Derrick Tobias Babb

Advanced Solutions Architect for Business and Gaming Applications

dtbabb@opst.com | 305-767-7967 | http://op.st/people/derrick

OBJECTIVE

Apply a skillset spanning the disciplines of Computer Science, Industrial Engineering, and Mathematics with enthusiasm for leading teams in overcoming difficult, high-value engineering problems.

EDUCATION

Computer Science PhD, University of Central Florida, Orlando, ABD
Industrial & Systems Engineering PhD, University of Florida, Gainesville, ABD
Computer Science MS, University of Central Florida, Orlando, 12/05
Industrial & Systems Engineering MS, University of Florida, Gainesville, 8/11
Mathematics BS, University of Florida, Gainesville, 8/11
International Business BA, Rollins College, Winter Park, 5/02

PROFESSIONAL EXPERIENCE

Director, Operational Streamlining (OPST)   **Feb 2014 – Present**

- Architect of cross-platform business and gaming solutions for web, mobile, land-based, and emerging virtual reality platforms. Actively engaged in the research, development and commercialization of solutions that simplify complex C++-based projects. The results of this work include:
    - A sophisticated asynchronous execution framework—effectively JavaScript promises reimagined for C++, combined with a complete set of barrier-style functions including map, filter, and reduce integrated with OpenMP. The paramount design objectives were syntactic simplicity, cross-platform interoperability, and scalability ranging from clustered computing to single-threaded execution in a browser via Emscripten—see https://big-pro.opst.com.
    - A Vulkan Toolkit prototype based on the aforementioned async framework.
    - An asynchronous database abstraction prototype with preliminary Oracle driver; the intent is to replace the almost 30-year ODBC API with a technically superior solution that captures the various next generation features of modern DBMS.
- Experienced in Angular-based UX/UI frontend/backend development. Extensive knowledge of TypeScript and project deployment processes including Webpack and Google Cloud.

- Expert in cross-platform C++ development (Android, iOS, Linux, OS X, and Windows—both standalone and Qt-based solutions). Extensive knowledge of test-driven development best-practices.

- Experienced in .NET Core cross-platform development leveraging C#/Xamarin and backend development using ASP.NET with Azure deployment.

- Experienced in cross-platform Unity game engine application development and deployment.

- In-depth understanding of open-source libraries, particularly Boost.

- Extensive full-stack JavaScript/TypeScript development experience.

- Extensive experience with Oracle DBMS, logical/physical data modeling, advanced SQL, and Quest Toad Data Modeler.

- Knowledgeable in compiler design and language parsing.

- Intermediate experience in shader development using GLSL.

- Knowledgeable in virtual reality application development for Oculus Desktop, Oculus Mobile and SteamVR as well as cross-platform audio implementation.

- Extensive knowledge of the Google V8 and WebKit JavaScriptCore JavaScript engines. Intermediate knowledge of Google Angle graphics API emulation project.

- Knowledgeable in VMware virtualization infrastructure design and implementation.

- Extensive requirements gathering, functional/technical design, and project management experience.

- Intermediate experience drafting business method and software patents.

Lead Software Architect, Aristocrat Technologies (via OPST)   October 2017-July 2019

- Worked with the Aristocrat Platforms Team in Austin to push the cutting edge for delivering gaming experiences across the disparate platforms of web, mobile and land-based machines; requiring strong design and implementation skills in both C++ and TypeScript/JavaScript.

- Lead architect of a first-of-a-kind unified platform for TypeScript-based games that integrates both the Google V8 and WebKit JavaScriptCore engines with a custom WebGL-to-OpenGL emulation layer; providing standalone or Unity embedded deployment. In-depth knowledge of Android and iOS mobile development was required as well as focused knowledge of Unity low-level plugin development.
    - Managed project scorecard estimates and prioritized all work.
    - Implemented WebGL-to-OpenGL emulation.
    - Took over and finished in two weeks a WebAudio-to-OpenAL implementation that another contractor struggled with for 6 months.

