
EDWARD J. SEGALL, Ph.D.409 Anthwyn Rd.
Narberth, PA 19072esr13@edge-technical.comPhone: (610) 668-0292

SYNOPSIS

Systems Engineer, Software Architect/Engineer, Computational Scientist with a record of significant improvements to the **speed, reliability, functionality, usability and maintainability** of complex, highly concurrent, mission-critical systems and applications.

Independent consultant experienced in Wireless geolocation (4 patents), Mobile communications, Video surveillance, Global banking, Cable television, Video-On-Demand, Atmospheric modeling, Medical instrumentation, Rail enterprise resource management, Dynamic content personalization.

Demonstrated expertise in:

Performance optimization	Physical modeling and simulation	Agile processes
Cloud/cluster/distributed/parallel computing	Scientific computing	Phased development, integration, deployment
Transactional consistency	Multithreaded systems	Continuous integration
Fault-tolerant systems	Embedded systems	Rigorous testing

EDUCATION

Ph.D. Rutgers University, **Electrical and Computer Engineering**

Research area: Scalable communication, **fault-tolerant synchronization** and **programming language support** for **dynamic distributed** and **parallel** systems.

M.S. Rutgers University, **Computer Science**

B.S.E University of Pennsylvania, **Electrical Engineering**

PROFESSIONAL HISTORY**R&D Consultant**

Edge Technical Associates LLC, 1999-2000, 2002-present

Responsible for leading the operation of Edge's full-service software consultancy

--- *Projects for client CCAD (Combined Conditional Access and Development) LLC (2/2011 – 12/2012) ---*
(CCAD is a joint venture between [Motorola Mobility](#) and [Comcast](#))

Systems engineering, software development, deployment staging and support for multiple projects in CCAD's Configuration Management (CM) group:

Dependency management system for [Atlassian Bamboo](#) continuous integration system

- Manages inter-plan dependencies for hundreds of separate build plans, based on [POM](#) properties.
- Notifies staff via email if inconsistencies are found.
- Developed library of Bash functions now used by many build, release and utility scripts.

Auto-retry feature for transient [Bamboo](#) build failures

- Retries failed build plan if failure was due to a retrievable error.
- Notifies CM staff and authors of all changes committed since initial attempt.

Automated cloning of sets of related [Bamboo](#) build plans, invoked by [git](#) branch hook

- Identifies sets of related plans based on POM property names and values.

[Atlassian Jira](#) plugin ([Type-2](#) – [OSGI](#)) to manage storage of oversized attachments

- Supports upload, download, listing of issues, projects and attachments via [ReST](#) services.

Automated deletion of -SNAPSHOT artifacts from [Sonatype Nexus](#) repository

- Run by release builds to identify all artifacts deployed to a release repository, and then delete from the corresponding snapshot repository all matching -SNAPSHOT versions of those artifacts.
- Run by Bamboo (triggered by deleting a build plan, via a Groovy event handler) to identify all artifacts deployed by the latest build of that plan and then delete all versions of those artifacts in that repository whose version number is consistent with the build plan's git branch.

Other miscellaneous custom scripts

- Periodically find and report Bamboo plans that have no dependents and have not been used recently.
- List repository URLs and branches of all child plans, for use by release process to update POMs.
- Perform source builds of open-source dependencies, for archival retention.
- Periodically make PDF snapshots of critical configuration pages to speed recovery from a major system failure.

Various other tasks, including:

- Troubleshoot intermittent build failures due to network exceptions while accessing Nexus.
- Improved Bamboo remote agent monitor script: restarts hung agents faster & more reliably.
- Automated cleanup of hung multiprocess builds.
- Resolved corruption issue in [log4j](#) logs on several server applications.
- Added LDAP servlet to external FTP server to allow users to change own passwords.
- Evaluated, planned and staged upgrades to Bamboo, Jira, [Sonar](#), and Bamboo remote agents.
- Configured VM clones of Bamboo and Nexus servers for product upgrade evaluation and pre-production software testing.
- Investigated [Gitorious](#): Trial setup and configuration (https access) and [Gitolite](#); reported findings.
- Worked with Atlassian support to resolve multiple issues, including several that resulted in changes to Atlassian software and documentation.

Used *Bash*, *Java*, [Groovy](#), *awk*, *grep*, [cURL](#), [MySQL](#), [JSON](#), [Xml Starlet](#), [Sonatype Nexus](#), [Sonar](#), [Apache httpd](#), [log4j](#), [Tomcat](#), [Velocity template engine](#), [subversion](#), [git](#), [Gitorious](#), [SuSE Linux](#), [VMWare](#) in this work.

