

PAMELA MCCAULEY BUSH, PH.D., C.P.E.

Education

Ph.D. May 1993, Industrial Engineering, University of Oklahoma

M.S. December 1990, Industrial Engineering, University of Oklahoma

B.S. May 1988, Industrial Engineering, University of Oklahoma

Certifications

Certified Professional Ergonomist (CPE), 2008

Professional Positions

UNIVERSITY OF CENTRAL FLORIDA, Orlando, FL. (May 1993-present)

Position: Professor & Director of the Ergonomics Laboratory, Industrial Engineering and Management Systems Department

Duties: Designed and led Faculty Development initiative for the College of Engineering and Computer Science. This includes developing a data collection process, coordinating with college leadership, interacting with faculty and to create a program that supports and aligns with the Dean's vision, goals of the CECS and the dynamic needs of the faculty.

Conduct research in the area of ergonomics, safety, and fuzzy set theory and artificial intelligence research particularly with applications to human factors. Industry Liaison for the *Human Engineering Committee* Industry Alliance that consists of local companies interested in addressing ergonomics and safety in the workplace. Teaching responsibilities include delivery and course development of undergraduate and graduate courses, advising students. Taught courses include ergonomics, safety, expert systems, statistics, fuzzy set theory and introduction to industrial engineering. Conduct research in human factors/ergonomics including identification and measurement of occupational risk factors. Extensive service roles include participation in professional organizations and public service throughout the university and community.

Address: 4000 Central Florida Blvd.
Orlando, FL 32816

BUSH ENTERPRISES/TECH-SOLUTIONS, INC., Orlando, FL (June 1, 1999 - 2012)

Position: Chief Technology Officer/President

Duties: Interface with corporate executives, government officials and senior military officers in obtaining funding, developing strategic vision, establishing collaborations and projects on behalf of Tech-Solutions.net, Inc. Management of twelve employees and oversight on research projects.

Address: 3662 Avalon Park Blvd. E
Suite 204
Orlando, FL 32828

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA. January 1998–July 1999

Position: Martin Luther King, Jr. Visiting Associate Professor of Aeronautics and Astronautics

Duties: Teaching, research and service evaluation of the human factors issues associated with information security. Research has opened the field of “Human Impact in Information Security”; developing methodologies for classification of risks, training, and automation to mitigate human factors risks associated with the field of information security.

Address: 77 Massachusetts Ave
Cambridge, Massachusetts 02142

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (May 1997 – August 1997)

Position: American Society of Engineering Education Research Fellow

Duties: Lead the effort to produce metrics and guidelines for a management development effort at Kennedy Space Center, NASA. The long-range objective was to produce a knowledge based system for offering guidance and management in career development.

Address: Kennedy Space Center, Florida

TEACHING**Courses**

<i>Semester</i>	<i>Course Number</i>	<i>Course Title</i>	<i>Credits</i>	<i>Class</i>	<i>Class size</i>	<i>Course Evaluation Summary (Q16)</i>
Fall 2005	EIN5248	Ergonomics	3	Graduate	31	53.33
Fall 2005	STA3032	Probability & Statistics for Engineers	3	Undergraduate	159	67.56
Spring 2005	EIN6249	Biomechanics	3	Graduate	9	Not available
Spring 2005	EIN4243	Human Engineering	3	Undergraduate	22	47.4
Summer 2006	EIN5108	Systems Engineering	3	Graduate	26	80.6
Fall 2006	EIN5248	Ergonomics	3	Graduate	26	75
Fall 2006	STA3032	Probability & Statistics for Engineers	3	Undergraduate	206	67.5
Spring 2007	EIN4243	Human Engineering	3	Undergraduate	30	72.9
Fall 2007	STA3032	Probability & Statistics for Engineers	3	Undergraduate	227	41.5

