# Richard B. Wells
# CURRICULUM VITAE
### University of Idaho

**NAME:** <u>Wells</u>, Richard B.        rwells@uidaho.edu                **DATE:** Nov 30, 2023

**RANK OR TITLE:** Emeritus Professor of Electrical and Computer Engineering
Emeritus Associate Chair, Dept. of Electrical & Computer Engineering
Emeritus Professor of Neuroscience
Emeritus Adjunct Professor of Materials Engineering
Emeritus Adjunct Professor of Philosophy

**DEPARTMENT:** Electrical and Computer Engineering

**OFFICE LOCATION AND ZIP:** 8105 S. Diego Way        **PHONE:** (208) 562-0489
Boise, ID 83709        **FAX:** none
**EMAIL:** rwells@uidaho.edu

**DATE OF FIRST EMPLOYMENT AT UI:** August 1981 (Affiliate Professor of Electrical Engineering)

**DATE OF TENURE:** July 1, 1999

**DATE OF PRESENT RANK OR TITLE:** July 1, 2013 ( Emeritus Professor)

**EDUCATION BEYOND HIGH SCHOOL:**

**Degrees:**

Ph.D., Electrical Engineering, May 1985, University of Idaho, Moscow, Idaho
M.S., Electrical Engineering, May 1979, Stanford University, Stanford, California
B.S. (with distinction), Electrical Engineering, May 1975, Iowa State University, Ames, Iowa

**Certificates and Licenses:**

Registered Professional Engineer, State of Idaho (ret.)

**EXPERIENCE:**

**Teaching and Research Appointments:**

Emeritus Professor, July 1, 2013-present
Professor of Electrical & Computer Engineering, July 1, 2006-June 30, 2013
Adjunct Professor of Philosophy, University of Idaho, July 1, 2006-June 30, 2013
Professor of Neuroscience, University of Idaho, July 1, 2006-June 30, 2013
Adjunct Professor Materials Science & Engineering, University of Idaho, July 1, 2006-June 30, 2013
Adjunct Associate Professor of Philosophy, University of Idaho, August 2005-June 30, 2006
Associate Professor of Neuroscience, University of Idaho, August 2003-June 30, 2006
Adjunct Associate Professor Materials Science & Engineering, University of Idaho, September 2000-June 30, 2006
Associate Professor Electrical & Computer Engineering, University of Idaho, July 1999-June 30, 2006
Affiliate Professor Physiology & Biophysics, University of Washington School of Medicine, February 2004-2015
Assistant Professor, University of Idaho, July 1993-June 1999
Affiliate Professor, University of Idaho, August 1981-June 1993

**Academic Administrative Appointments:**

Associate Chair of ECE, Jan. 2008-June 30, 2012

Director, Neuroscience Program, July 1, 2006-June 30, 2009
Associate Director, MRC Institute, Sept. 1996-June 30, 2011
Founder and Director, Wells Laboratory for Computational Neuroscience and Mental Physics
Founder and Director, Laboratories for Computational Neuroscience and Technology Research, MRC
    Institute.
Founder and Director of Laboratory for Communication and Information Engineering in the MRC
    Institute.
Founder and Director of Laser Electrophotography Laboratory in the MRC Institute.

### Non-Academic Employment including the Armed Forces:

Project Manager - Research and Development, Hewlett Packard Co. Disk Memory Division, Boise, Idaho,
    1991-93. Managed product and process development for disk memory products. Direct supervision of
    13 engineers and technicians. Managed an annual project budget of $5 million. Responsible for all
    business and technical aspects of product.
Manufacturing Engineering Manager (Level 62), Hewlett Packard Co., Disk Memory Division, Boise,
    Idaho, 1989-91. Managed manufacturing engineering group responsible for support of HP's Storage
    Solutions Products. Managed a group of 35 engineers, technical supervisors, technicians, and
    documentation specialists. Responsible for all manufacturing aspects of $300 million/year factory
    operations.
Development Engineer (Level 61) and Project Leader, Hewlett Packard Co., Disk Memory Division, Boise,
    Idaho, 1986-89. Responsible for design work and for technical planning and scheduling for R&D
    product development work on disk drive products. Design work included product architecture,
    subsystem specifications, device and subsystem modeling and analysis, control system and
    electronics design, the design of special purpose digital signal processors, and DSP firmware
    development.
Development Engineer (Level 60), Hewlett Packard Co., Disk Memory Division, Boise, Idaho, 1979-86.
    Responsible for product development/design of disk memory products. Design work included system
    level and circuit level design of both analog and digital circuitry, and microcontroller firmware
    design.
Development Engineer (Level 60), Hewlett Packard Co., Corporate Engineering, Cupertino, California,
    1978-79. Responsible for architecture and design of mass storage controller hardware and firmware.
Development Engineer (Level 60), Hewlett Packard Co., Delcon Division, Mountain View, California,
    1975-78. Responsible for analog and digital circuit design and firmware development for
    communications test equipment.
Management Development Program Intern, Northwestern Bell Telephone Co., Des Moines, IA, 1974.

