

## **Dr. Claire L. McCullough, PE**

Dept. of Computer Science and Engineering  
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### **PERSONAL:**

Citizenship--USA  
Security Clearance—TS/SCI (inactive)  
Registered Professional Engineer—Alabama, License No. 19356

### **EDUCATION:**

B.E. (E.E.), Vanderbilt University, 1980, summa cum laude  
M.S.E.E., Georgia Institute of Technology, 1981  
Ph.D. (E.E.), University of Tennessee, 1988  
Ph.D. Thesis: "Error Considerations in Distributed Estimation"

### **EXPERIENCE:**

Professor of Electrical and Computer Engineering, University of Tennessee in Chattanooga, August 2004 to present. Teach courses in standard areas in addition to pattern recognition and intelligent processing. Conduct research in applications of data fusion, including medical and military applications, publishing papers in these areas as well as accreditation and under-representation issues.

Acting Department Head, Computer Science and Engineering, May 2009-August 2009. Lead in the development and submission of ABET self-study reports for two currently accredited programs, and one program seeking new accreditation in fall, 2009. Interfaced with both faculty and administration regarding ABET accreditation and other issues. Handled budget and personnel issues, hiring one new faculty member during this period.

Associate Professor of Electrical Engineering, University of Tennessee in Chattanooga, August 1999 to 2004. Taught courses in such areas as Communications, Controls, and Signal Processing. Conducted research in areas including data fusion and intelligent control, and published papers in these areas. Mentored students and provided guidance in both technical and career matters. Provided leadership in the development of web pages, curriculum, and ABET assessment for the Electrical Engineering program. Principal investigator of "Adventures in Computers, Engineering, and Space," a program funded by the National Science Foundation, to attract women to engineering, computer science, and space sciences through middle school exposure to these fields. Principal Investigator of "Bridges to Engineering Science: Teaching Teachers," a planning grant from the National Science Foundation to develop a program to increase the number of under-represented students entering

engineering by inserting engineering science content into K-12. Provided leading edge research consulting services to industry and to the Department of Defense.

Senior Electronics Engineer, Sensors Directorate, U.S. Army Space and Strategic Defense Command, March 1995 to August 1999. Managed technology efforts in areas such as advanced radar components; microelectronic packaging for reduction of size, weight, and power; automatic target recognition and sensor data fusion for both airborne platforms and seeker applications, fusing information from conventional radar, infrared and ladar sources; and software development. Former action officer for the Discoverer II satellite groundstation program. Developed web pages for Sensors Directorate and applications. Served as resource person in the area of intelligent processing for the ERINT guidance processing unit IPT. Conducted research in the areas of data fusion and intelligent control, and published papers in these areas.

Senior Electronics Engineer, Advanced Technology Directorate, U.S. Army Space and Strategic Defense Command, March 1992 to March 1995. Managed engineering research in emerging technology areas such as neural nets, fuzzy logic, intelligent processing, and electro-optics, with small businesses, universities, and major defense contractors. Conducted research in the area intelligent control, and published papers in this area.

Assistant Professor of Electrical and Computer Engineering, University of Alabama in Huntsville, September 1988 to March 1992. Taught courses in electrical engineering, controls, and robotics. With a graduate student, designed, built, and tested a small mobile robot. For NASA, designed, simulated, and evaluated neural network and fuzzy logic controllers for a flexible beam. Developed and simulated a new method of adaptive neural net control for nonlinear systems, and a new type of anticipatory neuro-fuzzy control. Wrote and presented technical papers on these, and other aspects of controls and reliability. Designed and ran a program (funded by the National Science Foundation) to attract women and minorities to careers in engineering.

Instructor of Electrical and Computer Engineering, University of Tennessee, September 1983 to August 1988. Taught undergraduate courses in all aspects of electrical engineering, including controls, communications, and digital logic design. Designed laboratory experiments for these courses. Conducted research evaluating error considerations and stability of nonlinear stochastic systems, and wrote technical papers on these topics.

Electrical Engineer at the Tennessee Valley Authority, November 1981 to August 1983. Performed portions of probabilistic risk assessments and reliability studies for TVA nuclear plants including Browns Ferry, Sequoyah, and Bellafonte, using fault trees and dedicated computer codes such as GO. Using GO, modeled and evaluated the reliability of the entire Browns Ferry electrical system.

