Kip Warner

Senior Software Engineer / Co-chairman OPMLWG

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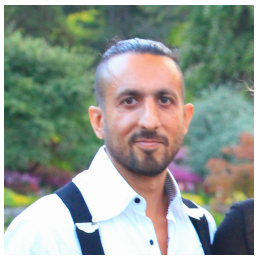

Education

2007 Artificial Intelligence, BSc (Cognitive Systems: Computational Intelligence & Design)
Department of Computer Science, University of British Columbia

2005 Associate of General Science
Kwantlen Polytechnic University

Professional Experience

Jul 2015 - Present **Cartesian Theatre Corp.**, Vancouver, British Columbia
Senior Software Engineer

Techniques: Artificial intelligence, asymmetric cryptography, build automation, continuous integration testing, digital signal processing, k-ANN, machine learning, MapReduce, REST architecture, SIMD, and UNIX server daemon.

Technologies: AddressSanitizer / MemorySanitizer; AltiVec / POWER Vector Media Extension; Apport; Assembly; AVX, Autopkgtest; Avahi / Apple's Bonjour; Bash; Boost; C++17; ConTEXt; CppUnit; cwrap (nss_wrapper); DBus; debhelper; Dogtail; Flask; GCC; GDB; Git; GNU Autotools; GNU/Linux; GNU gold; init.d; LaTeX; libav / FFmpeg; lsbinit; M4; Nginx; OpenBMC; OpenSSL; Pistache; pkg-config; PortAudio; PostgreSQL; PPA; Python; QEMU; quilt; sbuild / pbuilder; reprepro, setuptools; SQLite; STL; strace; systemd; Swagger; Umbrello; Valgrind, and zlib.

Standards: Debian Configuration Management Specification; Debian Database Application Policy; Debian Policy Manual; Debian Python Policy; DEP-8; Filesystem Hierarchy Standard; freedesktop.org; GNU Coding Standards; IANA; IEEE 754; JSON; LSB; OpenAPI Specification; POSIX; RFC 4180; RSA; SQL; UART; UNIX System V; UML; UPnP; and Zeroconf.

Hardware: Ported to 64-bit PC (amd64); 64-bit ARM (arm64); EABI ARM (armel); 32-bit PC (i386); POWER8/9 (ppc64el); RISC-V (riscv64); and partial progress to IBM System z mainframe (s390x) architectures.

- Responsible for architectural design and implementation of advanced digital signal processing and machine learning algorithms for commercial music space;
- Patent and trademark protected with additional pending;
- OpenPOWER *certified*;
- Comprehensive exploration of relevant scientific and engineering peer reviewed primary literature;
- Approved for Scientific Research and Experimental Development (SR&ED) credit;
- Co-maintainer of upstream *Pistache* dependency, a high performance modern C++ REST toolkit.

Mar 2020 - Present **OpenPOWER Foundation**
Co-chairman, *AI Special Interest Group (OPAISIG)*

- Formerly Machine Learning Work Group, assist in defining frameworks for productive development and deployment of AI solutions using OpenPOWER technology;
- Contribute to drafting and review of charter and various industry technical standards as voting member;
- Liaise with other industry stakeholders from Google, IBM, and others to promote POWER based solutions to everyday problems.

Dec 2016 - Mar 2017 **Cartesian Theatre**, Vancouver, British Columbia
Senior Software Engineer

Techniques: Artificial intelligence, complex systems theory, LALR(1) and Backus-Naur grammars, compiler design, graph theory, parallelization, cellular automaton, and build automation.

Technologies: C++14, STL; Gtkmm; GNU Flex and Bison; libsigc++; pthreads; Umbrello; GNU/Linux; GNU Autotools; M4; OpenSSL; Bash; Git; GCC; GDB; unit testing; pkg-config; debhelper; quilt; sbuild; OpenCL; Valgrind; and PPA.

Standards: ISO/IEC 14977; Debian Policy Manual; File Hierarchy Standard; freedesktop.org; GNU Coding Standards; POSIX; and UML.

- Sophisticated scalable high performance agent based social simulation engine;
- Responsible for architectural design and implementation;
- Simulates artificial life in big cities;
- Graphical node based model design tool;
- Hardware accelerated parallelization across heterogeneous computing units;
- Successfully assessed for Scientific Research and Experimental Development (SR&ED) credit;
- Developed with the generous assistance of the National Research Council of Canada's competitive Industrial Research Assistant Program.