## TEACHING ACCOMPLISHMENTS:

### Areas of Specialization:

Circuits, Electronics, System Theory, Coding & Information Theory, Computational Neuroscience, Kant's
    Critical Philosophy

### Courses Taught:

BIOL 508: Topics in Neuroscience Seminar, F08
ECE 310: Electronics I, F05
ECE 410: Electronics II, F04, F06
EE 414/514: Analog Integrated Circuits Analysis and Design, F93, F94
EE 415/515: Advanced Analog Integrated Circuits, S94
ECE 416: Applications of Linear Integrated Circuits, F12
ECE 450: Signals & Systems II, S(V)04, S(V)05, S(V)06, S07, F08(V), F09(V) (developed)
ECE 452: Communication Systems, S(V)11, S(V) 12
EE/ECE 455: Information and Coding Theory, S(V)97, S98, S99, S(V)00, S01, S02, S10(V) (developed),
F12
ECE 470: Control Systems, F(V)10, F(V) 11
ECE 554: Theory of Error Correcting Codes, F(V)10

ECE 555: Information Theory, S(V)05, S(V)08, S(V)10, S(V) 12
EE/ECE 556: Adaptive Signal Processing, S(V)95, S(V)97, F(V)00, F(V)02, F(V)04, F(V)07, F(V)09, F(V) 11 (developed)
ECE 557/NEUR 521: Biological Signal Processing, S(V)04, S(V) 06, S(V) 07, S(V) 09, S(V)11 (developed)
EE 212: Electrical Circuits, S84
EE 316: Electronics I, F92, S02
EE 317: Electronics I Laboratory, F92
EE 318/410: Electronics II, S93, S96
EE 319: Electronics Laboratory, S93, S96
EE 330: Electromagnetics, S94, S96
EE 350: Signals and Systems, F88, F89
EE 404/504: Special Topics – Digital Data Storage Systems, S(V)99 (developed)
EE 404: Introduction to Magnetic Recording, F81 (developed)
EE 450: Digital Data Storage Systems, F00 (developed)
EE 452: Introduction to Communication Systems, S95, F95, F96, F(V)97, F98, F(V)99, F(V)01
EE 453: Communication Systems Laboratory, F97, F98, F99 (developed)
EE 504: Special Topics, Biological Signal Processing, S(V)03 (developed)
EE 550: Communication Theory I, F94, F(V)96, F(V)98, S(V)01 (developed)
EE 554: Information Theory I, F95, F(V)97, F(V)99, F(V)01, F(V)03, (developed)
EE 555: Information Theory II, S(V)98, S(V)00 (developed)
EE 591: Electrical Engineering Research Colloquium, S99, F99
ME 481: Control Systems, F(V)10
NEUR 508: Topics in Neuroscience Seminar, F06, S07, F07, S08, F08, S09
PHIL 404 Historical Figures: Kant, F05 (developed)

**Students Advised:**

Undergraduate Advising:

     AY – 11-12 – 67
     AY – 10-11 – 22
     AY – 09-10 – 20
     AY – 08-09 – 20
     AY – 07-08 – 27
     AY – 06-07 – 25
     AY – 05-06 – 21
     AY – 04-05 – 28
     AY – 03-04 – 26
     AY – 02-03 – 42
     AY – 01-02 – 25
     AY – 00-01 – 22
     AY – 99-00 – 16
     AY – 98-99 – 14
     AY – 97-98 – 21
     AY – 96-97 – 13
     AY – 95-96 – 25
     AY – 94-95 – 18

**Graduate Students Major Professor:**

B. Lungsi Sharma, Ph.D. NEUR., "Determination of an Embedding Field Theory Based Minimal Neural Network Anatomy Capable of Generating Equivalence Relations for the Function of Comparation and Associated Proxy Functions for Other Noetic Processes," Dec., 2013.
Albert H. Carlson, Ph.D. C.S. (co-advisor), "Set Theoretic Estimation Applied to the Information Content of Ciphers and Decryption," May 15, 2012
Feng Xie, Ph.D. E.E., "A Micromagnetic Model of Barium Ferrites for Microwave Circulator Design," June, 2006.

Lan Nguyen, Ph.D., E.E. "An Adaptive Algorithm for Simultaneous Canceling Doppler Shift, Amplitude Jitter, and Phase Jitter in Satellite and Mobile Communication Systems," April 2006.

Bruce Barnes, Ph.D. E.E., "Mixed-Signal and Analog Biomimic Neurons in CMOS," December 2005.

Akaraphunt Vongkunghae, Ph.D. E.E., "Automatic Resolution Enhancement Template Generation Optimizing Image Appearances," December 2004.

Jang Ho Yi, Ph.D., E.E. "Numerical Simulation of Monocomponent Dry Toner Development Physics in Gap Jump Laser Electrophotography by a Phenomenological Method," November 2002.


Alhasan Alsaammare, M.S.E.E., "Relaying technologies and resource allocation for next generation mobile broadband communication systems," May, 2013.

Domenic Dipaola, M.S.E.E., in progress

Richard Hill, M.S. NEUR, in progress.

Billy Clabough, M.S. E.E., "Using heuristics and cumulative fitness to improve circuit optimization performed by genetic algorithm," Oct. 10, 2012.

Robert Moerke, M.S.E.E., "A sensor conditioning system using a fourteen bit, multibit quantizer sigma-delta ADC," June 6, 2012.

B. Lungsi Sharma, M.S. NEUR., "Incorporating phenomenological larger scale, level-coded model adaptive properties into a smaller scale model to achieve an adaptive pulse-coded model that is closer to physiology," June 27, 2011.

Sang-Hoon Choi, M.S.E.E., "Transient category formation in a directed-learning ART2 network," Aug., 2009

Ronald Crummett, M.S.E.E., "Exploration of CDMA usage in a MIMO underwater communication system," May, 2007.

Leili Baghaei Rad, M.S.E.E., "Channel equalization in underwater acoustic communications using multiple antennas," August, 2006.

Franco Fabile, M.S.E.E., "Template Minimization," December 2005.

Steve Cohen, M.S.E.E., "The role and function of non-linear preprocessing in adaptive noise cancellation of a canine electrogastrogram," November 2005.

Phik Wei Low, M.S E.E., "Numerical Simulation of Monocomponent Dry Toner Physics in Gap Jump Laser Electrophotography by a Digital Filtering System," August 2005.

