Raymond Lambert -- Senior/Principal Software Engineer

530 Grove Street, Framingham, MA 01701

774-279-2999

raylambert@interthingy.net

http://interthingy.net/ray/resume/

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Skills Summary

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 Languages \* C++ \* C \* Python \* Bash \* HTML \* CSS \* PHP \* JavaScript

 \* jQuery \* Java \* SQL \* assembler \* many others...

 Systems & \* Linux \* Unix \* POSIX \* Apache \* Tomcat \* Git \* Mercurial

 Tools \* wxWidgets \* Qt \* GTK+ \* Windows \* Cygwin \* Embedded Systems

 \* many others...

 Technical \* Open Source tools and development methodologies \* GUI design

 Skills and development \* Object-oriented design \* Strong technical

 documentation skills \* SCM \* Build automation \* Tool-smithing

 Personal \* Excellent written and interpersonal communications \* Rapidly

 Skills assimilates new technologies and environments \* Works well in

 groups or individually \* Well organized and self-motivated

 \* Creative problem solver

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Professional

Experience

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 Aug 2002 -- Volpe National Transportation Systems Center (USDOT) --

 present Cambridge, MA

 https://www.volpe.dot.gov

 Job Title Information Systems Specialist

 Roles Principal Software Engineer; Lead Developer; System Architect

 Technologies \* C/C++ \* Python \* Bash \* Git \* Ruby \* Perl \* Java \* Tomcat

 Used \* HTML/CSS/JavaScript/jQuery \* PHP \* Linux/Solaris/AIX \* Oracle

 \* MySQL \* Windows \* TCP/IP networking

 Details Developed new and maintained existing software for various

 Federal Aviation Administration (FAA) programs:

 \* From January 2013 to the present, served as a member of the

 ADS-B (Automatic Dependent Surveillance-Broadcast) SAPT

 (Service Availability Prediction Tool) team that is developing

 and maintaining two web sites that provide official FAA

 information services to pilots and airlines about the

 availability of GPS-based navigation capabilities along

 aircraft routes-of-flight. The web sites use HTML, CSS,

 JavaScript, jQuery and PHP on the front-end and Java on the

 back-end, including Tomcat-based Java Web Services and

 standalone back-end servers written in Java, and an Oracle

 database:

 \* https://sapt.faa.gov/ -- Predicts the availability of GPS

 service and the performance of ADS-B-based navigation for

 aircraft along their routes-of-flight. The web site

 offers both an interactive HTML-based web form as well as

 an XML-based web service designed for automated use by

 flight planning systems. New FAA rules (which are

 currently out for public review and planned to go into

 effect in 2020) will require all flights that do not meet

 minimum hardware standards to use this web site pre-flight

 to determine whether they will meet the required

 navigational performance.

 \* http://www.raimprediction.net/ -- Predicts the

 availability of GPS RAIM (Receiver Autonomous Integrity

 Monitoring) for aircraft using certain classes of

 navigation hardware. Proper use of this tool satisfies an

 FAA requirement for these aircraft when operating on

 certain designated routes and is explicitly recommended by

 the FAA for this purpose. The web site offers both an

 interactive HTML-based web form as well as an XML-based

 web service designed for automated use by flight planning

 systems.

 The RAIM Prediction web site was previously developed by

 another team and its maintenance and further development

 was turned over to the SAPT team in early 2013.

 In 2015, raimprediction.net was discontinued and its

 functionality was integrated into sapt.faa.gov.

 \* From November 2012 to January 2013, developed a data

 collection server to capture data from weather instruments via

 a 32-port serial card, a counter card and a frame-grabber

 device. The software was developed in C++ in a Linux

 environment and deployed on a Windows 7 system under Cygwin.

 The software is part of an experimental weather monitoring

 program for aviation at Otis Air Force Base and serves as the

 back-end for an experimental web site that provides a

 dashboard view of the data.

 \* From March 2009 to November 2012, served as Lead Developer and

 System Architect on a project to develop a Monte Carlo-style,

 fast-time aircraft/vehicle simulation tool. Developed the

 software architecture and led several developers in

 implementing the software suite (C++ and Python).

 The tool had a focus on ground-based operations (with some

 airborne operations) and was designed specifically to analyze

 a new concept for reducing taxi delays on the airfield called

 Collaborative Departure Queue Management (CDQM). The basis of

 CDQM is to predict taxiway congestion and to mitigate it by

 holding some aircraft in the gates for some period of time

 (which also reduces the amount of fuel wasted while idling on

 a taxiway).