Fall 2007	EIN5248	Ergonomics	3	Graduate	17	40
Spring 2008	STA3032	Probability & Statistics for Engineers	3	Undergraduate	20	45
Spring 2008** Taught by my Ph.D. Student, Dr. Durrani under my direction	EIN4243	Human Engineering	3	Undergraduate	28	Not available
Fall 2008	EIN5248	Ergonomics	3	Graduate	17	76.7
Fall 2008	STA3032	Probability & Statistics for Engineers	3	Undergraduate	209	36

Spring 2011	EIN6279	Biomechanics	3	Undergraduate	15	
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Fall 2011	EIN5248	Ergonomics	3	Graduate	24	
Spring 2011	EIN	Work Physiology	3	Undergraduate	9	
Fall 2012	STA3032	Probability & Statistics for Engineers	3	Undergraduate		

M.S. and Ph.D. Research Supervised as Major Professor *

Ph.D. Graduates: *Dr. Bush ranks among the most productive IEMS and CECS faculty in the production of Ph.D. graduates; current position/employment of graduates listed in parentheses*

1. Wanda Holmes, Ph.D. (Entrepreneur)
 - a. A Retrospective Analysis and Field Study of Nanotechnology Related Ergonomics Risks in Industries Utilizing Nanomaterials, May 2012
2. Chandre Butler, Ph.D. (*Entrepreneur*)
 - Measures of Engagement and Immersion in Distributed Gaming Environments, April 2010
3. Sami Durrani, Ph.D. CPE (*Human Factors Researcher, QinetiQ North America*)
 - Human Error in Mobile Keyboard Device Usage Subject to Cognitive, Environmental, and Workload Stressors Present in Fully Activated Emergency Operations Centers, August 2009
4. Joylene Ware, Ph.D. (*Senior Engineer, NASA*)
 - A systematic analysis to identify, mitigate, quantify, and manage risk factors contributing to falls in NASA Ground Support Operations, August 2009
5. Rochelle Jones, Ph.D. (*Visiting Assistant Professor, Air Force Institute of Technology*)
 - “Physical Ergonomic and Mental Workload Factors in Mobile Learning Environments”, May 2009
6. Christopher Reid, Ph.D. (*Human Factors Engineer, U.S. Army Natick Soldier Systems Center, Natick Massachusetts*)
 - “A Model for Predicting Musculoskeletal Disorders of the Lower Extremities in the Aeronautics Industry”, May 2009
7. Tareq Ahram, Ph.D. (*Post Doctoral Researcher, University of Central Florida*)
 - “Information Retrieval Performance Enhancement Using the Average Standard Estimator and The Multi-Criteria Decision Weighted Set of Performance Measures”, December 2008.
8. Jeffrey L. Cornett, Ph.D., (*Managing Director, Institutional Research, Valencia Community College*)
 - “Drive-Based Modeling and Visualization of Crew Race Strategy and Performance”, December 2008.
9. Kristine Relvini, Ph.D. (*Deceased; previously Senior Engineer Boeing Company*)
 - The Development, Analysis & Application of a Multifactor, Quantifiable Confined Space Human Performance Model, completed Spring 2002
10. John A. Picciuto, Ph.D. (*Retired Colonel, US Army*)

- Development of a Comprehensive Quantitative Ergonomic Evaluation Methodology for Bio-Defense Weapon Systems, completed Spring 2002
- 11. Robert L. Claflin, Ph.D. (*Colonel, US Army*)
 - Motorcycle Rider Posture Prediction: The Prediction of Spinal Curvature As a Function of Anthropometrics and Point-of-Contact Chassis Design., completed Summer 2002
- 12. Deborah Carstens, Ph.D. (*Associate Professor, Florida Institute of Technology*)
 - Development of Human Factors Password Guidelines for Authentication with Passwords, completed Summer 2000
- 13. Rhonda Freeman, Ph.D. (*Senior Scientist, AutoTrader.com*)
 - Fuzzy Intelligent Agents as a Tool to Manage Uncertainty in Interactive Systems completed Summer 1998
- 14. Maged Malek, Ph.D. (*Associate Professor and Department Chair, University of North Florida*)
 - Constructability Assessment Using Fuzzy Logic Modeling, completed Fall 1996