Nov 2014 - Mar 2015 **Digital Theatre Systems**, Huntington Beach, California
Senior Software Engineer (Subcontractor)

Technologies: Finite state machines, regular expressions, and formal language parsers; C++; ALSA; GNU/Linux; Ubuntu; RS-232; HDMI, High Definition Audio (HDA), DTS Ultra High Definition (*DTS-UHD*), Groff, GNU Autotools; M4; Bash; Git; libav; GCC; GDB; unit testing; CMake; pkg-config; A/V receivers; debhelper; pbuilder; automation; and PPA.

Standards: Debian Policy Manual; GNU Coding Standards; EIA/CEA-861; File Hierarchy Standard; freedesktop.org; IEC 60958 / SPDIF; POSIX, and VESA Enhanced EDID Standard.

- Strong customer facing skills;
- Designed and engineered contributions to support next generation ultra–high definition surround sound technology;
- Showcased at 2015 Consumer Electronics Show, Las Vegas;
- Clients distributed in United States, Singapore, Japan and India.

Kip is very responsive and a total professional in answering queries about the software he has provided. The software itself is a breeze to use.

(Digital Theatre Systems)

Apr 2014 - Jun 2014 **Canonical Ltd**, London, United Kingdom
Software Sustaining Engineer

Technologies: C++; GNU/Linux; Ubuntu; GNU Autotools; Bash; Git; GCC; GDB; debhelper; pbuilder; and PPA.

Standards: freedesktop.org; GNU Coding Standards; POSIX, and Debian Policy Manual.

- Sole desktop developer within Canonical Technical Services Engineering;
- Clients included Google; Walt Disney; Amazon; French Gendarmerie; Danish Ministry of Defence, and other NATO allies;
- Contributed to Mozilla Thunderbird code base;
- Left on military leave.

Jul 2009 - Jan 2014 **Cartesian Theatre**, Vancouver, British Columbia
Senior Software Engineer

Technologies: Artificial intelligence; C++; GNU/Linux; GNU Autotools; DBus; GLib; Gtk+ 3; Glade; GObject introspection; Python; Bash; GCC; GNU Make; Bzr; GStreamer; Blender; GNU Ocrad; Audacity; Scribus; GIMP; Groff, ConTEXt; BibTEX; MySQL; and Inkscape.

Standards: freedesktop.org, POSIX and GNU Coding Standards.

- Successfully recovered substantial portions of NASA's historic billion-dollar 1975 Viking program's SDDPT original mission data. First ever exploration of Martian surface;
- Engineered digital forensic archaeology technology and algorithms cited by *NASA*;
- Responsible for architectural design and implementation;
- Scalability with high volume telemetry;
- Jewel case box art; trap-sheet; disc face art; website with MySQL, JavaScript, CSS3, PHP, and HTML5;
- Layman accessible with point and click Gtk+ DVD user interface;
- Authored accompanying 360+ page full colour richly typeset e-book;
- See *media* coverage for more information.

This is a clever hack.

(Richard Stallman, President FSF, MacArthur Fellow).

Apr 2009 - Jun 2009 **Art Institute of Vancouver**, Burnaby, Canada
Instructor

- Provided college level instruction at an academic institution to students for first year introductory C++ programming (VG1112);
- Created syllabus, assignments, exams, and provided mentorship;
- Established learning objectives, facilitated classroom discussions, and undertook faculty professional development training;
- Emphasis on ANSI / ISO standardization, GNU Coding Standards, and portability;
- Synthesized technical topics with social and ethical dimension of software *libre* through exploration of the literature.

He has very high standards and expects the most of his students. He is a natural instructor and has a gift at explaining complex subject matters simply.

(Dean's Faculty Observation Summary)

Feb 2009 - Jun 2009 **Manufacturing Automation Laboratories**, Vancouver, Canada
Software Project Engineer (Remote)

Technologies: C; C++; GCC; GDB; GEdit; gprof; NASM; Python; SCons; STL; Ubuntu; Intel 80x87, 80x86, SIMD (MMX, MMX2, SSE, SSE2), and Valgrind.

Standards: POSIX; GNU Coding Standards; and IEEE 754.

- Advanced manufacturing software technology commercially deployed internationally;
- Algorithm optimization and refactoring of core subsystems in computationally intense Virtual Machining System (Computer Numerical Controller emulator);
- Hardware–acceleration interfacing high level C++ OOP with 32–bit protected mode assembly;
- Improved build environment with standards compliance.

Sep 2008 - Dec 2008 **Rocket Gaming Systems**, Vancouver, Canada
Software Engineer

Technologies: C; C++; STL; Intel Vtune; IBM Rational Purify; Ant; GEdit; NSIS; SCons; SVN; Ubuntu; and VMWare.

- Conducted audits of flag ship product to examine licensing, memory leaks, architectural design issues, and optimizations;
- Drafted comprehensive technical reports identifying major issues with recommendations to senior management.

