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| Name | Stefanos Kornilios Mitsis Piitidis |
| Address | Burstwiessenstrasse 19, 8055 Zürich, Switzerland |
| Phone | +41 789620213 |
| e-mail | skmp@nillware.com |
| Skype | drkiiraziel |
| GitHub | https://github.com/skmp |


## Work Experience

**2013 – Ongoing** — Freelancing & Consultant services (nillware) – Founder

Open Source development, freelancing and consultant services.

Notable projects

- Reicast, a multiplatform dreamcast emulator (Open Source project)
- Porting of monogame to mono-aot for psvita (for Blit Software)
- Printing server for PoS systems (for Cluey)
- H264/AAC/RTMP encoding framework for iOS (for Camerize)

**2014 – Ongoing** (9 months) — Panter AG – Javascript, PHP and Ruby on Rails Developer

Projects

- PHP framework re-design, templates for the getBUTIK.com e-shop & inventory management platform
- Meteor based single-page applications

**2013 – 2014** (11 months) — Front & Back end web service optimization (Missum)

Optimised backend code by porting to C++ some key functions written in ruby. Also dramatically improved front end performance by moving the layout to javascript and removing bloat.

**2010, 2011** (1 + 9 months) — Android Developer (AtGames)

Sponsored development of nullDCe, covering speed optimization, improved arm and OpenGL ES support

**2008 – 2013** — Software/Hardware design and IT support (Aloupis Radios) – External Contractor

Hardware design and software implementation for various ROIP/VOIP embedded linux projects, typical IT responsibilities

**2006 – 2008** — C/C++ Programmer (Nanotech entertainment) – External Contractor

*3D Arcade game development using OpenGL and Linux*

*Multi-head synchronized video player*

## Skills

**Programming**

In depth knowledge of various flavors of assembly, C/C++, C#, HTML/JS

Expertise at debugging complicated, embedded systems, even without a debugger

Expertise at JIT compilers, dynamic binary analysis and runtime generated code

Working knowledge of Java, Verilog, digital electronics

**Project Management**

Agile development using the SCRUM framework

**Platforms**

Windows, Android, Linux (incl. building large projects/kernel/gcc)

**Tools**

Visual Studio, IDA Pro, OllyDbg, Wireshark, GNU make & related utilities, Eclipse, Xilinx ISE Suite

## Current Interests

JIT/flow-based optimizations, Team coordination & Motivation, Real-time web & could compute, static meta-programming

## Notable Personal & Open Source Projects

2011 – Ongoing

### Reicast (http://goo.gl/uA8l6D) – Main developer, coordinator

Reicast is the only dreamcast emulator for android, works fullspeed on current low-end arm cpus and has almost 500K downloads on the play store. It has complete jit backends for arm and x86, and various levels of fallback for other architectures. Apart from android, it also runs on windows, linux, iOS (needs jailbreak for jit), windows phone (via ANGLE, needs devtools), html5 (via emscripten) and pnacl. It also features a non-jit dynarec core that is up to 5x faster than a typical interpreter.

The project has been in development for many years (some of it sponsored), and is the successor to nulldc/nulldce. It is considered one of the most efficient emulators for android and one of the few practical, open source, IL-based designs with backpatching and extensive code rewritting.

2011 – 2014

### Kinect & NUI – Co-developer

This is was series of projects developed around the kinect depth camera

Intrael (http://goo.gl/vJWpqs) is fast a depth image blob scanner, with a flexible json api, Lua-vision is a lua module based loosely on the original intrael engine. I helped with speed optimisations and various design ideas, as well as some demos.

2004 – 2012

### nullDC/nullDCe (http://code.google.com/p/nulldc/) – Main developer

I was the main and mostly solo developer of nullDC, a very popular Dreamcast emulator. The project involved emulating the SH4 and ARM cpus, the PowerVR gpu, and almost every other aspect of the original Dreamcast hardware. Notable parts of the projects included an SH4 emulator, x86 runtime assembler, a SH4 -> x86 JIT optimising translator which uses dynamic binary analysis, a novel virtual memory implementation, 3d emulation via opengl, reverse engineering of many hardware details, including a mostly undocumented dsp. While the project was initially closed source, I open sourced it in 2010.

