

Thomas Pelaia II, Ph.D.

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PROFILE

Accelerator physicist and experienced software architect specializing in developing enterprise software from the ground up, plus developing algorithms to solve complex problems. Has expert knowledge of Java, Objective-C and Swift programming languages. Proven track record for delivering full stack solutions including problem definition, modeling, algorithm development, problem solving, solution analysis, software delivery and support. Proficient in modern web, desktop and mobile application development, design patterns, software architecture and software quality control.

QUALIFICATION HIGHLIGHTS

Leadership and Management

- Manages and leads the Open XAL international collaboration
- Principal architect of high level applications frameworks for a \$1.5 billion facility
- Accelerator Physics Application Leader at the Spallation Neutron Source (SNS)
- Completed Management Bootcamp in April, 2014
- Pioneered mobile enterprise software development at Oak Ridge National Lab (ORNL)
- Team admin for the U.S. Department of Energy's Enterprise iOS Developer Program
- Chaired the software quality control board for SNS
- Initiated and managed the CA Pod project and CAML projects
- Modeling Manager at Quantum Leap Innovations
- Led High Tune experiments at the Cornell Electron-Positron Storage Ring (CESR)

Advanced Computer Skills

- Over 20 years experience in Software engineering with modern design patterns
 - ▶ Mac OS and UNIX Development: 20 years
 - ▶ Software Modeling and Architecture: 15 years
 - ▶ Java and Objective-C: 15 years
 - ▶ iOS: 7 years
- Analytical problem solving, Object Oriented Modeling, algorithm development, simulation and analysis for real world solutions
- Products: Desktop applications, Web applications, Distributed services
- Modern Platforms: Mac OS X, iOS (iPhone/iPad/iPod), Linux
- Languages: Swift, Objective-C, Java, Ruby, JavaScript, bash, C, C++, Python, AppleScript
- Full Stack Web: HTML 5, CSS, JavaScript, Ruby on Rails, WebObjects, DOM, XML, XSLT
- Frameworks: Cocoa Touch, Cocoa, Core Data, Scene Kit, Swing
- Development Tools: Xcode, Git, Ant, Make
- Database: SQL, JDBC, EOF, Oracle, MySQL
- Control System: EPICS Channel Access client

Scientific Skills

- Accelerator Physics with over 15 years experience: High Power Proton beam, Electron-Positron collider, nonlinear dynamics
- Mathematics: Classical and Modern applied math, Nonlinear Optimization, Field theory
- Data analysis (including statistical analysis) and presentation

WORK EXPERIENCE

January 2002 - Present

Spallation Neutron Source (SNS), Oak Ridge National Lab, UT-Battelle; Oak Ridge, TN
Accelerator Physics Applications Leader (August 2007 to Present)

- Senior R&D Staff and Accelerator Physicist
- Performs accelerator physics experiments and analysis
- Works closely with members of the Operations, Controls and Diagnostics groups
- Mentors HERE and SULI students and visitors, and participates in education outreach
- Leads the application programming effort for Accelerator Physics providing a vision for the software effort and managing software tasks for the team
 - ▶ Developed an algorithm and code implementation for efficient fitting of noisy damped sinusoid waveforms
 - ▶ Developed a math library for computing symbolic multivariate differentials
 - ▶ Ported much of the libdispatch library API to Java for powerful concurrency management
 - ▶ Developed an application for measuring the live tune of the machine's accumulator ring
 - ▶ Developed a service for logging machine trips
 - ▶ Developed an innovative and cost-saving accelerator physics method and supporting software to reconstruct a transverse beam distribution using beam position monitors
 - ▶ Developed a unique, modern MVC GUI builder for rapid development of Java Swing user interfaces
- Leads the Open XAL international collaboration
 - ▶ Set the project vision, lead meetings and manage milestones and tickets
 - ▶ Manages the project website and repositories
 - ▶ Serves as expert consultant for international collaborators
 - ▶ Architected the project layout and build system
 - ▶ Developed a JSON coder for coding and decoding Java objects
 - ▶ Developed a JSON-RPC processor for transparent remote procedure calls
 - ▶ Ported the bulk of XAL to Open XAL
- Chaired and active board member of the software quality control board for SNS
- Team admin for the U.S. Department of Energy's iOS Developer Program
- Leads mobile enterprise application effort at ORNL
 - ▶ Developed an award winning iPad based solution which replaces an expensive and complex third party solution
 - ▶ Provided mobile development consultation for the lab's IT department
 - ▶ Built an iPhone and iPad app for inventory management
 - ▶ Ported the EPICS client library to iOS, created an Objective-C wrapper
 - ▶ Developed the CA Pod probe app for iPhone and iPad
- Develops and maintains mission critical web applications
 - ▶ Upgraded the SNS operations logbook to support the neutrons directorate

- ▶ Developed a web application for configuration control of diagnostics systems
- ▶ Managed the Channel Access Markup Language (CAML) project which utilizes web browsers as a display manager for Channel Access controls