Member of Technical Staff at AT& T, June 1980 to August 1981 (partly while attending Georgia Tech). Investigated the effects of sun transit time on communication satellites.

## **AREAS OF INTEREST:**

Sensor Data Fusion  
Automatic Target Recognition  
Control Using Neural Nets and Fuzzy Logic  
Application of Control Theory to Robotic Systems  
Probabilistic Risk Assessments and Reliability Studies  
Distributed Estimation  
Engineering Ethics  
Under-representation in STEM fields

### **EXTERNAL FUNDING AT UTC:**

Adaptive Methods Contract for \$31,786 awarded June 23, 2008 for sensor fusion for Navy Anti-Submarine Warfare. Subsequent funding totalling \$87,589 was added to the project since that time.

NSF Grant for \$99,806 awarded September 1, 2002 for BESTT planning grant.

NSF Grant for \$99,274 awarded January 1, 2001 for ACES program.

### **RESEARCH AND PROFESSIONAL ACTIVITIES:**

Principal Investigator of "Computer-aided Risk Analysis for Acute Coronary Syndromes in Chest Pain Patients," funded by the UTC internal Collaborative Research Initiative for Sponsored Projects (CRISP) for \$9,840, 2012-13.

Ethicist for the 2013-2013 National Science Foundation Research Experiences for Undergraduates program at UTC, 2012-13.

Principal Investigator of "Data Fusion Technology and USW-DSS Fusion Technology Assessment," funded by the US Navy Anti-Submarine program through Adaptive Methods, 2008-2009. Goals were development of metrics and independent assessment of fusion processes and technologies for the Undersea Warfare Decision Support System. Initial funding of \$31,786 was awarded June 12, 2008, followed by a second funding increment of \$19,489. Additional funding for fiscal year 2009 was \$68,100.

Principal Investigator of "Bridges to Engineering Science: Teaching Teachers," a National Science Foundation funded planning grant to "widen the pipeline" from K-12 to engineering, with special emphasis on under-represented groups, 2002 - 2003. NSF Grant for \$99,806 awarded September 1, 2002.

Directed "Adventures in Computers, Engineering, and Space," a National Science Foundation program to provide under-represented middle school students with hands-on experience in engineering, computer science, and space sciences, 2001-2002. NSF Grant for \$99,274 awarded January 1, 2001.

Conducted research on fusion of information using a biologically inspired fusion model, as a consultant to Accurate Automation Corporation, funded by U.S. Navy Space and Naval

Warfare Systems Command (SPAWAR), 2001-2003.

Technology in Teaching and Learning Faculty Fellow, UTC, 2000-2001.

NASA Research Contract--control of a flexible beam using neural networks and fuzzy logic, 1992.

NASA Summer Faculty Fellow--control of a flexible beam using anticipatory fuzzy logic, 1991.

Directed a National Science Foundation program to provide gifted high school students with hands-on experience in electrical, chemical, and civil engineering, 1990 to 1992.

NASA Summer Faculty Fellow--simulation of control systems using neural nets, 1990.

Johnson Research Center--worked to develop an intelligent, voice-controlled wheelchair capable of path planning and obstacle avoidance, 1989 to 1991.

Aero-Optic Center for Excellence--researched multiple-target tracking as related to in-flight missiles, 1989.

UAH research grant--worked on error bounds in distributed estimation and supervised a graduate student in computer simulation, 1989 to 1990.

## **SERVICE:**

Have served as reviewer for

- \* *International Journal of Multisensor Information Fusion*
- \* American Society for Engineering Education Southeastern Section Conference
- \* SPIE Aerosense Conference
- \* *AIAA Journal of Guidance, Control and Dynamics*
- \* *IEEE Transactions on Automatic Control*
- \* American Control Conference
- \* Conference on Decision and Control
- \* National Science Foundation Gender Equity and GK12 Programs
- \* *Reliability Engineering and System Safety*