 The simulator generated synthetic tracks (aircraft), based on

 a defined scenario, that could autonomously navigate the

 airport surface and negotiate traffic situations. It was able

 to integrate with the CDQM server while simultaneously acting

 as a surveillance data source (i.e. track data) and a consumer

 of CDQM advisory data, which it used to control the release of

 departure aircraft from gates. Performance analysis of CDQM

 was conducted by statistically comparing the airfield

 performance for the given simulation scenario both with and

 without input from CDQM.

 \* From September 2006 to March 2009, served as Lead Developer

 and System Architect on a project to develop a Monte

 Carlo-style, fast-time aircraft simulation tool focused

 primarily on airborne flight in and around airport terminal

 areas. Developed the software architecture and led several

 developers in implementing the software suite (primarily in

 C++).

 The tool was intended to replace a sponsor's existing tool and

 therefore was required to duplicate certain functionality as

 well as implementing new functionality. The tool is used by

 the FAA sponsor to study proposed changes at the Nation's

 airports and to make formal determinations regarding the

 safety of the changes as well as formal recommendations for or

 against the changes. The types of changes that are studied

 include physical changes (e.g. new runways), configuration

 changes (e.g. traffic patterns and uses of runways and

 taxiways) as well as proposed rule changes related to airport

 operations. All such studies are focused on safety and, in

 particular, on the mitigation of unexpected circumstances such

 as unplanned aircraft movements.

 \* Prior to September 2006 served as Principal Software Engineer

 on several smaller projects:

 \* Maintained a prototype airport surface surveillance system

 for the FAAs SafeFlight21 program. The system fused data

 from multiple sources (including ASDE-X multilateration,

 secondary radar, flight plan database, and aircraft

 transponders) to generate a live, real-time "picture" of

 the local air traffic situation showing all aircraft and

 their position, identifying information, track/heading and

 velocity.

 \* Developed and maintained a TCP/IP-based data distribution

 server application with content-based filtering.

 \* Developed software to control an ADS-B radio receiver,

 decode data, and serve to clients.

 \* Developed data analysis software for the FAAs Runway

 Status Lights program, to aid a study tasked with

 determining where and how many new runway status lights

 should be installed at several dozen of the nation's top

 airports. Also developed functional verification software

 to verify the correct operation of the Runway Status

 Lights system.

 \* Maintained and administered multiple distributed TCP/IP

 networks (including Ethernet-based LANs and T1 circuits)

 and network equipment (Cisco routers and managed switches)

 linking remote sites to supply realtime airport

 surveillance data to clients.

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 Jan 1997 -- Foliage Software Systems, Inc. -- Burlington, MA

 Oct 2001

 http://www.foliage.com

 Job Title Senior Software Engineer

 Technologies \* C/C++ \* STL \* UML \* XML \* HTML \* ASP \* JavaScript \* CORBA

 Used \* Windows/MFC/COM \* Solaris \* Motif \* VxWorks \* MercuryOS \* TI

 C3x/C4x DSP \* MS SourceSafe \* RCS \* IMAKE

 Details Participated in multiple client projects encompassing extensive

 software design and development work on a broad array of

 technologies and products, both individually and as a team

 member, with a strong emphasis on object-oriented methodologies.

 Summary of projects worked on:

 \* Enhanced the control software for a commercial ion

 implantation system. Enhancements ranged from improvements to

 the advanced robotic wafer handling system which significantly

 reduced accidental wafer breakage (potentially saving

 end-users thousands of dollars per incident) to user interface

 extensions that enabled secure remote access to recipe editing

 facilities (and others), allowing end-users to optimize their

 access to system resources. Developed software in C for a

 VxWorks and SunOS/Motif environment.

 \* Participated in a proof-of-concept project to design and

 develop enhancements to a set of deployed commercial electron

 beam lithography systems. Used an object-oriented design

 process and developed software using C++ and COM to

 simultaneously run on Windows NT, Solaris, and a bank of

 parallel processors running MercuryOS.

 \* Designed and developed an object-oriented, distributed control

 system framework for a commercial electron beam lithography

 system. The system manufacturer used the framework to develop

 their next-generation lithography system in C++, saving them a

 great deal of development time and enabling them to rescue a

 badly slipped development schedule to deliver their new

 product on time and on budget. Used an object-oriented design

 process, including UML modeling, and implemented the design in

 C++ using STL and CORBA. Developed a multi-platform build

 tool using IMAKE that supported Solaris, Windows NT, and

 VxWorks.