Balaji Margabandu, M.S.E.E., "Hebbian Based Learning Algorithm for Pulse Coupled Neural Networks," July 2005.

Priyank Gupta, M.S.Cp.E., "VLSI Layout Design Methods and Considerations for Mixed-Signal Pulse-Coded Neural Networks, April 2005.

Feng Xie, M.S.E.E., "A Micromagnetic Model of Hexaferrite and Some Simulation Result," July 2004.

Ying Zhou, M.S.E.E., "The Design of the NIATT Controller Interface Device," May 2000.

Jang Ho Yi, M.S.E.E., "A Xerographic Simulation Model," June 1999.

Hua Lin, M.S.E.E., "An Image Extraction and Recognition System Using Neural Networks," May 1999.

Aaron Brennan, M.S.E.E., "Binary Connectionist Networks," July 1998.

Steve McCarthy, M.S.E.E., "Nonlinear Channel Modeling in High-Density Magnetic Recording," July 1996.

Gary Bartles, M.S.E.E., "A Set-Membership Approach to Sequence Decoding," June 1996. (ABT)

Mark Laverty, M.S.E.E., "A VLSI Template Generator and Search Engine," May 1996.


Kelly Dean Griffiths, M.E.E.E., 2013

Scott Haymore, M.E.Comp.E., in progress (reassigned due to my retirement)

Winder, Daniel M.E.E.E., May, 2013

Edward Stengel, M.E.E.E., inactive.

Brandon Garbus, M.E.E.E., Nov. 2011, "Memristors"

Richard Dunn, M.E.E.E., May, 2011, "Hyperspectral scene clustering using the Eckhorn Model"

Aatif Nawaz, M.E.E.E., April 2010.

Aditya Manchikanti, M.E.E.E., December 2008.

Aneesh Nandi, M.E.E.E., August 2007.

Ben Sharon, M.E.E.E., August 2006, "Calculation of Coverage in RF Mobile Communications".
Stan Buelt, M.E.E.E., April 2006, "Training an Artificial Neural Network Using Genetic Algorithms."
Diane Nelson, M.E.E.E., April 2006, "Stress Effects on Bandgap Reference Circuits."
Venkata Ayyagari, M.E.E.E., December 2004.
Kosal Svy, M.E.E.E., December 2004.
Bryce Poole, M.E.E.E., May 2004.
Abdurrham Alyabes, M.E.E.E., May 2004.
Selu Gupta, M.E.E.E., July 2000.
David B. Meisner, M.E.E.E., May 1999.
Thang Pham, M.E.E.E., May 1995.

**Graduate Students Committee Member:**

Robert Charles Morris, Ph.D., C.S., in progress at the time of my retirement.
Roger Lew, Ph.D. Neuroscience, "Assessing cognitive workload from multiple physiological measures using wavelets and machine learning," Dec. 2013.
Kun Yang, Ph.D., Physics, in progress at the time of my retirement.
Song Liu, Ph.D., E.E., in progress at the time of my retirement.
Thomas Nickles, Ph.D., Environmental Science, "Subaerial Lithic Microbial Habitats as Potential Astrobiological Analogs," July 11, 2011.
Daniel Evans, Ph.D., C.S., "Parameterized computational imaging: Optimized, data driven, and time-varying multiphysics modeling for image extension," 2009.
Stanley P. Gotshall, Ph.D., C.S., "Evolutionary Training of a Biologically Plausible Spino-Neuromuscular System Model," August, 2007.
Sung-Hoon Gee, Ph.D., M.Sci.E., "Spherical Barium Ferrite Nanoparticles and Barium Ferrite Film," Aug. 24, 2007.
Ryan Seamus Adams, Ph.D., EE, "Simulation, Design, and Fabrication of Microwave Ferrite Components for Monostatic Radar Applications," July, 2007.
Dong Yu, Ph.D.C.S., "A Novel Alert Correlation and Confidence Fusion Framework in Intrusion Detection Systems," April 2006.
Luigi Giancarlo Corti, Ph.D., M.E., "Design and Micro-Fabrication of High Speed Micro-switches," December 2005.
Mun Park, Ph.D., M.Sci.E., "Electron-Beam Patterned Sub-Micron Magnetic Elements and Switching Mechanisms," May 2005.
Zhen Li, Ph.D., C.E., "Assessing the feasibility of using hardware-in-the-loop real time simulation in the signal timing design process, December 2003.
Jie Dai, Ph.D.C.S., "Logic Based Policy Engineering in Distributed Authorization," December 2001.
Feng Lin, Ph.D.E.E., "Research and Design of Low-Jitter, Wide Locking-Range All-Digital Phase-Locked and Delay-Locked Loops," May 2000.
Ted W. Barnes, Ph.D.E.E., "Adaptive control of the magnetic disk drive servo," 1991.

Michael W. Audens, M.S.E.E., in progress at time of my retirement.
Shitij Tejpal, M.S.C.S., in progress at time of my retirement.
Gavin Abo, M.S.E.E., in progress at time of my retirement.
John Porter, M.S.E.E., "A Novel Approach to Gait Optimization of a Quadruped Robot Through Evolutionary Computing," Aug., 2010.
Jeff Otto, M.S.E.E., "Application of Impedance Conversion Circuitry for Real-Time Tuning of a Tracking Side-Branch Resonator," May, 2010
Cyril Oluwagbenga Ige, M.S.E.E., "Feasibility of the use of a Piezoelectric Composite Diaphragm Terminated Tracking Side Branch Resonator," Nov. 2008.
Benton Kyle O'Neil, M.S.E.E., "Self-biased Microstrip Y-Junction Circulator Design Using Effective Cavity Models and Power Ratios," Aug. 2007.
Roberto Enrique Bolaños, M.S.E.E., "Design, Simulation, and Layout of an Analog CMOS Pulse Width Modulator," July, 2007.
Kaylani Merrill, M.S. Neuroscience, "A neurocognitive architecture for autonomous agents in multi-agent systems," May, 2007.