ABET Engineering Accreditation Commissioner, 2013- present

ABET EAC PEV for Electrical and Computer Engineering programs since 1996

IEEE Committee on Global Accreditation Activities (CGAA), 2016-present

IEEE Committee on Engineering Accreditation Activities (CEAA) 2011-12

Chair of IEEE CEAA Accreditation Criteria Committee, 2012

Boardmember for ASEE Ethics Society, 2015-17

Boardmember for ASEE Women in Engineering Division 2013-15 and 2016-present

Served on General Education, Honor Court, Student Evaluation of Faculty Committee, UTC Academic Strategic Planning Committee, Undergraduate Curriculum Committee, Engineering

Graduate Committee, Handbook Committee, Program Task Force of the College of Engineering Strategic Plan Implementation, Provost Search Committee, Engineering and UTC Petitions Committees, and the Faculty Senate Committee on Committees. Chair of the UTC Grade Appeals Committee, 2010-2011.  
American Society for Engineering Education Southeastern Section, Electrical Engineering Division Chair, 2001-2002.  
American Society for Engineering Education Southeastern Section, Vice Chair for Research, 2002-2003.  
American Society for Engineering Education Southeastern Section, Chair for Research, 2003-2004.  
American Society for Engineering Education Southeastern Section, Chair for Awards, 2007-2008.  
American Society for Engineering Education Southeastern Section, Secretary of the Computer Engineering Division, 2008-2009.  
American Society for Engineering Education Southeastern Section, President-Elect, 2009-2010.  
American Society for Engineering Education Southeastern Section, President, 2009-2011.  
American Society for Engineering Education Southeastern Section, Vice Chair for Professional Skills Division, 2005-2016.  
Treasurer for the Chattanooga Chapter, Society of Women Engineers, 2015-16.  
Treasurer for the UTC Chapter of Sigma Xi, 2002-present.  
Member of UTC Faculty Senate, 2000-2002; 2003-2004; 2005-2009; 2011-2015.  
Second Vice Present of the UTC Faculty Senate, 2014-15.  
Chair of the UTC Faculty Handbook Committee, 2014-15.  
Faculty advisor for the UTC student IEEE chapter, 2000-2007.  
Project Lead The Way university affiliate professor, 2006-present.  
Served on Federal Women's Program committee at USASSDC, 1994-1999.  
Finance Chair for 1998 IEEE Conference on Decision and Control.  
Treasurer of the Huntsville branch of the IEEE, 1991- 1992.  
President of the Huntsville branch of the Society of Reliability Engineers, 1991-1992.  
Secretary of the Huntsville branch of the IEEE Controls Society, 1989-1992.  
Chairman of the Huntsville branch of the IEEE Aerospace and Electronics Society, 1990-91.  
Served on UAH Robotics Committee and Calendar Transition Committee, ECE Dept. Graduate Committee, Communications Committee, Undergraduate Committee, and Chairman Search Committee.

## **HONORS:**

Computer Science Department Best Teaching Award, 2016  
ASEE Southeastern Section Outstanding Conference Paper, 2012  
UTC College of Engineering and Computer Science Research Award, 2002  
Grants and Research Award, 2003  
Tau Beta Pi  
Eta Kappa Nu  
Sigma Xi

## NASA Technology Transfer Award

### **RESEARCH REPORTS:**

“Data Fusion Technology and USW-DSS Fusion Technology Assessment,” in addition to monthly progress reports, two major reports were submitted in February, 2008:

- *CDRL A003 - Metrics Assessment Report*
- *CDRL A004 – Literature Survey*

Space and Naval Warfare Systems Command (SPAWAR) ***BIOLOGICALLY INSPIRED PROCESSOR FOR ALL-SOURCE DATA ASSOCIATION AND FUSION (BIONIS)***

Contract N00039-01-C-2206 – Bi-Monthly Progress & Status Reports:

- "Possible Prediction of Target from Preceding Clutter," June 2003
- "SURTASS Classification Results," April 2003
- "Intelligent Processing of SURTASS Feature Data," February 2003
- "Proposed BIONIS LFA Sea Trial," December 2002.
- "Application of BIONIS to LFA Field Test Data," October 2002.
- "Acquisition and Evaluation of LFA Field Test Data," August 2002.
- "Feature Evaluation Tools," July 2002.
- "Evaluation of SPAWAR Lab-Created Data," April 2002.
- "Enhanced BIONIS to Emphasize Sensor Agreement," February 2002.
- "Acquisition and Decoding of Lab-Created Feature and Snippet Data," December 2001.
- "Completion of BIONIS Software Implementation," October 2001.
- "On-Going Development of BIONIS Software Implementation," September 2001.
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The final report for this project was completed in July 2003, and a patent application covering the work was submitted.