Current Ph.D. Students

1. Shannon Wooden
Research Topic: Ergonomic Design for Physically Immersive Entertainment Games
2. Susan Gaines
Research Topic: Biomechanical Model of Risks in High Consequence Disaster Management for First Responders
3. Reza Kordestani
 - a. Research Topic: Human Factors in Disaster Management

M.S. Students

1. Mr. Mohammad Jeelani
 - The Development of a Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-Held communication Devices Used to Support Communication Flow in High Consequence Emergency Management, Spring 2011
2. Major Carla Joyner
 - “The Effects on Operator Performance and Workload when Gunnery and Robotic Control Tasks are Performed Concurrently”, Spring 2006
3. Mr. Mario Rodriguez (co-advised while serving on the faculty at MIT)
 - “Human Factors in Networked Information Systems: Does it Matter”, Fall 2000
4. Ms. Darcy Hagist Miller
 - “Development of a Methodology to Conduct Usability Evaluations for Hand Tools that May Reduce the Amount of Small Parts that are Dropped During Installation While Processing Space Flight Hardware”, Fall 2000

5. Ms. Julie Drexler
 - “Development and Application of a Model for Human Factors Test and Evaluation of Physical Systems in an Operational Environment”, Spring 2000
6. Ms. Johnine Mowatt
 - “An Analysis of Physical Task Assessment Techniques for Ergonomics Evaluations”, Spring 1998
7. Ms. Irene Liggon
 - “A Biomechanics Evaluation of Injuries incurred by Professional Ballet Dancers due to Pointe Work”, Summer 1997
8. Mr. Wang Heng
 - “Fuzzy Linear Regression Models for Cumulative Trauma Disorders of the Hand and Forearm in Office Environments”, Summer 1995

Teaching Emphasis

- Human Factors/Ergonomics
- Biomechanics
- Fuzzy Set Theory: Theoretical Foundations and Applications
- Expert Systems and other Artificial Intelligence Techniques
- Probability and Statistics for Engineers

Educational Contributions

Collaborations and Partnerships

- Interdisciplinary collaboration on Human Factors, Social Science in Disaster Management with Massey University, New Zealand (Fulbright proposal awarded for research collaboration in New Zealand, August 2012)
- *Chair, National Science Foundation funded workshop at the New University of Lisbon*, Lisbon Portugal; Human Factors, Sensor Technology and Logistics in Disaster Management. January 2012
- College of the Bahamas – Research and educational collaboration focused on human factors issues in disaster management. Activities include proposal development, joint research activities and student projects (2009-present).
- Human Engineering Committee – Served as the IEMS Department Industry Alliance Liaison for Boeing and Lockheed/Martin Corporation; organized numerous local organizations to address common ergonomics and safety problems in the Central Florida area. Eleven organizations were a part of the human engineering collaborators. These collaborations have resulted in three thesis topics, guest lectures from practicing engineers and site visits for an entire class of students (1999-2004).
- Armstrong Laboratories, Wright Patterson, AFB, Ohio. This collaboration provided an application of fuzzy techniques to human factors problems through sharing of data

and information. Collaboration produced a funded project and a conference proceeding. (1994-1996)

- Institute for Simulation and Training, University of Central Florida. A collaborative effort to apply fuzzy techniques to modeling the decision making process in target acquisition for military applications. Collaboration resulted in a funded project, conference proceeding, and referred journal article (1995-1997).