 \* Designed and developed embedded avionics software, including a

 primary flight display and a navigation display, for a small

 aircraft. Software was developed to DO-178B Level B

 guidelines and received FAA certification. Utilized an

 object-oriented design process, including extensive UML

 modeling. Designed and developed an OO framework in a C

 environment which provided C++-like functionality, including

 inheritance and true polymorphism, and allowed the team to

 quickly translate the OO design into C code for a timely

 delivery to the client. Applications ran in a custom embedded

 environment on a TI C3x / C4x DSP, cross-compiled and emulated

 from Windows NT.

 \* Designed and developed medical software for a blood testing

 application. The software was considered a ``process

 control'' application because it only partially controlled the

 hardware environment while primarily intending to

 interactively guide a human operator through all the steps of

 the testing process, as well as computing and storing the

 final results. Developed a custom GUI using Visual C++ and

 MFC to run in a Windows 2000 environment. Also developed

 several major system components.

 \* Enhanced the control software for an advanced digital jukebox.

 Developed software in C++ and JavaScript/ASP/DHTML, for a

 Windows 2000 and COM+ environment, using ATL, STL, and MFC.

 Designed and developed an event logging system which was

 implemented as a COM component, wrote log files in XML format

 to enhance machine readability, and accepted queries from

 Active Server Pages (ASP) to which it responded with

 XML-formatted event data. Designed and developed a simulator

 for a custom HTTP server which acted as the interface to a

 remote, proprietary song database used to automatically

 populate jukeboxes in the field (restaurants, bars, etc.).

 Enhanced the XML processing components of the jukebox

 configuration management sub-system to use multiple, overlaid

 XML files that allowed new factory configuration data to be

 introduced into an end-user installation while preserving

 site-specific settings when possible. Made enhancements to the

 web browser-based GUI.

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 Oct 1994 -- National Datacomputer, Inc. -- Billerica, MA

 Dec 1996

 Job Title Senior Software Engineer

 Technologies \* C/C++ \* 80x86 assembler \* MS-DOS \* DPMI \* Windows \* Novell

 Used NetWare \* RCS

 Details Developed new and maintained existing software in C and

 assembler for a PC-based, hand-held computer, with a

 concentration on user interface facilities. Designed and

 developed an advanced full-screen editor for proprietary

 database files, written in C++ for an MS-DOS/DPMI environment,

 which enabled customer support personnel to work more

 efficiently and reliably. Designed and maintained adaptable

 software build procedures for an MS-DOS environment.

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 Jul 1992 -- Practice Management Systems, Inc. -- Needham, MA

 Oct 1994

 Job Title Software Engineer

 Technologies \* BASIC \* C/C++ \* 80x86 assembler \* MS-DOS \* Novell NetWare

 Used

 Details Developed new and maintained existing software for electronic

 medical insurance claim submission and medical billing. Wrote

 MS-DOS programs using MS-BASIC PDS and Borland C/C++, including

 network support for Novell networks using Novell NetWare API.

 Developed user interfaces, function libraries, and toolbox

 interfaces. Developed telecommunication software for claims

 submissions over proprietary networks using Borland C/C++ and

 Greenleaf communications library, and telecommunication scripts

 using ProComm Plus and other communications software packages.

 Wrote numerous tools and utilities including a note-taker

 application, used by telephone operators, that is capable of

 routing messages over a Novell Network to any printer, allowing

 customer service calls to be handled more efficiently.

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 Mar 1992 -- Interactive MicroSystems, Inc. -- Salem, NH

 May 1992

 Job Title Programmer/Consultant (short-term contract)

 Technologies \* C \* 68000 assembler \* Commodore Amiga

 Used

 Details Developed new and enhanced existing video editing and controller

 software to control video editing decks and process

 ``edit-decision lists''. Developed a software library to load

 and display computer animations and still pictures transparently

 from multiple graphics storage formats. Integrated software

 with an external, commercial scripting language (Arexx).

 Software was written using C and 68000 assembler for the

 Commodore Amiga.

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 Jun 1989 -- Theta Systems, Inc. -- Woburn, MA

 Mar 1992

 Job Title Software Engineer

 Technologies \* C \* 68000 assembler \* Commodore Amiga \* CDTV \* VAX/VMS \* VAX

 Used MACRO

 Details Participated in multiple projects:

 \* Designed and developed CD-ROM-based, interactive multimedia

 software in C and 68000 assembler for the Commodore Amiga and

 Commodore CDTV, including the CDTV Welcome Disk, a product

 which was distributed worldwide with the CDTV player. Assumed

 responsibility for the Welcome Disc project under crisis

 circumstances: numerous outstanding changes and a very limited

 time budget. Converted the application into a script-based

 multimedia engine which allowed all changes to be completed

 before an important deadline. This also made the software

 usable for several other applications, saving the client a

 great deal of additional development effort.

