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# GINA ACCAWI

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## PROFILE

Gina Accawi has over twenty-five years of experience in the field of software engineering and software architecture. During her tenure at ORNL, her focus has been architecting, developing, and managing teams of developers to deliver software solutions in support of the scientists and engineers at the laboratory. The focus of most of her work is constructing applications to perform energy consumption analysis and make straightforward suggestions or allow side-by-side comparisons to reduce usage.

## SKILLS

Career experience focused on porting legacy applications to newer frameworks and toolsets - reproducing and expanding functionality, simplifying user experience and facilitating ease of access to datasets while extending the life of existing software solutions.

Adept in providing hands-on leadership, building and developing unified, productive and cohesive teams to achieve project deliverables.

Expertise in management, project planning, systems architecture, technical training, large venue presentations, and technical writing.

## RECENT EXPERIENCE

SENIOR TECHNICAL STAFF MEMBER – 2017 - PRESENT  
R&D STAFF MEMBER – 2009 - 2017

### Key Projects:

- Weatherization Assistant - Software team lead, architect and developer
- MEASUR - Software team lead, architect and developer
- FuelEconomy.gov - IT Support, architectural support, and advisor
- Building Science Advisor - Software architect and developer
- National Household Travel Survey - Software architect and developer
- Energy Savings and Moisture Transfer Calculator - Software architect and developer
- ESCO Selector - Software architect and developer

### Key Achievements:

- Finalist for R&D 100 Award in 2019 for Building Science Advisor (BSA)
- Conducted resume review, initial interview, and proactive in hiring computer science professionals to support EERA program
- Software architect supporting diverse researchers and engineers from various specialties: building science, building envelope, transportation science, fuel economy and distributed active archive center for biogeochemical dynamics
- Ongoing mentorship for the SULI, CCI, ORISE, ORAU and ASTRO programs
- Mentor for two sequential capstone project collaboration with Tennessee Tech University for the Advanced Manufacturing Office, EERE program
- Management of project porting numerous Windows applications to either web applications or Electron

- Solo implementation of several jHipster (Java, JPA, MySQL, Angular) applications
- Design and implementation of numerous using web services consumers and providers
- Design of numerous databases for MySQL, SQL Server and MariaDB
- Design of web service interface to perform energy audits using the NEAT engine
- Establishing team software processes: use of SVN then transition to Git repository, deployment scripts, code merge

#### NOTABLE PUBLICATIONS

1. Ahl, Amanda, et al. "Occupant Behavior for Energy Conservation in Commercial Buildings: Lessons Learned from Competition at the Oak Ridge National Laboratory." *Sustainability*, vol. 11, no. 12, 2019, p. 3297., doi:10.3390/su11123297.
2. Boudreaux, Philip, et al. "A Rule-Based Expert System Applied to Moisture Durability of Building Envelopes." *Journal of Building Physics*, vol. 42, no. 3, 2018, pp. 416-437., doi:10.1177/1744259117750370.
3. Shrestha, Som, Desjarlais, Andre Omer, Dalglish, Laverne, Ng, Lisa, Hun, Diana E., Emmerich, Steve, and Accawi, Gina K. Sun . "Moisture Transfer in Commercial Buildings Due to Air Leakage: A New Feature in the Online Airtightness Savings Calculator". United States. <https://www.osti.gov/servlets/purl/1607126>.
4. Boudreaux, Philip R., Pallin, Simon B., Antretter, Florian, Accawi, Gina K., Desjarlais, Andre Omer, Werling, Eric, and Salonvaara, Mikael. Sun . "The Building Science Advisor: Providing expert advice on building envelope systems". United States.
5. Malhotra, Mini, Im, Piljae, Accawi, Gina, Ternes, Mark, and MacDonald, Mike. Wed . "Multifamily Tool for Energy Audits (MulTEA) Engineering Manual (Version 1)". United States. doi:10.2172/1476423. <https://www.osti.gov/servlets/purl/1476423>.
6. Ternes, Mark P., Langley, Brandon R., Accawi, Gina K., and Malhotra, Mini. Sun . "Health and Safety Audit Design Manual". United States. doi:10.2172/1415917. <https://www.osti.gov/servlets/purl/1415917>.
7. Malhotra, Mini, MacDonald, Michael, Accawi, Gina K, New, Joshua Ryan, and Im, Piljae. Thu . "National Energy Audit Tool for Multifamily Buildings Development Plan". United States. doi:10.2172/1037628. <https://www.osti.gov/servlets/purl/1037628>.