Kaylani Merrill, M.A.PHIL (non-thesis), May, 2007.

Roger Lew, M.S. Psychology, "Motion transparency and visual direction cues affect heading perception and control," May, 2007.

Isaac Spurgeon Kodavaty, M.S.M.E., "Validity of image source approximation for modeling underwater acoustic channels with a soft bottom," Sept., 2006.

Jennifer Joy, M.S.C.S., "A Content Guard for Adobe Portable Data Format (PDF)," August, 2006.

Todd Smith, M.S., M.Sci.E., "An Electrical and Metallurgical Copper Barrier Film Study of CVD Ti-N-Si Against PVD Ta," December 2005.

Mandava Rajashekhar, M.S.E.E., "A New Simulation Method for VLSI Pulse Coded Neural Networks Using VHDL," December 2005.

Ryan S. Adams, M.S.E.E., "Bandwidth Optimization of an Integrated Microstrip Circulator and Antenna Assembly," October 2005.

Stanley Gotshall, M.S.C.S., "Hypothesis Testing in an Evolutionary Spino-Neuromuscular System," May 2005.

Bo Liu, M.S.E.E., "VLSI Design of Feed Forward Fully Connected Neural Network," May 2005.

David Mohs, M.S.C.S., August 2004, "Problem Transformation and Adaptation Based on Infrastructure Mapping."

Sai, Konduri, M.S.E.E., May 2004, "Implementation of pulse-coded neural networks using a CMOS neuron."

Anindya Bhattachari, M.S.E.E., "Forgetful logic and its applications in the VLSI implementation of pulse-coded neural networks, May 2004.

Michael Harrison, M.S.C.S., "Using co-evolution to improve the fault tolerance of sorting networks," May 2004.

Dustin Erickson, M.S., M.M.Engr., "Growth and Characterization of Sputter Deposited Barium Ferrite Films," December 2003.

Vamshi Krishna Venapally, M.S.C.S., September 2003. "Kernel Level Anomaly Detection System"

Ying Yin Chen, M.S.C.S., "Application of Neural Networks to Character Recognition," August 2003.

David Hunter, M.S.Comp.E., "Parity-N Solutions using Feedforward Neutral Networks," July 2003.

Rob Morris, M.S.C.S., "Attribute Classification and Reduction for a Real-Time Misuse Intrusion Detection System," June 2003.

James W. Sterbentz, M.S.E.E., "Analytical Model Design of an Ideal, Three-port Self-Biased, Microstrip Microwave Circulator," April 2003.

Latha M. Mohan, M.S.Co.E., "A Video-Based Method for the Detection of Truck Axles," June 2002.

Sreekanth Malladi, M.S.C.S., "A General Scheme To Prevent Replay Attacks on Security Protocols," May 2002.

Scott Ward, M.S.E.E., "ESD Testing," May 2002.

John Determan, M.S.C.S., "Automatic Expert System Rule Generation on Nondestructive Waste Assay Data," December 2000.

Gang Xiao, M.S.C.S., "Early Stopping Byzantine Agreement in LAN based Network Environments," October 2000.

Xiao Hui Wang, M.S.C.S., A Cluster Approach to Distributed Byzantine Agreement," December 1999.

Yuesheng Hou, M.S.C.S., "Study on Application of Byzantine Early Stopping Approach to Fault-Tolerant Network Systems," June 1999.

Herschel Shelton, M.S.C.S., "The Transis and Totem Approach to Fault Tolerant Communication," April 1999.

Steve Seubert, M.S.M.E., "Passive Damping of Spinning Disks," October 1998.

Paul Coffelt, M.S.C.E., "Traffic controller interface signal optimization conversion and coordination utility," May 1998.

Yuan Ho, M.S.C.S., "Partial order state transition analysis for an intrusion detection system," June, 1997.

Brent Keeth, M.S.E.E., "A novel architecture for advanced high density dynamic random access memories," May 1996.

Roberta Fothergil, M.S.E.E., "Optimal estimation of position and attitude for mobile robots," April 1996.

Joan Miller, M.S.E.E., "Adaptive image processing utilizing neural networks, May 1995.

Chinh D. Ho, M.E.E.E., in progress at time of my retirement.
Ming Fai Lai, M.E.E.E., in progress at time of my retirement.
Gregory Hauser, M.E.E.E., April 2010, "Neural Networks Assist in Early Aircraft Detections
David Oaks, M.E.E.E., May 2007.
Yichao Ye, M.E.E.E., May 2006.
Kun Yang, M.E.E.E., May 2006.
Laura Watson, M.E.E.E., May 2005.
Charles Sniadecki, M.E.E.E., May 2004.
Jeff Allgood, M.E.E.E., May 2004.
Keith Carlson, M.E.E.E., February 2004.
Blair Thompson, M.E.E.E., May 2003.
Miguel Moreno, M.E.E.E., May 2003.
Darren Neal, M.E.E.E., May 2002.
Paul Paracka, M.E.E.E., May 2002.