 \* Co-authored the official developer's guidelines for CDTV,

 defining the proper behavior of CDTV applications and the

 standard user interface look and feel for the CDTV development

 community, accompanied by example programs and code libraries

 to demonstrate the principals described within.

 \* Designed and developed telecommunications software using C for

 the Commodore Amiga and VAX/VMS.

 \* Designed and developed IPC software for VAX/VMS in C and VAX

 MACRO.

 \* Designed and developed object-oriented drawing software using

 C for the Commodore Amiga.

 \* Researched and developed OOP methodologies as well as software

 coding techniques to make programs easily portable between

 different operating environments such as VMS, Amiga, and

 MS-DOS.

 \* Received some exposure to Macintosh and UNIX.

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 Oct 1988 -- Viking Technologies, Inc. -- Middletown, RI

 May 1989

 Job Title Managing Editor/Programmer

 Technologies \* C \* BASIC \* 6502 assembler \* Commodore 64/128/Amiga \* MS-DOS

 Used

 Details Produced the Commodore 64/128 edition of UpTime

 [https://en.wikipedia.org/wiki/UpTime\_(disk\_magazine)] a

 monthly, computer-oriented, diskette-based periodical.

 Responsibilities included: planning future issues; making

 editorial assignments; writing and editing articles and

 programs; working with an artist to procure artwork for

 publication; assembling the final product; managing a network of

 beta testers; and maintaining a monthly budget for all

 activities. Assisted in the startup of an Amiga edition and

 programmed for the Amiga and the IBM-PC editions. Developed

 hypertext authoring and presentation software on the IBM-PC.

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 Jan 1987 -- Applied Innovations, Inc. -- Wakefield, RI

 Nov 1989

 Job Title Software Engineer (part time from Oct 1988 through Nov 1989)

 Technologies \* BASIC \* C \* Turbo Pascal \* MS-DOS \* PVCS

 Used

 Details Developed new and maintained existing MS-DOS software for

 psychological testing and medical billing using Turbo C, Turbo

 Pascal, 80x86 assembler, and QuickBASIC. Conceived, proposed,

 designed and developed a new system in Turbo Pascal to generate

 printed medical insurance claim forms utilizing a full-screen

 editor and separate printing software. This software

 drastically expedited support for new claim forms, generating

 notable customer satisfaction and significant new income for the

 company. Managed company-wide software version control using

 PVCS. Continued working part-time on a consulting basis for one

 year after departing the company in November 1988.

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Other

Experience

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 2003 -- Various Open Source Projects

 present

 Participated in and submitted code to several Open Source

 projects, including some initiated by myself.

 \* Personal Projects web page:

 http://www.interthingy.net/ray/projects/

 \* Stomper virtual pedalboard/live effects processor for guitar):

 https://sourceforge.net/projects/stomper/

 \* Argent (RSS feed agent):

 https://sourceforge.net/projects/argent/

 \* Rex (text processing utility):

 https://sourceforge.net/projects/rex-text-tool/

 \* Rockbox (alternate DAP firmware):

 http://www.rockbox.org/

 \* Boost.Build (software build system):

 http://www.boost.org/boost-build2/

 \* Code::Blocks (cross-platform C++ IDE):

 http://www.codeblocks.org/

 \* Codelite (cross-platform C++ IDE):

 http://codelite.org/

 \* Kismet Qt/E (Kismet front-end for the Sharp Zaurus PDA):

 https://sourceforge.net/projects/kismet-qte/

 \* Guarddog (Linux firewall configuration utility):

 http://www.simonzone.com/software/guarddog/

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 Mar 1984 -- M.E.M.O. Computer User's Group -- Fall River, MA

 Mar 1987

 Position Librarian (elected 3 terms)

 Technologies \* BASIC \* 6502 assembler \* Commodore 64

 Used

 Produced a monthly club diskette containing public domain

 programs for the Commodore 64 computer and presented it at

 public meetings. Organized and taught club-sponsored

 programming classes in BASIC and 6502 assembly language

 programming.

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Education

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 1981 -- 1982 Bristol Community College -- Fall River, MA

 Area of Study Associates Degree in Electrical Engineering (incomplete)

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 1980 -- 1981 Bishop Connolly High School -- Fall River, MA

 Area of Study Introduction to BASIC programming

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References

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 Available upon request.

Updated: 2018-11-20