Course Development

- Work Physiology course and laboratory (graduate)
- Introduction to Fuzzy Set Theory in Industrial Engineering (graduate)
- Ergonomics Laboratory to supplement existing course (graduate)
- Biomechanics course and laboratory (graduate)
- Introduction to Industrial Engineering (undergraduate)
- Human Engineering course and laboratory (undergraduate)
- Introduction to Engineering (undergraduate)
- Introduction to Statistical Analysis with JMP (continuing education course for local industry)

Teaching Innovations

- Service Learning Projects (2009-2010); In keeping with the mission of UCF to provide service to the community, I have instituted service learning exercises in my classes. These exercises teach the application of statistics and human engineering while doing a community based project. The spring 2010 project consisted of two courses (STA3032 and EIN4243) engaged in community based engineering projects at the Zora Neale Hurston festival.
- As chair of the Human Factors Committee (1994-present), I developed a unique series of laboratories for each of the human engineering classes: EIN4243 (Human Engineering), EIN5248 (Ergonomics), Work Physiology and EIN6249 (Biomechanics). The labs were initially developed in 1994-'95, revised in the Spring 2004 semester and revised again in the Spring 2010. The material was being developed into a formal laboratory manual. These labs and all her course notes are made available to colleagues to promote consistency and the delivery of comprehensive and quality courses in all human engineering courses.
- Interactive Teaching Techniques. (2005-2006) This innovation consisted of the development of specific strategies to successfully teach statistic courses that consist of on-site students and remote interactive sites. The methodology involves creation of integrated lectures that require input from all sites for discussion of specific issues and solutions to problems. The result has been outstanding reviews from remote and in-class students as well as recognition from administration as “the model faculty member in teaching distance learning courses.”
- An Introduction to Engineering Course (1995-2003) was developed to target under-represented minority engineering students. This was a team teaching effort with two other faculty members. The course was designed to address the basic concerns that all entering engineering students have about college but also focuses on issues that the literature has indicated as stumbling blocks for minority students. The retention rate

for students after their first year in this program was approximately 87.5%. (taught from 1995 – 2003)

- A graduate level course in fuzzy set theory was developed to capitalize on the experiences and success of current research projects. The course provided theoretical foundations, development techniques, and research applications relevant to Industrial Engineering. As a result of the course, I published a chapter in the Handbook of Industrial and Systems Engineering (2006).

RESEARCH

Key words: *Ergonomics and Human Factors in Disaster Management, Fuzzy Set Theory, Fuzzy Modeling, Cumulative Trauma, Ergonomics & Biomechanics, Engineering Leadership*

Evidence of International Reputation:

U.S. Fulbright Scholar (*Fulbright Specialist Program Awardee*): *US-New Zealand Award, August 15, 2012. Human Engineering and Mobile Technology in High Consequence Emergency Management*

“The Fulbright Program is the flagship international educational exchange program sponsored by the U.S. government and is designed to “increase mutual understanding between the people of the United States and the people of other countries.”

International Invited Keynote Addresses

1. *ICSEM 2012 (2012 the 3rd International Conference on System Science, Engineering Design and Manufacturing Informatization), 20-21 October, 2012 Chengdu, China. Sponsor IEEE Chengdu Section*
2. *2011 International Joint Conference on Fuzzy Engineering and Intelligent Transportation, Xi’an, China. December 11, 2011*
3. *Invited keynote speaker for IEEE SOFA Conference in Budapest Hungary-Arad, Romania 2009*
4. *Keynote speaker – Portuguese Ergonomic Society Annual Meeting, Sponsor, Portuguese Ergonomic Society, 2000*

International collaborations

1. *Established international collaborations with Massey University in New Zealand in the area of Human Factors in Disaster Management, 2011-2012*
2. *Lead NSF funded international workshop on Human Factors in Disaster Management Collaboration with the New Universities of Lisbon, 2012*
3. *International collaborations with two Romanian Universities (has been going on for the last year) and I am PI on the upcoming NSF supported conference*
4. *International collaboration with the College of the Bahamas and this area has recently been funded under an NSF grant, 2009 – 2012*
5. *Women’s International Research in Engineering Summit (WIRES) II; selected to attend the WIRES I conference 2009 in Barcelona and as a result was invited to give an international keynote address at the IEEE Soft Computing Conference in Romania (2009) and WIRES II in Athens, 2013*