**Courses Developed:**

ECE 450: Signals & Systems II
NEUR 521/ECE 557: Biological Signal Processing
EE 453: Communication Systems Laboratory
ECE 455: Information and Coding Theory
EE 504 ST: Biological Signal Processing
EE 550: Communication Theory
ECE 554: Coding Theory
ECE 555: Information Theory
ECE 556: Adaptive Signal Processing
PHIL 404ST: Historical Figures - Kant

**Monograms, Tutorials, and Other On-Line Materials Developed** (http://www.mrc.uidaho.edu/~rwells/)**:**

Wells, R.B., *The Idea of Justice*, Nov. 30, 2023
Wells, R.B., *Mathematics and Empirical Science*, Dec. 24, 2019
Wells, R.B., *Faith and Critical Theology*, May 11, 2019
Wells, R.B., "On the Dark Age Ancestry of the Wells Family," Mar. 7, 2017
Wells, R.B., *Civic Free Enterprise*, December 29, 2016
Wells, R.B., "The Consent of the Governed," December 12, 2016
Wells, R.B., "Heterarchical Organization and Management," 2015 (posted 11/30/2016)
Wells, R.B., "Why People Think," November 14, 2016
Wells, R.B., *Carmichael Subdivision Irrigation System Handbook*, 2016
Wells, R.B., *Unabridged Glossary of the Critical Philosophy and Mental Physics*, 5th ed., 2016
Wells, R.B., *30 Generations of Wells'*, 2nd ed., 2016
Wells, R.B., *30 Generations of Wells'*, 1st ed., 2015
Wells, R.B., *The Institution of Public Education*, vol. 3 of *The Idea of Public Education*, 2014
Wells, R.B., *Unabridged Glossary of the Critical Philosophy and Mental Physics*, 4th ed., 2014
Wells, R.B., *Unabridged Glossary of the Critical Philosophy and Mental Physics*, 3rd ed., 2013
Wells, R.B., *Critique of the American Institution of Education*, vol. 2 of *The Idea of Public Education*, 2013
Wells, R.B., "Critical review of the Dewey-Bode applied philosophy of education, part IV: The Personal Dimension of the Learner," September 25, 2013.

Wells, R.B., "Critical review of the Dewey-Bode applied philosophy of education, part III: Tangible and Persuasion Socialization," September 16, 2013.

Wells, R.B., "Critical review of the Dewey-Bode applied philosophy of education, part II: Corporal and Intellect Socialization," August 31, 2013.

Wells, R.B., "Critical review of the Dewey-Bode applied philosophy of education, part I: Schooling and Society," August 1, 2013.
Wells, R.B., *Education and Society*, vol. 1 of *The Idea of Public Education*, 2012.

Wells, R.B., *The Idea of the Social Contract*, 2012.

Wells, R.B., *Unabridged Glossary of the Critical Philosophy and Mental Physics*, 2nd ed., 2012.

Wells, R.B., *Unabridged Glossary of the Critical Philosophy and Mental Physics*, 2011.

Wells, R.B., *Leadership*, 2010.

Wells, R.B., *Introduction to Biological Signal Processing and Computational Neuroscience*, 2010.

Wells, R.B., *The Idea of the American Republic*, 2010

Wells, R.B., *The Principles of Mental Physics*, 2009

Wells, R.B., *The Critical Philosophy and the Phenomenon of Mind*, Sept. 6, 2006,. http://www.mrc.uidaho.edu/~rwells/Critical Philosophy and Mind/

Wells, R.B., *Autobiography of a Maquoketa Boy*, 2008, http://www.mrc.uidaho.edu/~rwells/techdocs

Wells, R.B., "On the synthesis of disjunctive inferences of Reason," May 15, 2012

Wells, R.B., "The role of Standpoints in applied metaphysics," May 7, 2012

Wells, R.B., "Comparation in apprehensive imagination," July 22, 2011

Wells, R.B., "Preliminary discussion of the Martian 2 Program," July 5, 2011

Wells, R.B., "On critical representation in brain theory, Part II: General schema of knowledge representation," May 25, 2011

Wells, R.B., "The applied metaphysic of the somatic code,", June 16, 2011

Wells, R.B., "On critical representation in brain theory, Part I: Critique," May 25, 2011

Wells, R.B., "Weaver's model of communication and its implications," June 2, 2011

Wells, R.B., "On the derivation of an applied metaphysic," May 20, 2011

Wells, R.B., "On Critical doctrine of method in brain-theory," March 31, 2011

Wells, R.B., "On the synthesis of polysyllogisms in Critical Logic," April 21, 2011

Wells, R.B., "A lumped element modeling schema for metabotropic signaling in neurons," May 16, 2010.

Wells, R.B., "The Martian Program: 2009," June 9, 2009, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "The Sensorimotor System of a Martian," May 20, 2007, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "Affective Control of Learning Processes in Network System Architectures: A Research Project," May 15, 2007, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "Meanings Networks: A New Learning Paradigm for ART Network Systems Models," May 14, 2007, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., Nick Garrett, and Tom Richner, "Investigation of physiological mechanisms for linking field synapses," Oct. 13, 2006, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., Tianlai Lu, and Tim Montoya, "Signaling and propagation modes in highpass and bandpass neural network columns constructed from Eckhorn neurons," Moscow, Idaho: MRCI Technical Report, University of Idaho, Jan. 8, 2006, http://www.mrc.uidaho.edu/~rwells/techdocs.

Wells, R.B., "Cortical neurons and circuits: An introduction," April, 2005, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "Functional column research issues: Spatio-temporal binding and dynamic cortical organization," Mar., 2005, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "The Initiative for Dynamic Link Neurocomputing," February 23, 2004, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "Graph-theoretic structure identification in dynamic link architectures," Nov. 24, 2003, http://www.mrc. uidaho.edu/~rwells/techdocs.

Wells, R.B., "Preliminary discussion of the design of a large-scale general-purpose neurocomputer," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, November 14, 2003, http://www.mrc.uidaho.edu/~rwells/techdocs.

Wells, R.B., "Integrate and fire neuron model as a sensory neuron model," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, August 20, 2003, http://www.mrc.uidaho.edu /~rwells/techdocs.