"Bridges to Engineering Science: Teaching Teachers," National Science Foundation Annual Report, August, 2003.

"Adventures in Engineering, Computers, and Space" National Science Foundation Final Report, June, 2003.

"Adventures in Engineering, Computers, and Space" National Science Foundation Annual Report, December, 2002.

"Adventures in Engineering, Computers, and Space" National Science Foundation Annual Report, December, 2001.

NASA Contract Final Report, "Flexible Body Control Using Neural Networks," March 1992.

NASA Summer Faculty Fellowship final report, "Control of a Flexible Beam Using Fuzzy Logic," August 1991.

UAH Research Report, Johnson Research Center, "Charger II: An Autonomous Robotic Vehicle," June 1991.

NASA Summer Faculty Fellowship final report, "Neural Networks as a Control Methodology," August 1990.

UAH research grant final report, "Validity of Stochastic Distributed Estimation as an Estimation Tool." June 1990.

UAH Research Report No. 90-23, Johnson Research Center, "Charger II Phase 2 Development," June 1990.

UAH Research Report No. 834, Johnson Research Center, "Charger II Phase 1 Development," December 1989.

### **PAPERS AND PRESENTATIONS:**

C. L. McCullough, S. Chesser, and B. Weathington, "Subtle and Not-So-Subtle Messages of Non-Inclusion," presented at the American Society for Engineering Education Zone II Conference, San Juan, Puerto Rico, March 2017.

C. L. McCullough, "An Evaluator's Perspective on Proposed Changes to ABET Criteria," presented at the American Society for Engineering Education Southeastern Section Conference, Tuscaloosa, AL, March 2016.

C. L. McCullough, "Problem Based Learning as a Tool in Addressing Gender Bias," presented at the American Society for Engineering Education Conference, Seattle, WA, June 2015.

C. L. McCullough, "How Does Presence of Women in Computer Fields Affect Perception of the Gender Gap?" presented at the American Society for Engineering Education Southeastern Section Conference, Gainesville, FL, April 2015.

C. L. McCullough, "Implicit Association Test as an Indicator of Gender Bias in Computer Fields," presented at the American Society for Engineering Education Southeastern Section Conference, Macon, GA, March 2014.

C. L. McCullough and Yu Cao, "Ethics and Biomedical Informatics: a Research Experiences for Undergraduates Program at the University of Tennessee at Chattanooga," presented at the American Society for Engineering Education Southeastern Section Conference, Cookeville, Tennessee, March 2013.

C. L. McCullough, "Ethics for the Information Age," presented at the American Society for Engineering Education Southeastern Section Conference, Starkville, Mississippi, April 2012.

Awarded Best Paper.

C. L. McCullough, "What Makes a College Graduate "Educated"? A Proposed Curriculum Revision Across Disciplines," presented at the American Society for Engineering Education Southeastern Section Conference, Charleston, South Carolina, April, 2011.

C. L. McCullough, "A Comedy of Errors: Teaching Oral Presentation Skills Using a Spectacularly Bad Presentation," presented at the American Society for Engineering Education Southeastern Section Conference, Blacksburg, Virginia, April, 2010.

R. Canavan, C. L. McCullough and W. Farrell III, "Track-Centric Metrics for Track Fusion Systems," presented at the 12th International Conference on Information Fusion, Seattle Washington, July 2009.

W. Farrell III, C. L. McCullough and R. Canavan, "Automated Metrics Assessment System for Track Fusion," presented at the presented at the SPIE Aerosense Conference, Orlando, FL, April 2009.

K. Winters and C. L. McCullough, "A Student-Designed Computer System to Aid ABET Assessment: Using One ABET Requirement to Fulfill Another," presented at the American Society of Engineering Education Southeastern Regional conference, Atlanta, GA, April 2009.

C. L. McCullough and P. Hoadley, "Information Literacy of Freshmen and Seniors at UTC and VMI," oral presentation, presented at the American Society of Engineering Education Southeastern Regional conference, Memphis, TN, April 2008.