International Service

1. *Elected to serve as the US Representative on the International COST Research Committee on Critical Infrastructure, 2010 - present*
2. *Guest editor for special edition of the International Journal of Advanced Intelligent Paradigms, 2012*
3. *Principal Investigator on the NSF Women’s International Research in Engineering Summit (WIRES), 2010-2011*
4. *Member of Editorial Board for International Journal of Advanced Intelligent Paradigms (IJIAP)*
5. *Member of graduate committees for the New University of Lisbon, 2009*

List of Publications:

1) Refereed books and monographs

1. McCauley Bush, P., "Ergonomics: Foundational Principles, Applications and Technologies", Taylor & Francis, CRC Press (2011) 331 pages
2. McCauley Bush, P. Transforming your STEM Career through Leadership and Innovation: Inspiration and Strategies for Women, Elsevier Publishers, N,Y NY (*In Press for publication 12/1/2012*); **ISBN-10: 012396993X**
3. McCauley Bush, P. and Crumpton-Young, L., "Essentials of Engineering Leadership and Innovation", Taylor & Francis, CRC Press (Anticipated publication date: 5/1/2013)

2) Refereed chapters in edited books

1. Nunes, I. and McCauley Bush, P. Chapter 1: Work-Related Musculoskeletal Disorders Assessment and Prevention, Ergonomics – A Systems Approach, Edited by Isabel L. Nunes, April 2012, In Tech Publishers, pp. 1-30
2. McCauley Bush, P., S. Gaines, F. Gammoh and S. Wooden, Chapter 4: A Comparison of Software Tools for Occupational Biomechanics and Ergonomic Research, In Ergonomics – A Systems Approach, Edited by Isabel L. Nunes, *expected* April 2012, In Tech Publishers, pp. 65-118.
3. Butler, C., Jones, R., & McCauley-Bush, P. (2010). "Future Challenges of Mobile Learning in Web-based Instruction". In *Web-Based Engineering Education: Critical Design and Effective Tools*, edited by D. Russell and A. Haghi. Engineering Science Reference 2010 (*accepted for publication July 2009*)
4. McCauley-Bell, P., and Crumpton-Young, L (2006), "Introduction to Applications of Fuzzy Set Theory in Industrial Engineering", Chapter 25, *Handbook of Industrial and Systems Engineering*, CRC Press, San Diego, CA. pp. 25-1 to 25-21
5. McCauley-Bell, P., "Ergonomics in Virtual Reality, (2002)," *Handbook of Virtual Environments: Design, Implementation, and Applications*. Mahwah, NJ: Lawrence Erlbaum Associates, Edited by Kay Stanney pp. 807-826
6. McCauley-Bell, P., Crumpton-Young, L. and Badiru, A. (1999) "Techniques and Applications of Fuzzy Theory in Quantifying Risk Levels in Occupational Injuries and Illnesses," in *Fuzzy Theory Systems: Techniques and Applications*, Vol. 1, Cornelius Leondes, Editor, Academic Press, pp. 223-265.
7. Soh, T, Crumpton, L., and McCauley-Bell, P. (1996). The Use of Fuzzy Logic to Develop a Mathematical Model to Quantify Fatigue. *Advances in Occupational Ergonomics and Safety Vol. I*. pp. 123-128.

3) Refereed journal papers

Dr. Bush has publications in highly ranked journals including IEEE Journals (acceptance rate 25-35%), Fuzzy Sets & Systems (acceptance rate ~17%), Journal of Information Science (acceptance rate ~30%) and other well respected scientific periodicals.