-----Projects for client [Sarnoff Corporation](#), now [SRI International](#) (2010) -----

NOVA project: Real-Time WAAS Video Tracking

Multi-object tracking performance evaluation

- Developed tool to generate track-oriented [ViPER \(Video Performance Evaluation Resource\)](#) XML from the tracklet-oriented XML output of *NOVA* (a proprietary **data-parallel, real-time**, wide-area, multiple-target video tracking system). This enabled use of [Maryland's ViPER-GT ground-truth authoring tool](#) and [NIST's F4DE](#) (Framework for Detection Evaluations). Developed methods and workflows for using these tools to evaluate *NOVA's* tracking performance. Documented these for technology transfer to other team members.
- Fixed bugs in *NOVA's* tracklet generation. As part of this work, found a track/frame alignment error and fixed it by revising inter-thread and inter-process communication (in [MPI](#)).

Field Exercise Support

- Proposed and demonstrated a novel method for **scene-based Non-Uniformity Correction** of extinction artifacts in a shutterless, segmented image sensor.
- Developed tool to select co-synchronous video frames from asynchronous segmented camera arrays. Used this tool to obtain **usable video streams from unusable samples**.
- Proposed & set up Linux-based [CIFS \(Samba\)](#) server to work around speed limitations of available Windows-based drivers for reading high-resolution video data from [ext3](#) RAID file systems. Used this server to make daily video drops from TNT10 field exercise available to team.

Other

- Ported tracker build environment to Windows XP x64; Wrote road marking guide; Worked on a variety of issues related to builds, concurrency, memory, and other factors.

Used *C++*, *STL*, *BOOST*, [MATLAB](#), [MSXML](#), [ViPER-GT](#), *awk*, *Ubuntu Linux*, *Windows XP x64*, [MPI](#) in this work.

----- Projects for client [TruePosition Inc.](#) (10/2004 - 12/2009) -----

U-TDOA Location Processing—Accuracy improvements

- Improved 95th percentile accuracy of TruePosition's core location technology by 10%.
- These improvements resulted in two patents. With Chief Scientist and Senior Scientist, received TP's **2008 Invention of the Year** award for this work (first non-employee to receive this award).

Coop Generation Algorithms (Selection of Demodulating and Cooperating Receivers)

- **Developed and verified** coop generation algorithms for [Distributed Antenna Systems \(DAS\)](#).
- **Invented, developed and verified** coop generation algorithms for [UMTS](#) and other air interfaces that use [selective combining](#). This work resulted in two patents.

- **Resolved** long-standing result inconsistencies among Solaris, Linux and Windows builds by revising core data structures. Developed tests that reproduced discrepancies and verified the fixes.

Real-time resource scheduling

- **Invented, developed and verified** a novel scheduling method for LMUs (Location Measurement Units) that improves accuracy and system availability under high demand.

U-TDOA Location Processing—Reference selection

- **Led resolution** of anomalous GSM reference selection metric values found in testing.

CGI+TA and E-CID location processing

- System engineering, software design and implementation for multiple features and updates.

Simulation/Modeling

- Improved Accuracy Prediction tool speed **by 50X** and **halved memory** footprint (made server farm obsolete). Improved robustness across multiple platforms. This tool has been used to successfully **engineer nationwide networks** and has brought in **new business** through proposal support.
- As part of this work:
 - Ported to C++ a Java implementation of a fast cell-based polygon containment (CBCA) algorithm.
 - Used encapsulation and inheritance to integrate this C++ implementation into a related tool.
 - Made numerous stability improvements, bug fixes and feature enhancements in both tools.
 - Designed and developed a domain-specific comparison tool for comparing related results, measuring their differences, and formatting the differences for visualization in MapInfo.
- Served as system engineer and subject matter expert/internal consultant for simulation tools. Developed baseline reference results, test configurations and pass criteria for regression testing. Worked with QA department to address all discrepancies over multiple major releases.

Configuration/build/release management

- Improved internal release process for library code that is incorporated into multiple system components and standalone tools.
- Managed and performed release builds of those tools and release labeling of library code in coordination with SMLC team, SCOUT team and Release Engineering.
- Managed branch/merge planning and implementation in coordination with CM lead; managed transition of simulation tools and libraries from **Base ClearCase** to **UCM** and back while multiple concurrent major releases and exploratory efforts were ongoing.

Standards

- Contributed to 3GPP UMTS standard **TS 25.111** “*Location Measurement Unit (LMU) performance specification; User Equipment (UE) positioning in UTRAN*” via RAN4 work items.

