

Richard Welch

algorithm development • multithreaded design & development • cluster computing
parallel programming • machine learning/computational intelligence • neural networks
image compression • time series prediction • performance optimization

4800 Osage Dr. #28, Boulder, CO 80303 | (303) 834-7205 | rich.welch@gmail.com

- Experience**
- Scientific Programmer 2010-2011
Parallel Scientific, Boulder, CO (startup)
- Developed, benchmarked and optimized multithreaded C code for use in a large cluster parallel environment
- Software Application Developer, BREEZE Software 2009-2010
Trinity Consultants, Dallas, TX (primarily telecommute)
- Developed parallel implementations of computationally intensive models
 - Designed and developed applications to support business processes and client needs
- Graduate Research Assistant/GAANN Fellow 2007-2009
Missouri University of Science & Technology, Rolla, MO*
- Developed computational intelligence techniques to facilitate the integration of distributed renewable energy sources onto the grid
 - Taught graduate level course in computational intelligence
- Research Intern Summer 2008
National Renewable Energy Lab, Boulder, CO
- Verified connections of microgrid switching equipment
 - Planned, designed, and built test equipment and scenarios
- Computer Programmer/Analyst 2003-2007
Missouri University of Science & Technology, Rolla, MO
- Designed and developed applications to support business processes
 - Participated in regular code peer reviews and change management
 - Supported user community via phone, e-mail, ticket system, in-person sessions, and faculty forums
 - Deployed, maintained, administered & supported third party enterprise systems and related infrastructure, including performing version upgrades and performance tuning
- Education**
- Missouri University of Science & Technology**
- Electrical Engineering, M. S.** GPA 3.40 2006-2009
Relevant Courses: Digital Signal Processing, Parallel Programming with MPI, CI Methods & Game Theory
- Computer Engineering, M. S.** GPA 3.29 2003-2006
Relevant Courses: Computational Intelligence, Adaptive Critic Designs, Embedded Processor Design
- Computer Science, B. S. & Computer Engineering, B. S.** GPA 3.37 1998-2003
Relevant Courses: Data Structures I & II, Computer Organization, Computer Architecture & Assembly, Operating Systems, Networking, Multimedia Systems, Microprocessor System Design, Database Systems, Mathematical Modeling, Numerical Methods, Software System Development, Object Oriented Numerical Modeling

* Missouri University of Science & Technology is formerly known as the University of Missouri-Rolla or the Missouri School of Mines & Metallurgy

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- Projects**
- Optimal Distributed Energy Resource Controller 2007-2009
 - Neural network-based solar insolation/wind speed forecasting
 - Optimal Photovoltaic (PV) System Controller 2004-2007
 - Neural network-based approach to PV system control
 - Used Adaptive Critic Design (ACD) to optimize power distribution
 - Commodity Charting and Analysis Tool 1999-2003
 - Designed and wrote commodity charting and analysis software tool
 - Client-server model where server processed and filtered data before sending on to client charting tool for display and analysis
 - Digital Image Watermarking Algorithm 2002
 - Created robust watermarking algorithm with minimal image degradation
 - MATLAB Interpreter 2001
 - Developed C++ based command-line interpreter for MATLAB code using Backus-Naur grammar
 - Image Compression Software 1997-1999
 - Lossless/lossy compression algorithm rivaling JPEG compression ratio
 - Regional Science Fair winner and International Science Fair entry

- Publications**
- Welch R., Venayagamoorthy G. K., "Energy dispatch fuzzy controller for a grid-independent photovoltaic system", *Energy Conversion and Management*, Vol. 51, No. 5. (May, 2010), pp. 928-937.
 - Venayagamoorthy G. K., Welch R., "Energy dispatch controllers for a photovoltaic system", *Engineering Applications of Artificial Intelligence*, Vol. 23, No. 2. (March, 2010), pp. 249-261.
 - Welch R., Ruffing S., Venayagamoorthy G. K., "Comparison of Feedforward and Feedback Neural Network Architectures for Short Term Wind Speed Prediction", IEEE-INNS International Joint Conference on Neural Networks 2009, Atlanta, GA, USA, June 14-19, 2009
 - Welch R., Venayagamoorthy G. K., "Optimal Control of a Photovoltaic Solar Energy System with Adaptive Critics", IEEE-INNS International Joint Conference on Neural Networks 2007, Orlando, FL, USA, August 12-17, 2007
 - Welch R., Venayagamoorthy G. K., "A Fuzzy-PSO Based Controller for a Grid Independent Photovoltaic System", IEEE Swarm Intelligence Symposium 2007, Honolulu, HI, USA, April 1-5, 2007

Computer Languages & Skills	C/C++	SQL	Perl	MPI
	Java	XSL/XML	VB.NET	MATLAB
	CUDA	Subversion/SVN	Fortran	VMWare