C. L. McCullough, A. J. Novobilski, F. M. Fesmire, "Use of Neural Networks to Predict Adverse Outcomes from Acute Coronary Syndrome for Male and Female Patients," presented at the 2007 International Conference on Machine Learning and Applications, Cincinnati, Ohio, December 2007.

C. L. McCullough, " ABET EC 2000: How Has It Changed? Has It Accomplished What Was Intended " presented at the American Society for Engineering Education Southeastern Section Conference, Louisville, KY, April, 2007.

C. L. McCullough, A. J. Novobilski, F. M. Fesmire, "Prediction of adverse outcomes of Acute Coronary Syndrome using intelligent fusion of triage information with HUMINT," presented at the presented at the SPIE Aerosense Conference, Orlando, FL, April 2006.

C. L. McCullough, " Information Literacy: A Critical Component in Engineering Practice in the Twenty-First Century, " presented at the American Society for Engineering Education Southeastern Section Conference, Tuscaloosa, Alabama, April, 2006.

C. L. McCullough, "ABET Assessment: Is It Really as Difficult as It Seems?" presented at the American Society for Engineering Education Southeastern Section Conference, Chattanooga, TN, April, 2005.



C. L. McCullough, "Separating the Wheat from the Chaff in the Information Age," presented at the American Society for Engineering Education Southeastern Section Conference, Auburn, AL, April 2004.

C. L. McCullough, J. Bryson, R. Pap, J. Wilson, and J. Davis, "Biologically Inspired Classification and Target Prediction Using Low Frequency Active Sonar Sensor Features," presented at the Military Sensing Symposia National Symposium on Sensor and Data Fusion, San Diego, CA, June 2003.

C. L. McCullough, "If We Build It, Will They Come?: Attracting, and Retaining, Under-Represented Groups in Engineering," presented at 2003 American Society for Engineering Education Annual Conference & Exposition, Nashville, TN, June 2003.

C. L. McCullough, "Engineering the World: An Assignment to Measure the Elusive ABET f, h, and j," presented at the American Society of Engineering Education Southeastern Section Conference, Macon, GA, April 2003.

C. L. McCullough, J. Bryson, R. Pap, J. Wilson, and J. Davis, "Biologically Inspired Classification of Low Frequency Active Sonar Sensor Features for the Surveillance Towed Array Sonar System," presented at the Joint Undersea Warfare Technology Conference, Naval Postgraduate School, Monterey, CA, March 2003.

C. M. Wigal, N. Alp, C. L. McCullough, S. Smullen, and K. Winters, "ACES: Introducing Girls to, and Building Interest in, Engineering and Computer Science Careers," presented at the 32nd ASEE/IEEE Frontiers in Education Conference, Boston, MA, November 2002.

Organizer and moderator for a panel discussion on "Attracting and Retaining Under-Represented Groups to Engineering and Computer Science," American Society of Engineering Education Southeastern Section Conference, Gainesville, FL, April, 2002. (Invited)

C. L. McCullough, "Attracting Under-Represented Groups to Engineering and Computer Science," presented at the American Society of Engineering Education Southeastern Section Conference, Gainesville, FL, April 2002.

C. L. McCullough, Robert Pap, Richard Akita, and Jerry Wilson, "Biologically Inspired Fusion of Sonar Sensor Data," presented at the Military Sensing Symposia National Symposium on Sensor and Data Fusion, San Diego, CA, June 2001.

C. L. McCullough, Cecelia Wigal, Neslihan Alp, Kathy Winters, Tom Patty, and Julie Sanders, "ACES: Adventures in Computers, Engineering, and Space," presented at the American Society of Engineering Education Southeastern Section Conference, Charleston, S.C., April 2001.

C. L. McCullough, "Uses of Technology in Attracting and Retaining Under-Represented Groups," oral presentation at the Southeastern Regional Faculty and Instructional Development Consortium Annual Sharing Conference, Chattanooga, TN, March 2001.

M. E. Ulug and C. L. McCullough, "A Quantitative Metric For Comparison Of Night Vision Fusion Algorithms," presented at the SPIE Aerosense Conference, Orlando, FL, April 2000.

C. L. McCullough, "Data Level Fusion of Images from Disparate Sensors," presented at the Eurofusion Conference, Stratford-upon-Avon, U.K., October 1999.