- Developed a cross-browser video decoder supporting alpha channels and integrated game loop control using FFMPEG and the Emscripten toolchain.

- Provided troubleshooting expertise for Angular-based projects.
- Prepared preliminary patent application and collaborated with attorney to finalize submission.

Senior Maximo Consultant, Enbridge Energy (via OPST)   Apr 2014 – October 2017
- The fifth consultant brought onto a project that was 2 years in with an exhausted budget and nonworking Maximo implementation.
- Performed extensive data clean-up and restructuring using custom RMI-based utilities that saved hundreds of man hours.
- Revamped workflow into an extensible solution that easily incorporates various business processes.
- Implemented high-value customizations including:
    - A virtual run hours meter mechanism used to drive preventative maintenance based on downtime and asset status changes.
    - A workflow-integrated solution for capturing and managing compression unit blowdowns for exacting regulatory compliance.
    - A tiered inspection work order generation algorithm.
- Implemented vertical and horizontal clustering that isolates the UI, integration, mobile, cron task and reporting aspects of Maximo while providing redundancy and scalability; combined with disaster recovery failover from Houston to Dallas.
- Executed a complex site extraction from an external Maximo instance to migrate a separate but similar business unit.
- Handled use case, requirement, and design document development.
- Provide ongoing production support.

Senior Maximo Consultant, TransCanada (via OPST)   Oct 2016 – Mar 2017
- Provided SME support for heavily customized Maximo environment during the transition to SAP following the acquisition of Columbia Pipeline Group.
- Implemented custom RMI-based tools and underlying processes to handle various procurement-related reassignments within Maximo stemming from rapid organizational change.
- Implemented various safety nets to capture integration issues between Maximo and external systems. One such safety net caught over a million dollars' worth of lost invoices when first activated.
- Prepared data for SAP migration.

Lead Maximo Developer, NiSource (via IBM Corporation)   Nov 2009 – Feb 2014
- Implemented 63 enhancements and 65 revisions involving the user interface, external system integrations, and back-office data handling.

- After 300 days of operation, one back-office enhancement that automated PO closure handled $50,000,000 in POs, representing $500,000 in freed working capital and saving the labor required to manually close 6,000 POs—saving at least one FTE annually.

- Another back-office enhancement implemented a framework for defining criteria to automate receipting of invoices that were received from the Catalyst external system operated by BNY Mellon. Since its introduction 4 years prior, this enhancement generated 150,000 receipts representing $70,000,000—again, saving at least one FTE annually.

- Developed a SOAP-based web-service from the ground-up that enabled offline receiving of materials in the field. The solution was achieved by connecting a custom Excel spreadsheet with the web-service via SOAP and connecting the web-service with Maximo via RMI. The initial design leveraged the Maximo Integration Framework, however this was found to bypass user restrictions due to the hardcoded usage of the MAXADMIN user in Maximo 6.2. The web-service was reimplemented from the ground-up using RMI to connect with Maximo, allowing operations to be performed as the invoking user, and deployed alongside Maximo on the application server.

- Implemented a user interface application that allowed Supply Chain to quickly determine the invoice-receipt state of a purchase order by line.

- Maintained 245 individual source files representing 40,413 lines of code as well as 16 reports.

- Independently maintained an IBM Rational Team Concert (RTC) implementation to manage change promotion across 5 environments as well as Production changes introduced during a system upgrade spanning 10-months. Additionally, I prepared an extensive proposal to implement RTC within the enterprise based on the performance of this system.

- Implemented and trained the development team to follow a Model-Driven Design process using IBM Rational Software Architect.

- Maintained workflow and TRM Rules Manager for the Procurement module—this spanned the Purchase Requisition, Request for Quotation, Purchase Order, Invoice and Receiving Applications.