Used C, C++, STL, Java, Visual Studio 2005, gcc, Sun Workshop, Perl, RedHat Linux, MATLAB, MapInfo, ClearQuest, ClearCase, UCM in work for this client.

----- *Projects for other Edge Technical Associates clients (3/2002-4/2005)* -----

Scientific Computing Associates: Developed distribution-ready Microsoft Visual Studio .NET port of Unix TCP [Linda](#) parallel/distributed programming system (in C) from [Cygwin](#) (*GCC*) prototype.

SevenEcho LLC: Designed and developed core system architecture and initial implementation of Personal Media Director (PMD), a highly scalable system that includes a lightweight Flash client API, Java servlets and JSP and MySQL database, and Personal Narrative Toolkit (PNT), a lightweight version of the PMD suitable for individual developer use and installed using the Nullsoft scriptable installer system ([NSIS](#)). Attained [Microsoft ISV/Software Solutions Competency](#) for the PNT.

IntelliTrans LLC (originally [August Design, Inc.](#), now [Transcore](#)): Led multi-organization team converting [STARR](#) legacy railroad ERP system from iSeries RPG to workflow-centric, web-based (Java + JSP) interface. Led requirements elicitation; designed system architecture; designed interfaces to existing programs, database tables, EDI subsystems, and jobs; systematically improved application performance; acted as technical liaison to primary customer, original STARR developers, and host site’s developers. *Used Eclipse, IBM WebSphere, [WebFacing](#) tool and [DB2/400](#).*

Liberate Technologies: Redesigned and enhanced layout engine of set-top web browser (C/C++). Improved layout of images, tables, and text and brought into compliance with HTML 4.01 standards.

Other clients: “Smart building” energy technology development, including consultations, software/system architecture design, and evaluation of 3rd-party components.

----- Previous employment -----

Senior Software Engineer, Video-On-Demand (VOD) Server Products

Liberate Technologies, Inc. (originally MoreCom, Inc.) Horsham, PA 2000-2002

- Led integration of all 3rd-party VOD servers with Liberate's Connect Suite product line. Streamlined integration by wrapping in easily reusable APIs the Java library interface to the existing operations management system and the existing Perl installation/configuration library. Fixed several long-standing Perl regular expression bugs in installation/configuration utility routines.
- Developed multithreaded, TCP socket-based Java client for [nCUBE](#) asset metadata publisher protocol; developed Java library and API that flexibly maps XML asset metadata from nCUBE, [SeaChange](#), and other XML-based video metadata servers to VOD Gateway parameters.
- Led video clip server development for [Vidéotron](#) Health project (C++).
- Researched Java Virtual Machines for embedded systems and taught internal short course.
- Actively participated in [Interactive Services Architecture \(ISA\)](#) standards working group.
- Mentored junior members of engineering staff.

Senior Software Engineer, Greystone Group

Sanchez Computer Associates, Inc. (now FIS), Malvern, PA 1998-1999

Database internals development for proprietary GTM parallel database engine:

- Analyzed new replication and failover features for potential impact to system performance and **business continuity**, resulting in several design and implementation refinements.
- Designed and implemented ACID-safe, **hard real-time transaction timeouts** to enable controlled failover during long transactions. (*Used C, assembly language.*)
- Identified and eliminated concurrency hazards including race conditions, livelock, etc.
- Improved system performance, reliability and behavior during exceptional conditions.
- Designed and implemented crash/recovery tests, which led to understanding and resolving several long-standing bugs. This **significantly improved database recoverability** after failures.

Assistant Professor, Department of Computing Sciences and Consultant, NSF I/UCRC Center for Advanced Communication

Villanova University 1996-1998

- Taught undergraduate Algorithms and Data Structures courses in C and in Java.
- Revised and taught graduate Distributed Systems, Object-Oriented Design and Programming.
- Led class-wide Rapid Application Development projects.
- Closely supervised many M.S. independent projects.

Visiting Assistant Professor, Dept. of Computer and Information Science

University of Delaware 1995-1996

- Revised and taught graduate Discrete-Event Simulation and Programming Languages courses.
- Taught undergraduate Algorithms and Data Structures in C and in C++.

System Scientist

Carnegie Mellon University School of Computer Science 1992-1995

Research project: "*Distributed Computational System for Environmental Modeling*", an NSF High-Performance Computing and Communications (HPCC) initiative **Grand Challenge** project:

- [Parallelized](#) the [Urban-to-Regional Multiscale Airshed air quality model](#) . Used task and data parallelism, message passing ([PVM](#)), and network-optimized communication and I/O.
- Ported model to vector supercomputers, massively parallel processors, workstation clusters, and wide-area heterogeneous combinations of these systems at the [Pittsburgh Supercomputing Center](#).
- Designed **model verification methods** that led to quick identification and resolution of errors.
- Achieved highest regional air quality model performance ever reported as of that time.
- Supervised [porting the model](#) to the [Fx task-and-data-parallel FORTRAN language](#).
- Developed the Airshed component of the [CMU Task Parallel Program Suite](#).
- Supervised staff and undergraduate programmers and managed tight schedules.