M. E. Ulug and C. L. McCullough, "Feature and Data Level Fusion of Infrared and Visual Images," presented at the SPIE Aerosense Conference, Orlando, FL, April 1999.

B. V. Dasarathy and C. L. McCullough, "Intelligent Multi-Classifer Fusion for Decision Making in Ballistic Missile Defense Applications," presented at the 1998 IEEE Conference on Decision and Control, Tampa, FL, December 1998. (Invited)

M. E. Ulug and C. L. McCullough, "Fusion of Thermal and Vision Images," presented at the 1998 Conference on Artificial Neural Networks in Engineering (ANNIE98), St. Louis, MO, November 1998. Also appeared in *Intelligent Engineering Systems Through Artificial Neural Networks*, Vol. 8, ASME Press, New York, 1998. (Invited)

C. L. McCullough, "Efficacy of Intelligent Processing in Target Identification: a Case Study," presented at the Second International Conference on Non-Linear Problems in Aviation and Aerospace, Daytona Beach, FL, April 1998. (Invited)

Z. J. Geng and C. L. McCullough, "Missile Control Using Fuzzy CMAC Neural Networks," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 20, No. 3, May-June 1997.

C. L. McCullough, Kathy Byrd, Charles Bjork, and Belur Dasarathy, "Multi-Sensor Fusion for Ballistic Missile Defense Applications," presented at the SPIE Aerosense Conference, Orlando, FL, April 1997.

C. L. McCullough, Kathy Byrd, Charles Bjork, and Belur Dasarathy, "Fused Sensor Discrimination for Ballistic Missile Defense Applications," presented at the US/UK Data Fusion Workshop, London, U.K., March 1997. (Invited)

C. L. McCullough, Kathy Byrd, Hajin Kim, and Charles Bjork, "Interceptor Discrimination Fusion," presented at the AIAA Missile Sciences Conference, Monterey, CA, November 1996.

C. L. McCullough, B. V. Dasarathy, and P.C. Lindberg, "Multi-Level Sensor Fusion for Improved Target Discrimination," presented at the IEEE Conference on Decision and Control, Kobe, Japan, December 1996.

C. L. McCullough, "Laissez-Faire Anticipatory Fuzzy Control," presented at the IEEE Conference on Decision and Control, Kobe, Japan, December 1996.

P. C. Lindberg, B. V. Dasarathy, and C. L. McCullough, "Multi-Level Fusion

Exploitation," presented at the SPIE Aerosense Conference on Sensor Fusion, Orlando, FL, April 1996.

C. L. McCullough, "Universal Sensor Fusion Architecture," oral presentation at the BMDO Data Fusion Workshop, Washington, D.C., October, 1995. (Invited)

Z. J. Geng and C. L. McCullough, "Missile Control Using Fuzzy CMAC Neural Networks," presented at the AIAA Guidance, Navigation, and Control Conference, Baltimore, MD, 1995.

C. L. McCullough, "Real-Time Decision Making Using Intelligent Processing," oral presentation at the AIAA Space Conference, Huntsville, AL, September 1994. (Invited)

C. L. McCullough, "Anticipatory Neuro-Fuzzy Control," (condensed from NASA contract reports), *NASA Tech Briefs*, Vol. 18, No. 6, June 1994.

C. L. McCullough, "Neural Net Control vs. Anticipatory Fuzzy Control for a Flexible Beam: a Comparison," presented at the IEEE World Congress on Computational Intelligence, Orlando, FL, June 1994. (Invited)

C. L. McCullough, R. Reed, and I. Jaszlics, "An Artificial Neural Net Battle Management Aid for Ballistic Missile Defense," presented at the 19th Army Science Conference, Orlando, FL, June 1994.

C. L. McCullough, M. Crull, and D. Thomas, "**Adventures in Engineering**: a Unique Program to Attract Under-represented Groups to Engineering," *IEEE Transactions on Education*, Vol. 37, No. 1, February 1994.

C. L. McCullough, J. D. Birdwell, and S. Lenhart, "Stability of Distributed Estimators for Linear Stochastic Systems," *Optimal Control Applications and Methods*, Vol. 14, No. 3, July-September 1993.