- Maintained 14 out of 23 total external system integrations. This included:
  - Maintaining a custom punch-out application that interfaced Ariba vendor sites with the Purchase Requisition application.
  - Outbound integrations with PeopleSoft for sending purchase orders, invoices and receipts.
  - Inbound integrations with PeopleSoft for receiving company records and general ledger accounts.

- Maintained 5 environments—Development, System Test, User Test, Production and Training—encompassing 18 servers and 20 Maximo instances. The Production environment supported 2000+ users. I developed a deployment tool consisting of 75 scripts to administer these environments and handled change promotion activities.

- Developed a testing tool that generated test cases based on real data. This tool helped to identify anomalous behavior in changes before promotion to Production that were the result of bad data and would have otherwise been missed by unit\system\user testing.

- Technical lead for Maximo 6.2.2 to 6.2.6 upgrade:
    - Migrated Java customization and screen configurations.
    - Developed gold image for deployment.
    - Operated Maximo and TRM Rules Manager upgrade tools.
    - Refined database upgrade sub-process.
    - Debugged upgrade issues.
    - Developed 33-page upgrade document.
    - Performed Production upgrade.

- Developed extensive project plan for Maximo 6.2.6 to Maximo 7.5.1 upgrade.

- Developed extensive understanding of the core Maximo 6.2 source code, debugging and performance testing practices. Collaborated in the remediation of several software bugs with the IBM Maximo Development Team before Maximo 6.2 end-of-service.

- Trained four global resources to perform Maximo development.

- Proficient with Oracle 10g and SQL in general.

- Familiar with both WebLogic and WebSphere.

Project Manager & GIS Developer, NiSource (via IBM Corporation)   **Jul 2009 – Nov 2009**

- Led four-person team in knowledge transfer for multi-year ESRI ArcGIS implementation.

- Played key role writing and winning $2,750,000 support contract.

GIS Developer, NiSource (via IBM Corporation)   **Aug 2008 – Jul 2009**

- Aided GIS implementation team with planning and development.

- Distilled ad-hoc system build and maintenance processes into soundly documented, optimized processes.

- Implemented ArcObject-based tools that enhanced build and manageability.

- Built complex pre-production GIS environments.

- Identified and mitigated project risks.

Intern, NASA Marshall Spaceflight Center   **May 2008 – Jul 2008**

- Developed novel mathematical model of composite-overwrapped pressure vessels using strain data from optical fiber Bragg grating sensors.

- Employed complex geometric analysis, numerical calculus and non-linear optimization.
- Implemented prototype in C++ on UNIX using open-source nonlinear optimization software with OpenGL visualization.
- Won Second Place for research among engineering interns.

Graduate Researcher, University of Florida **Jan 2008 – May 2008**
Department of Industrial & Systems Engineering
- Implemented three-stage, eleven-objective optimization framework for NP-Hard scheduling problem in C++.
- Integrated CPLEX via Concert C++ technology for solving large-scale mixed integer linear programs.
- Produced quality approximations to large-scale problem instances.

Graduate Researcher, University of Central Florida **Jan 2004 – Aug 2007**
Departments of Computer Science and Industrial Engineering
- Awarded $100K research grant from Florida Department of Transportation.
- Led collaborative effort between Florida Department of Transportation, University of Central Florida and the Center for Urban Transportation Research at the University of South Florida.
- Implemented high-performance sequential as well as parallel scheduling and routing algorithms.
- Developed statistical models for origination\destination demand pairs based on real paratransit service data.
- Utilized open-source software, relational databases, OpenGL-based visualization and MPI for high-performance computing on a 32-node Sun Fire cluster computer. - Produced quarterly and final technical reports.

Graduate Researcher, University of Central Florida **Aug 2006 – Mar 2007**
Department of Industrial Engineering
- Research funded by National Science Foundation.
- Developed prototype for product design expert system based on paper published by team under tight time constraints and demoed prototype at national conference.

