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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 as ARM Cortex-M MCU and RTOS. Also I learned application design using functional language such as 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 as 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 as 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 as Haskell and verification of C language such as 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: Freelance Researcher

Responsibilities:

- Researching and developing Ajhc Haskell Compiler[6]
- ATS language[7] evangelist for embedded devices
- Verification evangelist using VeriFast[8], which is a verifier C language programs annotated with preconditions and postconditions

Key Achievements:

- Published some research papers[9]
- Translated ATS documents[10] into Japanese
- Translated VeriFast documents[11] into Japanese

February 2018 - July 2018: Software Architect at SHINKAWA LTD.

Responsibilities:

- Researched and developed new software platform for wire bonding during semiconductor device fabrication

Key Achievements:

- Created a parser to understand SHINKAWA own embedded script language
- Evaluated EtherCAT[12] protocol for the realtime application

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

Responsibilities:

- Researched functional programming for embedded platform

Key Achievements:

- Published some research papers[13]

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

Responsibilities:

- Researched and developed new Secure-OS for ARM Cortex-M platform

[6] `http://ajhc.metasepi.org/`
[7] `http://www.ats-lang.org/`
[8] `https://github.com/verifast/verifast`
[9] `http://www.metasepi.org/papers.html`
[10] `http://jats-ug.metasepi.org/`
[11] `https://github.com/jverifast-ug/translate`
[12] `https://www.ethercat.org/`
[13] `http://www.metasepi.org/papers.html`

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

Responsibilities:

- Developed GUI application running on Ubuntu OS, using C++ and Qt[14] for single arm robot

Key Achievements:

- Designed a network protocol for the robotics application

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

Responsibilities:

- Technical support for stock chart application using JavaScript
- Maintained MySQL database servers
- Manager for offshore development in China

Key Achievements:

- Launched new IoT business for farming
- Design a platform[15] to accelerate R programs

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

Responsibilities:

- Developed an OpenFlow application named "OpenVNet"[16]

Key Achievements:

- Provisioned and automated deploying the OpenVNet on AWS platform using Ruby and GNU make

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

Responsibilities:

- Developed own Digital Signage platform running on Intel architecture using Linux OS, C++, OpenGL, GTK+ and GStreamer
- Supported and debugged own Linux distribution

Key Achievements:

- Debugged and fixed a race condition in the SMP kernel on PowerPC platform
- Debugged and fixed bug of crash[17] command's PowerPC virtual memory
- Designed new Windows installer using NSIS[18]

[14] `https://www.qt.io/`
[15] `https://github.com/centillion-tech/kick-r`
[16] `https://github.com/axsh/openvnet`
[17] `http://people.redhat.com/~anderson/`
[18] `http://nsis.sourceforge.net/`

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

Responsibilities:

- Developed own platform for multi-function printer based on NetBSD OS

Key Achievements:

- Developed OptionBIOS and bootloader for the platform on Intel architecture
- Designed secure boot for the platform on Intel architecture
- Compressed boot time of the printer onto 10 seconds
- Verified m:n POSIX thread library

Education

- March 2001: Master of Engineering from Department of Electrical and Electronic Engineering, Tokyo Metropolitan University.
  The thesis: "Multimode Quartz Crystal Microbalance"[19]

Publications and Reports

- Kiwamu Okabe and Hongwei Xi. "Arduino programing of ML-style in ATS"[20]. ML workshop, 2015.
- Kiwamu Okabe and Takayuki Muranushi. "Systems Demonstration: Writing NetBSD Sound Drivers in Haskell"[21]. Haskell Symposium, 2014.
- Kiwamu Okabe. "ATS 言語を使って不変条件を API に強制する".[22] 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"[23]. 第 55 回プログラミング・シンポジウム, 2014.

Activities

Open-source projects

Metasepi Project[24]

- 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`

[19] `http://ci.nii.ac.jp/naid/110004076869`
[20] `http://www.metasepi.org/doc/metasepi-icfp2015-arduino-ats.pdf`
[21] `http://metasepi.org/doc/metasepi-icfp2014-demo.pdf`
[22] `http://www.metasepi.org/doc/20141101_prosym_summer2014.pdf`
[23] `http://metasepi.org/doc/20140110_prosym55.pdf`
[24] `http://metasepi.org/`

Ajhc Haskell compiler[25]

- 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[26]

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

Debian Maintainer[27]

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

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

- Hiroshi Munakata CTO - SHINKAWA LTD.
- 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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[25] `http://ajhc.metasepi.org/`
[26] `http://jats-ug.metasepi.org/`
[27] `http://qa.debian.org/developer.php?login=kiwamu@debian.or.jp`