Wells, R.B., "Kinetics and muscle modeling of a single degree of freedom joint II," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, August 13, 2003, http://www.mrc.uidaho.edu /~rwells/techdocs.

Wells, R.B., "Kinetics and muscle modeling of a single degree of freedom joint I," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, August 5, 2003, http://www.mrc.uidaho.edu /~rwells/techdocs.

Wells, R.B., "Spinal sensorimotor system IV," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, July 7, 2003, http://www.mrc.uidaho.edu/~rwells/techdocs.

Wells, R.B., "Spinal sensorimotor system III," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, June 17, 2003, http://www.mrc.uidaho.edu/~rwells/techdocs.

Wells, R.B., "Spinal sensorimotor system II," Moscow, Idaho: MRCI Technical Report, University of Idaho, MRC Institute, June 17, 2003, http://www.mrc.uidaho.edu/~rwells/techdocs.

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### Honors and Awards:

Outstanding Teacher Award, University of Idaho, Department of Electrical Engineering, May 1999.

Outstanding Teacher Award, U of I Engineering Education in Boise Program, May 1993.

## SCHOLARSHIP ACCOMPLISHMENTS:

### Areas of Specialization:

Neurocomputing Systems; Computational Neuroscience; Computer Modeling of Electrophotography Processes; Adaptive Optimization of RET Templates in High-Resolution Laser Printing; Kantian Modeling of Cognitive Processes for Pseudo-Natural Intelligence; Traffic Control and Operations; Microwave Ferrite Devices and Circuits.

### Refereed Publications:

### Textbooks:

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### Refereed Open Journals:

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**Undergraduate Research Poster Presentations Advised:**

Ramirez, Sarahi (2008), "Modeling the binding action of anti-methamphetamine monoclonal antibodies," Sigma Xi Annual Meeting and Student Research Conference, Nov. 20-22, 2008, Washington, DC

Bryant, Leslie, Daniel Page, and Jeffrey Schmitz (2008), "Computational modeling of sensorimotor learning in infants," Sigma Xi Annual Meeting and Student Research Conference, Nov. 20-22, 2008, Washington, DC

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Meredith, Cameron and Tom Richner (2005), "Cortical column modeling by evolutionary computing methods," (Richard B. Wells, mentor) *Student Poster Abstracts*, Sigma Xi Annual Meeting and Student Research Conference, Seattle, WA, Nov. 3-6, 2005, pg. 101 (Gold Ribbon Poster Presentation).

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**Dissertation:**

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**Presentations and Other Creative Activities:**

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Wells, R., "Preliminary Discussion of the Design of a Large-Scale General Purpose Neurocomputer," University of Idaho ECE Research Colloquium, December 1, 2003.

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Wells, R. "Engineering Education in the United States." Växjö International Workshop on Engineering Education, Växjö University, Växjö, Sweden, May 16-18, 1995.

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Yi, J.H. and R. Wells, "Print engine modeling," Printing Technology Conf., Hewlett Packard, Boise, Idaho, September 18, 2001.

## Patents:

Wells, R.B., D. Cox and A. Bhattacharya, "Forgetful Logic for Artificial Neural Networks," U.S. Patent Application Docket No. 03-012-01/1054 (approved for issue; UI declined to pay fee).

Wells, R.B. and B. Barnes, "Biomimic Artificial Neuron," U.S. Patent 7,080,054, July 18, 2006.

Wells, R.B., "Capacitor-free Leaky Integrator," U.S. Patent 6,903,594, June 7, 2005.

Barnes, T., and R. Wells. "Adaptive control system for a disk drive actuator." U.S. Patent No. 5,257,252, October 26, 1993.

Wells, R., C. Haibel, and R. Hilton. "Magnetic amplifier preregulator for linear power supplies." U.S. Patent No. 4,343,034, August 3, 1982.

### Copyrighted Software:

Wells, R. and J.H. Yi, "XgM Version 5," released July 30, 1999, University of Idaho, MRC Institute.

Wells, R., A.J. Brennan, and J. Yi. "XgM," computer simulation model for exposure and voltage profiling in laser electrophotography, released May 1998, University of Idaho, MRC Institute.

## Grants and Contracts Awarded:

Dakins, M (PI), JA Foster, P Joyce, RB Wells, C Williams, "S-STEM Bridge to Graduate Study in Interdisciplinary Sciences," $597,331, National Science Foundation, Sept. 1, 2008 – Aug. 30, 2012.

Wells, R. (PI), "REU Site: Computational Neuroscience and Technology Research Experience for Undergraduates," $267,338, National Science Foundation and the Department of Defense, March 1, 2007-Feb. 28, 2010.

Edwards, D., C.P. Liou, M. Anderson, M. O'Rourke, R. Wall, J. Frenzel, and R. Wells, "Developing Fleets of Autonomous Underwater Vehicles," $1,370,036 (Wells' part $65,000), Office of Naval Research, April 1, 2005-March 31, 2006.

Young, J., Y.-K. Hong, R.B. Wells, D. McIlroy, and W.J. Wei, "ONR Phase II AMFeR,"$1,053,000 (Wells' part $89,053), Office of Naval Research, January 1, 2005-March 30, 2006.

Wells, R., J. Frenzel, T. Soule, D. Stenkamp, and V. Kantabutra, "REU Site: Computational Neuroscience and Technology Research Experience for Undergraduates," $232,222, National Science Foundation, March 1, 2004-March 1, 2007.

Young, J., Y.-K. Hong, R.B. Wells, D. McIlroy, and W.J. Wei, "AMFeR,"$1,250,000 (Wells' part $160,000), Office of Naval Research, February 1, 2004-January 31, 2005.

