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Summary

- Software Developer (Rails, Ruby/C++/Java)
- Design/Build Private & Hybrid Clouds
- Enterprise Integration Expert (Chief Architect for \$30MM J2EE project in the Energy Industry)
- 3D Modeling/Simulation/AI Expert
- Ph.D. Physics

Employment History**Cloud Architect**

Archethought (Austin, TX)

2010–Present

Archethought is a consulting firm specializing in designing and building **private and hybrid clouds** for colleges and universities around the world. This helps universities take advantage of more efficient Virtualization technologies, provide infrastructure as a service within the university, and safely explore various emerging Digital Library technologies.

Design and Deliver all software, networking, configuration and monitoring needed to set up and support a Cloud Computing System, Storage Systems, and cloud-based High Performance Computing Systems. Help integrate the Cloud Computing System with existing systems and applications throughout the university environment.

This includes a web-based (Rails) Cloud Management Console with account, instance, image, and storage management.

Technology Used:

Eucalyptus, AWS/EC2 API, RightAWS, Ruby, Rails, Chef.

Chief Scientist

Agile Dynamics (Austin, TX)

2005–Present

Agile Dynamics is a consulting firm specializing in **data-driven decision making**, helping businesses adopt a more quantitative view of everyday business decisions. We provide the leadership, business acumen, and technical expertise necessary to adapt business processes and implement the enterprise software needed to support this process across various different industries.

Designed and built a **data-driven decision support system** for the Jamaican Ministry of Education. This USAID-sponsored project serves primary and secondary educational institutions throughout the nation and gives the Ministry previously unknown visibility into the state of education on the Island. This application was built using Rails and scales dynamically in EC2 using Chef.

Designed the next generation of application for a company offering Fleet/Inventory Tracking services. This company provides web services and whitelabel web portals to track assets using their proprietary GPS tracking hardware. The new design helped prepare for **integration into Machine to Machine (M2M) data market**.

Provide **ad-hoc data-munging** services to a variety of businesses. Designed/built web-based bulk data importers for textbook distributors to manage inventory from publishers with various proprietary and standard (ONIX) formats. Designed/built web-based bulk data importers for a game company wanting a portal for customers to manage game content.

Provide **social network integration** services to help today's businesses migrate away from traditional marketing models and embrace a new role as part of a community of customers. This includes management consulting and the development of web-based applications and Facebook apps using Ruby on Rails.

Provided quantitative marketing tools and services for the visualization and **modeling of social networks**. Allowed for trend identification and analysis, growth rate predictions, and what-if scenarios for various network and Web-2.0 businesses. This was developed using Ruby/MySQL with Rails/GraphViz visualization.

Provided environmental simulation and modeling solutions to track pollutants in the Florida Everglades. Created numerical **hydrodynamic mass balance models** that are used to calculate tax incentives/penalties for surrounding commercial land. This was developed using Java/SWT/WebStart and interfaced with a variety of legacy apps and databases.

Technology Used:

Ruby, Rails, Java, SWT/JFace.

Chief Technology Officer

Rational Systems (Houston, TX)

2002–2005

Developed business models for the Energy Industry and then designed / developed systems to implement these models. For regulated energy utilities, this allows for efficient daily operations and longterm optimization decisions. Directed delivery of two complete product lines, Rational Pipe(TM) and Rational Catalyst(TM), from conception.

Rational Pipe is software designed to **manage the commercial activities of interstate natural gas pipelines**, including contracts, CRM, tariffs, capacity release, nominations, allocations and invoicing. It was the result of a 140+ man-year, joint development project between Rational Systems and a major US interstate natural gas pipeline, utilizing Rational's Rights-Based engine (pat pending).

Chief Architect for this \$30M project delivered on time and on budget. Provided Technical leadership for a team of approximately thirty developers and twenty testers. Directly developed components across the system, including: gas flow, physical pipe, scheduling, and the JMX-based system management console.

Rational Catalyst is a business simulation and analysis framework used in energy production, exploration, and gathering. It is software that enables **collaborative business modeling** by integrating small disparate models of various aspects of the business together making model data available across the enterprise. Catalyst packages data mining, revision control for both data and models, and various visualization tools including configurable executive dashboards into one complete package for business analysis.