C. L. McCullough, "Intelligent Controllers Which Can Adapt to Changing Environments: Anticipatory Neuro-Fuzzy Control," presented at the American Control Conference, San Francisco, CA, June 1993. (Invited)

C. L. McCullough, "Anticipatory Neuro-Fuzzy Control: a Powerful New Method for Real World Control," presented at the IEEE International Workshop on Neuro-Fuzzy Control, Muroran, Japan, March 1993. (Invited)

Invited Panelist in a discussion of "What is Beyond Single Layer Fuzzy Control?" Second International Workshop on Industrial Fuzzy Control and Intelligent Systems, College Station, TX, December 1992. (Invited)

C. L. McCullough, "Adaptive Control of Noisy Nonlinear Systems Using Neural Networks," presented at SimTec '92 International Simulation Technology Conference,

Houston, TX, November 1992.

C. L. McCullough, "A Neural Network Adaptive Controller for a Class of Nonlinear Systems," *Journal of the Franklin Institute*, Vol. 329, No. 5, September 1992.

C. L. McCullough, "Control of a Flexible Beam Using Anticipatory Fuzzy Logic," presented at the American Control Conference, Chicago, IL, June 1992.

C. L. McCullough, "An Anticipatory Fuzzy Logic Controller Utilizing Neural Net Prediction," *Simulation*, Vol. 58, No. 5, May 1992.

C. L. McCullough, "Two Methods of Control Using Neural Net Emulation," presented at WNN-92 International Conference on Neural Networks, Auburn, AL, February 1992.

C. L. McCullough and C. A. McCullough, "A Critical Analysis of Appendix R Modifications at the Browns Ferry Nuclear Plant," *Reliability Engineering and System Safety*, Vol. 33, January 1991.

M. O. Hofmann and C. L. McCullough, "A Knowledge-Based Reliability Analysis System," presented at the IEEE International Conference on Systems, Man, and Cybernetics, Los Angeles, CA., November 1990.

C. L. McCullough and C. A. McCullough, "Preventive Maintenance Based on Reliability Centered Maintenance Analysis as Applied to the Browns Ferry Nuclear Plant," *Power Engineering*, October 1990.

C. L. McCullough, and M. O. Hofmann, "An Expert System for Generation of Hardware Failure Equations," presented at the American Nuclear Society conference, Nashville, TN., June 1990.

C. L. McCullough and C. A. McCullough, "An Evaluation of the Browns Ferry Nuclear Plant Preventive Maintenance Program Based on Reliability Centered Maintenance Analysis," presented at Power-Gen '89, New Orleans, LA., December 1989.

Mark West and C. L. McCullough, "An Optimal Recursive Filter for the Attitude Determination of the Spacelab Instrument Pointing System," presented at the Conference on Decision and Control, Tampa, FL., December 1989.

C. L. McCullough, "Probability Density Update for a Distributed System Based on Unnormalized Local Densities in the Continuous-Discrete Case," presented at the Conference on Decision and Control, Tampa, FL., December 1989.

C. L. McCullough and C. A. McCullough, "A Data-Based Approach for Failure Cause Analysis as Applied to the Brown Ferry Nuclear Plant Preventive Maintenance Upgrade Program," presented at the Symposium on the Design of Mechanical Systems

in a Concurrent Engineering Atmosphere, University of Iowa, October 1989. (Invited)

C. L. McCullough, "Probability Density Update for a Distributed System Based on Unnormalized Local Densities," presented at the Southeastern Symposium on Systems Theory, Tallahassee, FL., March 1989.

C. L. McCullough and J. D. Birdwell, "Error Considerations in Distributed Estimation of Nonlinear Stochastic Systems," presented at IEEE ComCon, Baton Rouge, LA., October 1988.

C. L. McCullough, J. D. Birdwell, and S. M. Lenhart, "Necessary and Sufficient Conditions for Bounded Covariance in Linear Stochastic Systems," presented at the American Control Conference, Atlanta, GA., June 1988.

C. L. McCullough and J. D. Birdwell, "Stability of Estimators for Linear Systems," presented at IEEE Southeastcon, Knoxville, TN., April 1988. (Invited)

C. L. McCullough and J. D. Birdwell, "Sufficient Conditions for Bounded Covariance in Linear Stochastic Systems," presented at the 19th IEEE Southeastern Symposium on System Theory, Clemson, S.C., March 1987.