Wells, R., and J.H. Yi, "Laser Electrophotography Research Program," $219,000, Hewlett Packard, November 2003.

Wells, R. "Electrophotography Research Program," $199,687, Hewlett Packard Co., November 2002.

Anderson, T. and R. Wells, "Acquisition of instrumentation for development of reliable technologies for harsh environments," $290,280, National Science Foundation, July 29, 2002.

Hong, Y.-K., R. Wells, D. McIlroy, W.J. Yeh, J. Young, B. Pesic and R. Smelser, "ONR-MMIC applications," $722,181 (Wells' part $55,003), Office of Naval Research, August 1, 2002.

Wells, R. (PI), B. Wilamowski, J. Frenzel, J. Foster, T. Soule, and V. Kantabutra, "Neuro-fuzzy soft computing via silicon structures," $1,364,192 (Wells' part: $409,000), NSF-EPSCoR, February 2002.

Wells, R. "Electrophotographic Research Program," $86,337, Hewlett Packard Co., November 2001.

Hong, Y.-K. (PI), B. Pesic, W.J. Yeh, D.N. McIlroy, R.E. Smelser, R.B. Wells, and J.L. Young, "Development of Hexaferrite Thick Films for MMIC Applications," $747,996 (Wells' part $59,914), Office of Naval Research, May 2001.

Wells, R. "Laser Electrophotography Research Program," $82,604, Hewlett Packard Co., November 2000.

Crawford, R. (PI), R. Wells (Co-PI), C. Wai, F. Cheng, and T. Anderson, "Grand Challenge: Measuring the Chemical Signature of Life," Jet Propulsion Laboratory, $250,000, December 1999.

Wells, R. "Electrophotographic Modeling and Signal Processing," $65,587, Hewlett Packard, December 1999.

Wells, R. "Computer modeling of laser xerography processes," $103,672, Hewlett Packard Co., May 1999.

Wells, R. "Controller Interface Device for Traffic Simulation," $225,000, University Transportation Centers Program, Research and Special Programs Administration, U.S. Dept. of Transportation, January 1999.

Wells, R. "Computer modeling of laser xerography processes," $130,674, Hewlett Packard Co., May 1998.

Wells, R. "Computer modeling of laser xerography processes," $49,766, Hewlett Packard Co., May 1997.

Peterson, J., and R. Wells. "Investigation of neural networks for graphics characterization," $136,883, Hewlett Packard Co., August 1996.

Wells, R. "Computer modeling and adaptive parameter optimization of exposure process in laser printers," $29,876, Hewlett Packard Co., June 1996.

Wells, R. "Equipment gift to establish communications laboratory," equipment gift, $300,000, Hewlett Packard Co., September 1995.

Peterson J., and R. Wells. "Investigation of neural networks for applications to printer formatters," $176,753, Hewlett Packard Co., Boise, Idaho, September 1995.

Wells, R. "Computer modeling of the exposure process in laser printers," $26,450, Hewlett Packard Co., Boise, Idaho, May 1995.

Wells, R. "Set distinguishability analysis of high-density digital magnetic recording for application to disk drives," $25,000, Maxtor Corp., Longmont, Colorado, April 1995.

Baker, R.J., and R. Wells. "ARPA/NSF silicon brokerage to support education," $5,720, ARPA/NSF, January 1995.

Peterson, J., and R. Wells. "Applications of neural networks to printer formatter applications," $51,400, Hewlett Packard, May 1994.

Wells, R. "Probabilistic decoding with set-distinguishing receivers," $12,000, NASA-SERC, September 1994.

Wells, R. "Set distinguishing receivers for data communications and magnetic storage," $6,000, University of Idaho Engineering Experiment Station SEED grant, August 1993.

**Honors and Awards:**

Certificate of Appreciation ("UI Faculty Mentor: University of Idaho Ronald E. McNair Post-Baccalaureate Achievement Program"), July 31, 2008.
Best Paper Award ("A Versatile Pulse-Mode Biomimic Artificial Neuron using a Capacitor-Free Integrate-and-Fire Technique"), IECON03, Roanoke, Virginia, November 6, 2003.
Best Paper Award in Signal Processing ("A Signal Processing Model for Laser Print Engines"), IECON02, Sevilla, Spain, November 5, 2002.
Editor's Choice Paper ("Measurement of microbial activity in soil by colorometric observation of *in situ* dye reduction: An approach to detection of extraterrestrial life"), *BMC Microbiology* 2002, 2:22.
Elected Senior Member, Institute of Electrical and Electronics Engineers, June 2001.
Outstanding Researcher Award, University of Idaho, Department of Electrical and Computer Engineering, May 2000.
Hewlett Packard Master Researcher, December 1999.

**SERVICE:**

**Major Committee Assignments:**

University Committees
    Search Committee, Interim Director of NIATT, Apr. '09-May '09.
    University Curriculum Committee (COE representative), Sept. '08-June 30, 2013
    UI Research Council (College of Engineering representative), Sept. '06-June '09

College of Graduate Studies
    University-Wide Program Directors Council, July, 2006-June, 2009.