#### PRESENTATIONS

- RETS Community, Conference; 2008: Data Mapping with XSLT
- RETS Community, Conference; 2007: SOAP, WSDL, XSD and XSLT
- RETS Community, Conference; 2005 and 2006: XSD
- Microsoft Corporation, MN Campus; 2006: Getting Real with Ajax

- Microsoft VSLive, NY; 2002: XQuery (Delivered by Tom Barnaby)
- Microsoft Regional Offices, Chicago, IL; 2002: Understanding XML
- Microsoft Regional Offices, Minneapolis, MN; 2002: Understanding XML
- Intertech, Inc. MN Campus; 2002: Java APIs for XML
- Microsoft Regional Offices, Minneapolis, MN; 2002: XML Transformations Demystified
- Microsoft Corporation, MN Campus; 2001: Remote Scripting and Beyond
- Microsoft Regional Offices, Minneapolis, MN; 2001: Understanding Web Security

## EDUCATION

University of Tennessee, Knoxville - BS Mathematics, Computer Science minor - August 1993

## PROFESSIONAL EXPERIENCE

Oak Ridge National Laboratories, Oak Ridge, TN 2009 - Present

Senior Technical Staff Member, Research and Development

Division Cyber Security Officer (DCSO)

Residential, Commercial & Industrial Energy Efficiency Building Technologies Research and Integration Center

I have been working as an R&D Senior Technical Staff at ORNL since January 2017, and as a Research and Development Staff member at ORNL since June 2009. I have over 25 years of experience in architecting and building software solutions on a variety of platforms: from mainframe to web. I have over 10 years of management experience with software architects, engineers, developers, and students. My particular expertise centers on building teams with the skills to both succeed and grow, while meeting deadlines and building software. During my time at ORNL, I make software framework choices, write code using numerous programming languages and frameworks, build and lead teams working on numerous projects:

Other projects include: building a web service for calculating white roof coating energy savings, building web versions of Excel reports, generating PDFs from XML data - including graphs and charts, and scripting data imports.

Current work involves a new web application, which will be used for conducting energy audits of multifamily buildings, expanding the reach of the entire suite of tools available for energy auditors in the US DOE (Department of Energy) Weatherization Assistance Program. The latest project is especially interesting from a software architecture standpoint, as the core of the energy audit computation is done on a remote server, hosted in the cloud, with service requests via SOAP and a WSDL (Web Services Description Language) API. I am pleased to bring this experience in architecting service-oriented solutions to the domain of energy audit.

In a management role, I am overseeing the porting of legacy Windows applications to the Electron framework. There have been three developers and two engineers working on the specification and implementation. I manage the developers, coordinate with the engineers, conduct meetings and demonstrate progress. Included in my responsibilities: locating and interviewing candidate developers, researching and selecting the best

solution for the redesign, meeting with the project sponsor and program managers, and writing documentation. The tools will be available as Open Source with an MIT license upon completion. The first tool was the Desktop Digitizer, which provides the capability of importing digital curves and allows for retrieving x,y coordinates then downloading them as cvs files. I oversaw the development of the tool. It is available at <https://code.ornl.gov/r6i/desktop-digitizer>.

#### Key Achievements:

- Management of large-scale project porting numerous Windows applications to Electron
- Implementation of several Angular applications solo
- Integration of systems using web services
- Top to bottom implementation of a Multifamily building audit web application, MulTEA.
- Port and normalization of an MS Access database to MySQL.
- Implementation of a Health and Safety evaluation tool for HUD Healthy Homes
- Design of web service interface to perform energy audits using the NEAT engine
- Establishing team software processes: use of repository, deployment scripts, code merge

#### FALCON TECHNOLOGIES, COQUITLAM, B.C., CANADA 2007 - 2009 CONSULTANT

Active member of the Real Estate Transaction Standard community. Continuing work with the National Association of Realtors, both designing and implementing XML Schemas for the standard payloads for the Data Schemas workgroup. Presented on XML Schemas, SOAP, and WSDL in 2007 at the RETS conferences. Presented on the use of XSLT in data mapping in August 2008 at RETS conference.

Additionally, worked on a project developing Ajax web application using MVC architecture, Struts framework and the Yahoo! User Interface developer toolkit. Primary responsibility within the web project was the View. Web application development done in Java environment on both Windows and Mac operating systems running WebLogic.

#### Key Achievements:

- Key implementer for the RETS Data Schemas Workgroup and Syndication Workgroup.
- Discovered, designed, and implemented extensibility mechanism to provide both instance and schema type extensibility.
- Designed and implemented View using both XSLT and Freemarker templates.
- Implemented XHTML Strict compliant pages, using CSS and Freemarker to create page layouts.
- Implemented Ajax features for web application utilizing YUI.

#### MARKETLINX SOLUTIONS, KNOXVILLE, TN 2004 - 2006 DEVELOPMENT LEAD

Management of two distinct development teams: one research and development team working in .NET, the other a team enhancing and supporting a legacy web and ISAPI application, a RETS (Real Estate Transaction Standard) server. Provide leadership and organization for both teams.