Jun 2008 - Aug 2008 **Scrapboy Digital Media**, Burnaby, Canada
Software Engineer

Technologies: C++; Ubuntu; STL; cppunit; XML, and Boost.

- Details under NDA prior to company's dissolution.

Dec 2006 - Apr 2008 **Small Neural Systems Group**, UBC Brain Research Centre, Canada
Software Engineer

Technologies: USB; V4L; Ubuntu; Quicktime; SCons; C++; OpenCV; Apt; wxWidgets; and OS X.

- Invented new algorithm to track sinusoidal movement of *C. elegan* nematode worms with machine vision for use in laboratory environment;
- Admitted into UNESCO's endorsed Free Software Directory.

Dec 2004 - Jan 2006 **Aviation Research Corp**, Point Roberts, Washington
Junior Software Engineer

Technologies: OpenGL and BSD sockets.

- Sophisticated airport traffic flow simulation modelling technology used across the globe by major international airports;
- Engineered high–performance digital camera API and drivers to expand hardware compatibility and increase product marketability;

- Oversaw field operations abroad in Shanghai, China;
- Deliverables completed effectively, on time, and under budget.

Professional Technical Skills

- Distributed computing, Bloom filters, vector clocks, elliptic curve cryptography, distributed ledgers, blockchain, and SWIFT.
- Strong customer facing, written, and oral communication skills.
- Attention to detail.
- Build automation engineering.
- GNU Coding Standards.
- GNU Autotools, GCC, GDB, diff, patch, and Nemiver.
- Node.js / libuv C++ Addons.
- Data structures and algorithms.
- Languages: C; C++, STL; Bash; Python; Assembly; Lua; PyGI, GObject introspection; and relational databases.
- UML & Design Patterns.
- Portability.
- Multimedia: GStreamer, OpenCV, OpenGL, SDL.
- Networking & Security: Berkley sockets, Winsock, GnuTLS, OpenPGP.
- Document Engineering / Typesetting: Groff, ConTEXt, BibTEX, and Scribus.
- SCM: Bzr, CVS, Git, Mercurial, and SVN.
- GUI: Gtk+, Glade, wxWidgets, Qt, PyGI, and Windows API.
- Reverse engineering.
- Project costing and feasibility assessments.

Software *Libre* Community Projects & Contributions

DXX-Rebirth

- Source port contributions of original Descent game with improved networking, data structures, and bug fixes.

Agni

- Interpreted programming language with C–like syntax.
- Consists of assembler, compiler, and virtual machine.
- Cross platform and multi–threaded.

EasyTAG

- Improved media parser base64 decoding for album art for large files from seven minute $\theta(n^3)$ to less than a second $\theta(n)$ running time.

Other Contributions

Autoconf; bisonc++; file, flexc++; GCC; Gnome-Applets; GNU Multiple Precision Floating-Point Reliably; Insight; libav; libcairo; Nicotine+; Pidgin; Pistache; Seahorse;

STandalone REproducible FLOating-Point; Subversion; Umbrello; Winamp; and software for the visually impaired.

Professional Affiliations, Service, and Awards

- OpenPOWER Foundation Machine Learning Workgroup – Voting Member.
- Free Software Foundation – Associate Member.
- Seaforth Highlanders of Canada Regimental Association.
- $500 Bursary Award – Seaforth Highlanders of Canada Regimental Association.
- Tournament of Minds for Maths & Engineering, Special Award for Efficiency and Simplicity of Device.

Qualifications

- AI Ethics 1 - Governance, Alberta Machine Intelligence Institute (*verify*);
- Machine Learning, Stanford Online Coursera (*verify*);
- USPTO Basic Patent Training;
- IBM Business Partner Integrity;
- IBM Blockchain Essentials for Developers Certification;
- Combat First Aid, First Aid Standard Enhanced, and First Aid Level C CPR Rescuer;
- Student Pilot Permit;
- Aviation Medical Category I;
- Aeronautical Radiotelephone Restricted Operators Certificate;
- H2S Alive© Certificate;
- Workers Hazardous Materials Information System;
- FOODSAFE Level 1.

Civic & Volunteer Work

- Kitsilano Neighbourhood House – Community Volunteer Income Tax Program (2018-2019) and Better at Home program (2018, 2020);
- Elections BC 2020 Advanced Information Officer & Counting Support;
- Elections BC 2017 Supervisory Voting Officer – Managed electoral staff of 16;
- Elections Canada Scrutineer 2015 – Observe integrity of electoral process;
- VegFest 2011–2015 – Block Captain, Security Officer, and General Labour;
- CanSecWest 2009 – Volunteer;
- UBC Shad Valley Summer 2007 – Guest Lecturer;
- 8th–24th *Annual Labour Christmas Dinner* for the underprivileged.