College of Engineering:
    Tenure and Promotions Committee, October 2007-2009; Fall, 2010
    Curriculum Committee, August 2005- June 30, 2013; Vice Chair Sept. 2010-June 30, 2013

Electrical and Computer Engineering Department:
    Search Committee, Department Chair, February 2004-August 2004
    Search Committee, MRC IT Administrator; Chairman, July-August 2000
    ABET Output Assessment Committee, October 1999-May 2003; Chairman, Fall 2001-Fall 2002
    Graduate Committee, February 1996-June 30, 2009
    Curriculum Committee, August 2005-June 30, 2013; (Chairman)
    Curriculum Committee, September 1996-May 2001; Chairman, Fall 1998-May 2001
    Petitions Committee, September 1996-May 2001
    Petitions Committee, Boise, August 1993-May 1996
    Search Committee, Department Chair, August 1993-September 1994

Search Committee, April-September 1995
Boise Engineering Program Joint Faculty Committee, March 1995-October 19, 1995
Boise Engineering Certification Exam Committee, April 1995-October 19, 1995
Boise Engineering Program Library Liaison, August 1995-October 19, 1995

Mechanical Engineering Department:
Tenure Review Committee, October 2000-February 2001

Computer Science Department:
Tenure Review Committee, November 2003
Third Year Review Committee, April 2002

Neuroscience Program:
Curriculum Committee, Sept. 2009-June 30, 2013.
Policy Committee, July 2006-June 2009
Curriculum Committee, May 2003-Sept. 2006; (Chair, August 2005-August 2006)
Program Steering Committee, January 2003-May 2003

McNair Program:
Applicant Evaluator, Fall 2010

**Professional and Scholarly Organizations:**

Reviewer, *IET Communications*, 2010
Appointed Affiliate faculty, Department of Physiology & Biophysics, University of Washington School of Medicine, February 2004
Senior Member, Institute of Electrical and Electronics Engineers, 2001
IEEE Engineering in Medicine and Biology Society
IEEE Magnetics Society, Referee for *IEEE Transactions on Magnetics*
IEEE Information Theory Society
IEEE Neural Networks Society
IEEE Electron Devices Society
Reviewer, *IEEE Transactions on Neural Networks*
Reviewer, *IEEE Transactions on Signal Processing*
Reviewer, *International Journal of Computer Mathematics*
Sigma Xi
Phi Kappa Phi, Vice President, UI Chapter, 1997; President, UI Chapter, 1998-99
Tau Beta Pi
Eta Kappa Nu, President, Iowa State University Chapter, 1974-75

**Professional Service:**

NSF Panelist: Science Masters Program, Dec. 2009-Jan. 29, 2010.
Internal Reviewer, UI Student Grant Proposals, Nov. 2007.
Special Guest Editor, *Neural Networks*, Aug. 2007.
Member Internal University of Idaho Selection Committee for DoD-EPSCoR 2006.
Member Technical Review Committee, 2005 International Joint Conference on Neural Networks (IJCNN 2005).
Session Chair, 8th Annual Inland Northwest Philosophy Conference, Moscow, Idaho, April 1-3, 2005
Program Director, Research Experience for Undergraduates in Neuroscience Program, University of Idaho, March 2003-May 2011.
Internal Advisory Board Committee Member, Brain Organization, Sleep Function, and Cytokines Research Program, Washington State University, College of Veterinary Medicine, Dept. of Veterinary and Comparative Anatomy, Pharmacology, and Physiology, appointed January 17, 2003.
Co-chair, Special Session on Neuro-Fuzzy Soft Computing, *28th Annual Conference of the IEEE Industrial Electronics Conference (IECON'02)*, Sevilla, Spain, November 5-8, 2002.
Member, Technical Program Committee, *28th Annual Conference of the IEEE Industrial Electronics Conference (IECON 2002)*, Sevilla, Spain, November 5-8, 2002.

Focus Area Leader, Neurofuzzy Soft Computing Program, NSF-EPSCoR, February 2002-January 2005.

### Outreach Service:

Engineering Outreach:
Coordinator, Communication Systems Certificate of Completion Initiative, August 2000-Aug. 2010

### Community Service:

Upward Bound Math and Science Program Course: "Electrophotography," July 2001
Textbook Reviewer, *Theory and Design of Adaptive Filters* by Treichler, Johnson and Larimore, Prentice-Hall, September 2000
Upward Bound Math and Science Program Course: "Electrophotography," July 2000
Campaign Director, Marjorie Stuart Campaign, Ada County, Idaho District 14, 1990
Junior Achievement Advisor, Palo Alto, California, 1976-77

## PROFESSIONAL DEVELOPMENT:

### Teaching:

Writing to Improve Teaching and Learning Workshop, Moscow, Idaho, 1998

### Scholarship:

Lester and Agnes Schuldt Faculty Seminar on Technology and Humanity, Moscow, Idaho, May 22-23, 2001
Lester and Agnes Schuldt Faculty Seminar on Technology and Humanity, McCall, Idaho, May 17-19, 2000
Electromagnetic Compatibility, Henry Ott Seminar, Boise, Idaho, 1987
Servo Systems, Hewlett Packard Co., Boise, Idaho, 1983
Thermal Design, Hewlett Packard Corporate Engineering, Boise, Idaho, 1983
Reliability, Hewlett Packard Corporate Engineering, Boise, Idaho, 1982
The RTE Operating System, Hewlett Packard Co., Cupertino, California, 1977
The Motorola MC6800, Motorola, Inc., Sunnyvale, California, 1976

### Administration/Management:

Learning Outcomes and Assessments Training, University Inn, Moscow, ID, Nov. 28, 2006
2006 Applying Sound Research Administration Decisions (Department Grant Administrators), July 10, 2006, Moscow, ID.
2006 Applying Sound Research Administration Decisions (PI, Deans, and Directors), July 10, 2006, Moscow, ID.
7 Habits of Highly Effective People, Hewlett Packard Management Training, 1992
Managing Conflict, Wilson Learning Seminars, Boise, Idaho, 1991
Managing Diversity, Hewlett Packard Management Training, Boise, Idaho, 1989
Process of Management, Hewlett Packard Management Training, Boise, Idaho, 1989
Managing Interpersonal Relations, Hewlett Packard Co., Boise, Idaho, 1981
Managing Management Time, Hewlett Packard Co., Boise, Idaho, 1979