Working in a private port I added host support for psp, wii, ps3 and arm, although only mips and arm were relatively complete. The project eventually forked into reicast.

During the development of the project a lot of utilities were developed, including a sh4 disassembler/debugger, a gdb bridge and a real-time profiler for android. For reverse engineering, performance analysis, as well as debugging crash-report images on embedded platforms, IDA and a couple of purpose built tools were used.

Some of the most interesting discoveries were published on my old blog, which still survives on the internet archive (http://goo.gl/qwQTZJ)

2009 – 2010

### PCSX2 (http://code.google.com/p/pcsx2/) – Mentoring, Virtual memory design, Ethernet emulation

A ps2 emulator for PCs. I helped with the design of the JITs and provided general advice and mentoring to the project. I also designed and implemented the virtual memory emulation code in the rewrite of 2009. In conjunction with some other team members we emulated the network adapter which, after countless hours of debugging, allowed us to play Monster Hunter Online using the emulator on a server populated with players playing from their PS2s.

2004 – 2005

### ThunderVB (http://sourceforge.net/projects/thundervb/) – Co-Developer

A set of extensions for the Visual Basic 6 IDE and compiler that enabled mixing assembly, C and VB6 source code inside the Visual Basic IDE. This was achieved by compiling assembly, Visual Basic and C code independently, and then mixing and linking them together to produce the desired result. The project also supported full colouring and intellisense support for assembly and basic colouring for the C code, which was achieved by hooking/detouring various winapi functions.

This project required a great insight into the VB6 IDE, compiler and runtime, which was gathered mostly by debugging and reverse engineering the relevant parts.

The project won a Planet Source Code “Project of the month” award in 2005.

2002 – 2004

### BasicBoy (psc.com project) – solo project

A fairly complete gameboy/gameboy color emulator I developed during high school. This was my first hands-on experience with moderately complex hardware concepts (z80, assembly, clocks, raster graphics, sound synthesis, etc).

## Educational/Academic Projects & Events

2013 – 2014 (stalled)

### “Customized OpenRISC SoC with virtualization extensions” – WIP

An extension of the base OpenRISC platform to add associative arrays as a first class primitive. Currently, while most CPUs use a lot of associative arrays internally, these are usually hidden away as “implementation details”. I added some extensions to expose this functionality, as well as modified the linux kernel and gcc to recognize the instructions. I am currently in the process of evaluating performance gains for associative lookups in virtualization, and other generic uses of such a construct.

2013

### Simple SoC (https://github.com/pld-lessons/simple_soc)

A Simple, custom system on a chip we developed in hsgr in order to study verilog and hardware design. I was responsible for coordination and giving the general direction to the project. We designed, implemented and verify the implementation, created all the required tools (assembler, debugger, etc) and a reference implementation (interpreting emulator). We also had some university students that attended the event as an extension to the digital logic presentations I did earlier in 2013.

2010 – Ongoing

### Hackerspace.gr – Member

Member of Athens’ only hackerspace, since its inception. I have helped in the management of the space and organized numerous events and projects. I was the coordinator of the Simple SoC project, PLD lessons as well as the Quadrotor and Bitcoin groups.

2010 – 2011

### Openfest 2010, Openfest 2011 – Member of the organisational committee

Two open source festivals organized by the OSLab community @teipir

2009

### FreeFriday Meetups (OSLab community)

I was the main organizer of a series of presentations covering various subjects at the OSLab @teipir. I did presentations about emulation/virtualization, pcb construction & security (which included a hands-on buffer overflow attack against a known vulnerable target). Other students as well as university professors covered their own areas of expertise.

2009

### tsc8 (https://github.com/skmp/tsc8)

Tiny softcore cpu, with assembler and emulator and VGA/HDMI output. Developed and presented as an educational project during the VHDL course @teipir

## Education

2006 – 2014 (stalled)

### Tei Of Piraeus, Electronic Computing Systems

- Pending Dissertation “Customized OpenRISC SoC with virtualization extensions”, Spartan6/ATLYS Platform

- OSLab administrator during 2009-2011

Certificate in Advanced English (CAE)