Profession of Arms

Royal Canadian Infantry Corps (Combat Arms)

Feb 2011 - Feb 2015 **Seaforth Highlanders of Canada, Canadian Armed Forces**
Infantry Officer, Second Lieutenant

- Primary Reserve line infantry regiment under 39 Canadian Brigade Group, 3 Canadian Division, Land Force Western Area.
- Preserved regimental history; maintained, and upheld good stewardship of public resources; and improved junior officer professional development.
- Direct Entry Officer (MOS 180) with Reliability Status Security Clearance with Honourable Release.

You are demonstrating the qualities of integrity, loyalty, courage, honesty, fairness and responsibility putting service to humanity before self–interest.

(Rt Hon Paul Hellyer, former Deputy Prime Minister of Canada and friend).

Relevant Courses, Training & Professional Development

Basic Military Qualification (PRes BMQ–Common)

- Instructed by British Columbia Regiment (Duke of Connaught's Own) armoured reconnaissance unit.
- Graduated with 96 % average, highest in platoon, with perfect service rifle range score.

Second Lieutenant Warner's ability to adapt to changing situations and apply logical thought to problems enabled him to meet the course standard.

(Course Officer).

Basic Military Officer Qualification Part II (AIOV)

- Instructed by Royal Westminster Regiment infantry unit in principles of leadership; battle procedure; day and night navigation; mission estimates; field craft; principles of war; issuing orders; leading subordinates; team work; and mission planning.

I noted in his Course Report upon his successful completion that he demonstrated the professional qualities and attributes befitting of an officer in the Canadian Armed Forces. He did perform in an ethical manner. He demonstrated a regard for the safety of others and an ability to work with them. He also demonstrated the ability to work under pressure.

(Course Officer).

CF Leadership and Recruit School Courses, Officer Professional Military Education

- Law and Military Justice
- Leadership and Ethics
- Staff Duties

NATO SCHOOL Oberammergau ADL Courses, Allied Command Transformation

- Crowd and Riot Control
- Gender Perspective
- Human Trafficking: Causes, Consequences, Counter-Strategies
- Improvised Explosive Device Awareness Course
- Introduction to Hague and Geneva Law
- Introduction to Satellite Operations (NATO School:N3–01)
- Multinational Crisis Management
- NATO Intel
- NATO Rules of Engagement

Other Relevant Courses and Training

- Assistance to Law Enforcement & Aid to Civil Power
- Conflict Management with Negotiation – Inter-American Defense College
- Controlled Goods General Awareness Training (301328)
- DND/CF Information Management
- Green Procurement (C215) – Canada School of Public Service
- Introduction to Risk Management
- Light Urban Search & Rescue – BC Housing
- Modelling and Simulation COE
- Survival Skills in the Mountains – Slovenian Armed Forces
- Law of Armed Conflict – Turkish Partnership for Peace Training Center
- Cyber Defence Awareness – NATO Cooperative Cyber Defence Centre of Excellence
- Public Key Infrastructure – NATO Communications and Information Systems School
- Cyber Hygiene – NATO HQ
- Mine Awareness – NATO JADL
- Preserving a Crime Scene – NATO JADL
- Digital Forensics and Digital Evidence – NATO JADL

Hobbies

- Civil and administrative law, analytic and literary philosophy, economics, geopolitics, history, science, theology, mathematics, and other subjects;
- Body building, kombucha, yoga, health, and nutrition;
- Classical French school of fencing in foil, épée, and sabre (past);
- Vipassanā meditation.

Selected Publications

- *Pinch-Shift: a novel machine vision algorithm for detecting termini in worms*, publication pending – Coauthor;
- *Avaneya Project Crew Handbook*, Cartesian Theatre, 2015 – Author;
- *C for Dummies*, 2nd Ed, 2004 – Technical Editor.

Psycho–Educational

WAIS-III

- Assessment Date: 2 Sept 2005.
- Examiner: Gail Ross, BSc, MEd Psych.

Picture Completion	13	Vocabulary	15
Coding	11	Similarities	19
Block Design	14	Arithmetic	13
Matrix Reasoning	16	Digit Span	11
Picture Arrangement	13	Information	15
		Comprehension	15

	Composite Score	*Percentile Rank*	*90% Confidence Interval*	*Qualitative Description*
Verbal Scale	131	98	126-134	Superior
Performance Scale	124	95	117-128	Superior
Full Scale	131	98	127-134	Superior
Verbal Comprehension	138	99	132-141	Superior
Perceptual Organization	128	97	120-132	Superior