Chief Architect for the Rational Catalyst team of four developers and two testers. Directly developed add-in interface components for Microsoft Excel 2000 using MFC/ATL/COM plugins in C++.

Technology Used:

Java, C#, C++, J2EE Design/Development, .NET, Business modeling, MFC, ATL, COM, Tibco, SQLServer 2000 with Analysis Services, Enterprise Hardware (Compaq/HP) running Windows 2000 Server, Windows 2003 Server, Red Hat 9 and Fedora Core 2-3, Microsoft SharePoint, Linux.

Lead Software Architect

The AEGIS Technologies Group, Inc. (Austin, TX)

2000–2002

Principal architect of AEGIS' AcsIXtreme(TM) product line, a suite of **commercial simulation tools** based on the industry standard ACSL(TM) (Advanced Continuous Simulation Language). Leader of a development team responsible for refactoring and modernizing the ACSL language as well as developing a complete modern development environment for simulation engineers. Responsible for coordinating all technical activities and artifacts throughout the lifecycle of the project.

Directly developed software components across the product line: for ACSL language translation, compilation, interpretation, symbolic mathematical manipulation, numerical integration and analysis, numerical optimization, build management, simulation execution management, communications infrastructure (using both distributing and componenting technologies), and developing user interface component APIs.

Technology Used:

C/C++, C#, Java, .NET, MATLAB, VB, FORTRAN, UNIX and Win32 systems programming, MFC, COM/DCOM, CORBA, SOAP, HLA, ANTLR, lex/yacc, UML, RUP, GoF design patterns, object-oriented design, component-based design, Windows .NET, Various flavors of UNIX/Linux (some components native, UI(MFC) components ported using Bristol porting tools).

Software Developer

Wesson International, Inc., now Adacel Technologies, Ltd. (Austin, TX)
1996–1998

Responsible for creating and maintaining realistic aircraft movement and intelligent pilot behavior in a multi-platform, scaleable **air traffic control (ATC) simulator**.

Integrated tower ATC, radar ATC, and flight simulators in order to simultaneously train tower controllers, radar controllers, and pilots. Distributed the system using CORBA and the US Defense Department's High Level Architecture (HLA). Spearheaded the simulator port to C++ on a POSIX-compliant kernel.

In addition to movement and pilot intelligence in a soft real-time environment, responsibilities included on-site customization for systems installed in Alaska and Hong Kong, graphics programming using SGI's IRIS Performer toolkit, and developing networking tools to assist in distributing the simulators.

Technology Used:

C/C++, Tcl/Tk, UNIX and Win32 systems programming, (soft) real-time process scheduling/event management, resource conflict resolution/management, network programming using TCP/IP and NetBIOS, Silicon Graphics O_2, Onyx Reality Engine, and Onyx2 Infinite Reality high-end graphics systems running IRIX(UNIX), i386 hardware running Linux, Win95, NT-4.0, and an in-house real-time OS over DOS/4GW.

Education

Ph.D. in Physics, 2000

The University of Texas at Austin

- Dissertation: "Dynamical Stability of Quantum Algorithms." Supervisor: E.C.G. Sudarshan

Created a numerical model to characterize noise in Grover's quantum search algorithm. This model was then used to determine the maximum amount of noise that the bare algorithm can tolerate before failing. This is useful in determining exactly which emerging technologies will prove to be viable for implementing quantum computers.

Technology Used:

C++, Perl, BASH script, LaTeX, numerical solutions to ODEs, randomization, various matrix calculations (using blitz+, TNT, and LAPACK).

B.S. in Physics, 1992

The University of Texas at Austin

B.S. in Mathematics, 1992

The University of Texas at Austin

- Thesis: "Path Integration on Multiply Connected Configuration Spaces." Supervisor: Ce'cile DeWitt-Morette

Publications

- Luis J. Boya, Mark Byrd, Mark Mims, E. C. G. Sudarshan. "Geometry of n-state systems, pure and mixed". *J. Phys.: Conf. Ser.* 87 012006. 2007.
- Mark Mims. "Dynamical Stability of Quantum Algorithms". *Dissertation, ISBN:0-493-13630-4*. The University of Texas at Austin. 2000.