PROFESSIONAL CERTIFICATION

IBM Certified Adv. Deployment Professional - IBM Service Management Asset Management V5
IBM Certified Infrastructure Deployment Professional - Maximo Asset Management V7.5
IBM Certified Deployment Professional - Maximo Asset Management V7.5
IBM Certified Deployment Professional - Tivoli Process Automation Engine V7.5 IBM
Certified Solutions Expert - Collaborative Lifecycle Management V4

SELECTED HONORS AND AWARDS

2006-2008   Robert D. Kersten Fellow
2000   Clint Foundation Scholar
1999-2002   Florida Bright Futures Scholar
1999   Eagle Scout

TEACHING EXPERIENCE

Spring 2005 Graduate Teaching Assistant and Lab Instructor. COT 3100: Introduction to Discrete Structures. School of Computer Science, University of Central Florida.

Spring 2003 Graduate Teaching Assistant. CDA 5106: Advanced Computer Architecture. School of Computer Science, University of Central Florida.

PUBLICATIONS

D. Babb (2008). "Composite-Overwrapped Pressure Vessels: Towards High Resolution In Situ Structural Health Monitoring Using Optical Fiber Bragg Grating Sensors." *Poster*.

K.I. Meza, L.L. Crumpton-Young, C.D. Geiger, R.L. Hoekstra, S.E. Schubert, D.T. Babb, "The Development of a Conceptual Design Environment to Support User Centered Design Considerations," 2007 International Conference on Design Principles and Practices, Imperial College London University, London, England, Jan 4-7, 2007.

K. Meza, S. Schubert, D. Babb, H. Eskandari, L. Crumpton-Young, C. Geiger, R. Hoekstra, "Towards the Development of a Conceptual Modeling Multi-Criteria Analysis Environment to Support User Centered Design", 2007 Institute of Industrial Engineers Annual Research Conference, Nashville, TN, May 19-23, 2007.

D. Babb (2005). "Vehicle Routing Problem with Time Windows Pickup, Transfer, and Delivery: Introduction and Initial Approaches." *Internet Draft*.

D. Babb (2005). "Pickup and Delivery Problem with Time Windows, Coordinated Transportation Systems: The State of the Art." *Internet Draft*.

KEY COURSES AND TRAINING

Computer Science
COT 5404 Design and Analysis of Algorithms
CDA 5110 Parallel Architecture and Algorithms
COP 5537 Network Optimization (Graph Theory)
CDA 5106 Computer Architecture I
CDA 6107 Computer Architecture II
CDA 5501 Network Design I
CDA 6520 Network Design II
CAP 5636 Artificial Intelligence
CAP 5415 Computer Vision

CAP 5512 Evolutionary Computation

COP 6731 Advanced Database Systems

EEL 5937 Multi-Agent Systems

Industrial Engineering

ESI 6546 Stochastic Modeling and Analysis

ESI 6912 Fundamentals of Mathematical Programming (Nonlinear)

ESI 6417 Linear Programming and Network Optimization

ESI 6418 Linear Programming and Extensions

ESI 6321 Applied Probability Methods in Engineering

ESI 6358 Decision Analysis

EIN 6425 Scheduling & Sequencing

EIN 5140 Project Engineering

ESI 5531 Discrete System Simulation

EIN 6336 Production and Inventory Control

EGN 5858C Rapid Prototyping and Product Realization

Mathematics

MAP 5304 Intermediate Differential Equations

MAA 4211 Advanced Calculus I

MAA 4212 Advanced Calculus II

MAS 4301 Abstract Algebra

MAD 4401 Numerical Analysis

MAS 3106 Linear Algebra

MAP 2302 Differential Equations

MAC 2313 Calculus & Analytic Geometry III

ORGANIZATIONS

Association for Computing Machinery (ACM)

Institute of Electrical and Electronics Engineers (IEEE)

Institute for Operations Research and the Management Sciences (INFORMS)