Raymond Lambert -- Senior/Principal Software Engineer

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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