#### Key Achievements:

- Member in the RETS community. Presented on XSD at the April 2005 RETS conference in New Orleans and at the August 2006 RETS conference in Chicago.
- Began work managing only one developer on one team. Within six months, responsibility was increased to managing two teams comprised of two Quality Assurance team members, seven developers, and one architect.
- Integrated RETS application management into company process and schedule. Organized team to support the product and provide regular updates in tandem with database and parallel product changes.
- Responsible for web applications for more than 25 different accounts and numerous third parties.
- Assumed leadership on a project behind schedule with numerous missed deadlines. Created project task list, negotiated features, provided task time estimates, coordinated work with multiple developers, defined necessary resources to try to meet those goals.
- Diagnosis and troubleshooting of ASP.NET web application in C#
- Delivered new feature within months of beginning work with the R&D team.
- Written and presented proposals to executive staff defining requirements for project resources, hardware, software, and QA testing.

#### STAFF IT / SCRIPPS NETWORKS, KNOXVILLE, TN 2003 - 2004

##### CONSULTANT

Consultative services via Staff IT for Scripps Networks, implementing new features and upgrading existing HGTV, Food Network, DIY and Fine Living Web applications. Software and database development in SQL and TCL working with Oracle database.

##### Key Achievements:

- Integral member of team charged with deploying new DIY network Web site; implemented key portions of site.
- Offered a permanent position as Senior Software Engineer at Scripps Networks.
- Boosted learning curve for re-architecture project by presenting XML overview to developers.
- Co-designed new architecture with fellow senior team member. This new architecture was a J2EE implementation of a web service.
- Provided expert knowledge of XML and XML-related technologies in addition to understanding of Microsoft windows client applications.

#### INTERTECH, INC., MINNEAPOLIS, MN 1999 - 2003 FULL TIME (FREELANCE ONGOING THROUGH 2007)

##### SENIOR TECHNICAL TRAINER

Created an achievement-oriented learning environment, training groups of up to 25 software developers from new programmers to seasoned architects. Composed quality up-to-date curriculum and materials for a multitude of courses and presentations. Delivered presentations which held audience's interest on a broad range of technical subjects. Instructed classes on design methodologies of Ajax, XML, XML using Java, Visual Basic, OOA&D, and ASP. Taught the fine points of additional diverse topics, including COM, COM+, .NET, Web Secu-

rity, Web Services, and Architecture of n-tiered applications. Traveled to client sites nationwide.

Key Achievements:

- Record of measurable and sustainable results, teaching programmers the principles of XML to improve systems.
- Served as subject matter expert and primary resource for XML for fellow trainers and students.
- Maintained an extremely high-level of student satisfaction, consistently generating positive feedback.
- Delivered leading edge presentations to diverse clients including Microsoft offices, Wells Fargo, Best Buy and Java User Groups.
- Drafted company newsletter articles and began writing XML and .NET Namespaces book.
- Authored presentation on XML Query that was accepted for VSLive 2002.
- Recruited as a Software Developer and was promoted to Senior Technical Trainer due to outstanding job performance.
- Began by instructing OOA&D course and quickly progressed to earning area of expertise in XML.
- Served for a short time as president of the Twin Cities Java User Group.

#### **SOLOINIS (FORMERLY QUALITY DATA SYSTEMS), MINNEAPOLIS, MN 1997 - 1999** **WEB DEVELOPER**

Optimized performance of database-driven Web application, providing technical expertise for product development, implementation, and maintenance. Sustained proper functionality of IIS 4.0 Web server. Rendered consultative services, devising workable solutions to server configuration problems for internally hosted sites.

Key Achievements:

- Modified and reengineered QDS corporate presence site and Intranet Web site.
- Enabled initiation of workflows by implementing ASP to use Keyflow components.

#### **WEST GROUP, EAGAN, MN 1994 - 1997** **SENIOR SOFTWARE ENGINEER**

Served as intranet Webmaster, leading the design, deployment, and administration of Server Technology Group's intranet. Utilized existing code and all benefits of COM to develop dual-interfaces for component. Directly accountable for modifying existing legacy system, including programming in PL/I, developing specifications, and executing designs. Bolstered quality control efforts, planning/conducting tests and synthesizing system integration revisions.

Key Achievements:

- Organized and led Intranet Task Force to pioneer internal web based communication.
- Key player on design team, responsible for re-architecting a mainframe print system as an object-oriented application.
- Implemented portions of new system design using COM and C++.

## CORE COMPETENCIES

Experience Level	Topic
<b>Advanced</b>	Java, C, C++, JavaScript, PHP, HTML5, XML (and related), web services, database design, SQL, JPA, Maven, Ant, macOS, Tomcat, Apache
<b>Intermediate</b>	Angular, Node.js, Electron, JHipster, .NET, Ubuntu, IIS, Windows , Chart.js, Sencha, CSS, bash, node, npm, GitHub, GitLab, RHEL, TypeScript
<b>Beginner</b>	Python, PhoneGap, Ionic, Jenkins, AppVeyor, Docker, D3, R

Advanced: 7 or more years

Intermediate: 3 to 7 years

Beginner: Up to 3 years