PRIOR EXPERIENCE

Software, firmware, and analog & digital hardware design, including real-time signal processing, medical instrumentation, robotics, and real-time optical measurement systems.

PRESENTATIONS, PATENTS, AWARDS, PUBLICATIONS

Recent:

- Presentation: "Methods for determining the location of mobile devices in real time", to IEEE Philadelphia Consultants Network, December 4, 2012.
- [US Patent 8290496, "Cooperating Receiver Selection for UMTS Wireless Location", Edward Joseph Segall, Simon Issakov and Rashidus S. Mia.](#)
The first of two related patents on finding cooperating receivers for U-TDOA location of mobile devices that use CDMA or similar technologies that have a "soft handover" state. This patent covers "proxy" methods, in which one base station is selected as a proxy for the others, and cooperating receivers are based on the proxy antenna's location and RF properties.
- [USPTO Application No. 12/648,783, "Cooperating Receiver Selection for UMTS Wireless Location".](#)
Second of two related patents. It covers "aggregate" methods, in which the RF properties of all active set members' antennas are used to select cooperating receivers.
- [US Patent 7956808 B2, "Method for Position Estimation Using Generalized Error Distributions", Pete A. Boyer, Rashidus S. Mia, and Edward J. Segall](#)
This method improved the 95th percentile accuracy of TruePosition's location system while preserving its 67th percentile accuracy. It received TP's **2008 Invention of the Year Award**.
- [US Patent 8138976.](#) Continuation of 7956808 B2 that extends the claims to hybrid U-TDOA / GPS location methods.
- [TruePosition 3GPP RAN Working Group 4 contribution R4-070478, "Simulation Proposal for UTDOA LMU Performance",](#) Kobe Japan, May 2007, with Pete Boyer, Rashidus Mia, Ron Lefever.
- [TruePosition 3GPP RAN Working Group 4 contribution R4-070490, "Simulation Results for UTDOA LMU Performance",](#) Kobe Japan, May 2007, with Pete Boyer and Rashidus Mia.

Earlier:

Please see <http://www.edge-technical.com/esegall-publist.html>

SYSTEMS, LANGUAGES, TECHNOLOGIES

Programming Languages	Java / J2EE / J2ME, JSP, C, C++, STL, XML, Adobe Flash, Perl, Smalltalk, Eiffel, MATLAB, HTML, High-Performance FORTRAN (HPF, F90), Lisp, Pascal, Postscript, Prolog, RPG-IV, and others.
Scripting & related tools	Bash, sh, csh, Awk, Groovy, cURL, wget, Xml Starlet, others.
Data representation	xml, xpath, DOM, JSON, others.
Build	Bamboo continuous integration server, maven, make / Imake, others.
Assembly Languages	HP (DEC) Alpha, HP RISC, IBM RS6000/PowerPC, Sun SPARC, others.
Performance Tuning	Intel VTune Performance Analyzer and other tools
Web Application Platforms	Apache, Tomcat, WebSphere.
Database access/Databases	MySQL, JDBC, IBM DB2/400, FIS GTM (parallel SMP database), others.
IDEs and editors	Eclipse, MATLAB, Microsoft Visual C++, JBuilder, NetBeans, Flash MX, Smalltalk-80, X-Windows, emacs, vi, vim, etc.
OS + Platforms	SuSE Linux, RedHat Linux, MacOS, Solaris, Cygwin, MSYS/MinGW, IBM AIX, HP (Compaq/DEC) Tru64 UNIX, BSD. Also Microsoft Windows, SGI (Cray) T90/T3E supercomputers, Scientific Atlanta PowerTV.
Inter-process communication	TCP/IP socket-level programming, DCOM, CORBA, shared memory (various), message-passing (PVM/MPI), Linda, & others.
Source control	Git, SubVersion, ClearCase (Base and UCM), Perforce, CVS.
Visualization	MapInfo, MATLAB
Issue tracking	Jira, ClearQuest

Copyright 2002-2013 Edward J. Segall. All rights reserved. This document is expressly not in the public domain and remains the sole property of the copyright owner. Modification or abbreviation of this document without the knowledge, review, and express permission of the copyright owner is strictly prohibited.
