Leader - RIKEN Advanced Institute for Computational Science
- Takashi KODAMA CEO - MIRACLE LINUX CORPORATION
- Shigeya SENDA - Ricoh Company, Ltd.
- Hitoshi Sekimoto Professor - Tokyo Metropolitan University, Department of Electrical and Electronic Engineering

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[29] `http://qa.debian.org/developer.php?login=kiwamu@debian.or.jp`
[30] `https://github.com/master-q/carettah`
[31] `http://www.slideshare.net/master_q/`