Application Programmer (January 2002 to August 2007)

- Architected a framework for rapid development of high level MVC applications
- Architected a services framework
- Architected, developed and maintains a pioneering database driven Electronic Logbook as a web application using WebObjects, HTML 5, CSS and JavaScript
- Produced software for machine commissioning, studies and operations
 - ▶ Developed a service for logging machine conditions periodically and on demand
 - ▶ Developed a service for discerning and publishing first fault trips in the accelerator
 - ▶ Developed an application to display and correct the beam orbit throughout the accelerator
 - ▶ Developed an Energy Manager application for optimizing the change to machine parameters
 - ▶ Developed a knobs application for controlling multiple machine parameters concurrently
 - ▶ Developed an intelligent optimization package
 - ▶ Developed a messaging package
 - ▶ Developed a correlator for correlating signals temporally in real time
 - ▶ Developed a virtual scope application
 - ▶ Developed a package for efficiently parsing and processing formulae
 - ▶ Architected and developed the tools for loading the accelerator from a series of XML files and managing machine modifications
- Developed the first 64 bit web browser for Mac OS X (making it possible to run 64 bit Java applets)
- Developed a Quartz composer plugin for generating an image from a web page
- Created the first WebKit plugin to transform a web browser into a powerful EPICS client
- Promoted to Application Programming Team Leader

September 1998 - December 2001

Quantum Leap Innovations; Newark, DE

Modeling Manager, Project Manager and Modeler

- Managed the modeling team through all phases of development of high value projects including problem definition, contract negotiation, requirements specification, project planning, resource management, coding, quality control and product delivery
 - ▶ Managed projects for a variety of private and military customers
 - ▶ Kept our clients happy by delivering solutions on time with clear, predetermined milestone deliverables and managing resources to meet challenges
- Applied for, won and managed a successful SBIR project
 - ▶ Developed a novel scheduling algorithm and architected the scheduling framework for an award winning project which solved a long standing satellite scheduling problem for U.S. Space and Missile Command
- Architected the client-server modeling framework using Objective-C
- Introduced web based solution delivery
- Led the effort to port the problem solving engine from C to an efficient object oriented Java framework

- Modeled the energy distribution problem for a major energy exchange and developed a solution to optimize power plant utilization
- Managed a project for multi-year planning of military spending given strategic goals and budget constraints
- Promoted from Modeler to Project Manager and then to Modeling Manager

January 1994 - August 1998

Laboratory of Nuclear Studies, Cornell University; Ithaca, NY

Programmer/Analyst

- Developed and maintained control system software for the CESR accelerator
- Co-designed, implemented and maintained the CESR electronic logbook
- Conducted nonlinear optics design and optimization
- Designed, proposed and executed accelerator experiments

June 1990 - December 1993

Laboratory of Nuclear Studies, Cornell University; Ithaca, NY

Graduate Research Assistant

- Advisor: Professor David Rubin
- Research: Sextupole nonlinearity effects on ultra relativistic charged beam dynamics
- Designed High Tune Optics using computer modeling
- Managed the High Tune Experiments at CESR
- Developed an algorithm and supporting code for optimizing the sextupole magnet field distribution for long lifetime of the circulating beams

August 1988 - May 1990

Physics Department, Cornell University; Ithaca, NY

Teaching Assistantships

- Teaching assistant for four semesters plus one summer session

Summers 1986-1988

Physics Department, University of Delaware; Newark, DE

Undergraduate Research Assistant

- Advisor: Professor Robert N. Hill
- Thesis: The Hydrogen Atom in a Strong Magnetic Field
- Applied classical mathematical methods for problem solving
- Developed software to evaluate the bound states of hydrogen atoms in strong magnetic fields

EDUCATION

- Cornell University, Ithaca, NY — Ph.D. in physics, January 24, 1994
- Cornell University, Ithaca, NY — Master of Science in physics, January 15, 1992
- University of Delaware, Newark, DE — Bachelor of Science in physics, Degree with Distinction, Magna Cum Laude, May 28, 1988 (**earned degree in just three years**)

AWARDS AND RECOGNITION

- Consistently rated outstanding or distinguished in work performance
- Supplemental Performance Award — November 2014
- Award winning lobby app — November 2013
- Hen Hatch 2013 semifinalist — February 2013
- Ten Year Service Award ORNL — January 2012
- Significant Event Award ORNL — September 2009
- Oak Ridge Associated Universities Center for Science Education Certificate of Appreciation — July 31, 2009
- Supplemental Performance Award ORNL — May 2008
- Five Year Service Award ORNL — January 2007
- Significant Event Award ORNL — March 2005
- SNS Safety Award — February 2005
- SNS Appreciation Award — December 2004
- Significant Event Award ORNL — March 2003
- Supplemental Performance Award ORNL — July 1, 2002