1. Shi, F. and McCauley Bush, P. A Gaussian-mixed Fuzzy Clustering Model on Valence-Arousal-related fMRI Data - Set, *Acta Poly. H.*, Vol. 10, No. 8, pp. 85-104, 2013 (IF=0.588)
2. Rusnock, C. and McCauley Bush, P. "An Evaluation of Restaurant Noise Levels and Contributing Factors", *Journal of Occupational and Environmental Hygiene* Volume 9 Issue (6), 2012, pp. 108-113,
3. Soyler, A., Bull, M., Zhu, Y, Sharawi A. and McCauley Bush, P. "A research-based approach to simulation in disaster management", *International Journal of Advanced Intelligence Paradigms, Vol. 4, Issue 1- 2012, pp. 2-21 DOI: 10.1504/IJAIP.2012.046963*
4. McCauley-Bush, P., Jeelani, M., Gaines, S., Curling, L., Armbrister, P., Watlington, A., Major, R., Rolle, L. and Sarah C. "Assessment of communication needs for emergency management officials in high-consequence", *Journal of Emergency Management*, January/February 2012 pp. 15-25
5. Ahram, T., McCauley-Bush, P. and Karwowski, W., "Estimating intrinsic dimensionality using the multi-criteria decision weighted model and the average standard estimator." *Journal of Information Science* (2010), doi:10.1016/j.ins.2010.04.006
6. Reid, C.R., McCauley-Bush, P.M., Cummings, N., McMullin, D.L., Durrani, S.K., A "Review of Occupational Knee Disorders." *Journal of Occupational Rehabilitation*. Doi: 10.1007/s10926-010-9242-8. Pp489-501, 2010.
7. Reid, C.R., McCauley-Bush, P.M., Karwowski, W., Durrani, S.K. "Occupational Postural Activity and Lower Extremity Discomfort: A Review." *International, Journal of Industrial Ergonomics*, doi: 10.1016/j.ergon.2010.01.003. pp. 247-256, 2010
8. Crumpton-Young, L., McCauley-Bush, P. Rabelo, L., Menza, K., Ferreras, A. Rodriguez, B, Millan, A., Miranda, D. and Kelarestani, M. "Engineering Leadership Development Programs A Look at What is Needed and What is Being Done." *Journal of STEM Education: Research and Innovations, "Special Issues on Engineering Leadership"* Pamela McCauley Bush, Guest Editor, Volume 11, Issues 3 & 4. May 2010
9. Cornett, J. McCauley-Bush, P. and Cummings, N. "An 8-Factor Model for Evaluating Crew Race Performance." *International Journal of Sports Science and Engineering*, (2008) Volume 2 Number 3, September 2008 pp. 169-184
10. Carstsens, D., Malone, L. and McCauley-Bell, P. "Applying Chunking Theory in Organizational Password Guidelines." *Journal of Information, Information Technology, and Organizations* Volume 1, 2006 pp. 97-113
11. Kari Babski-Reeves Ph.D., Sabrina Williams, Ph.D., Tzer Nan Waters, M.S, Lesia L. Crumpton-Young, Ph.D., and Pamela McCauley-Bell, Ph.D. (2005). "A Model to Predict Accommodations Needed by Disabled Persons." *IEEE Transactions on Neural Systems & Rehabilitation Engineering* January 2005 pp. 292-301

12. Carstens, D., McCauley-Bell, P., Malone, L. and Demara, R., "Human Factors Issues in Information Security." *Journal of Informing Science*, Vol. 7, 2004 pp. 67-85
13. McCauley-Bell P. and Crumpton-Young, L. (2000). "A Fuzzy Linguistic Model for the Prediction of Carpal Tunnel Syndrome Risks in an Occupational Environment." *IBM Journal of Research and Development*, 44(5), pp. 759-770.
14. Sfeir, H., D. R. Reinhart, P. McCauley-Bell (1999) "An Evaluation of MSW Composition Study Bias Sources," *Air and Waste Management Association Journal*, 49: 174-185.
15. McCauley-Bell, P. (1999) "Intelligent Management Agent Characterization and Uncertainty With Fuzzy Set Theory: A Tool to Support Early Supplier Integration." *Journal of Intelligent Manufacturing*, Vol. 10, pp. 135-147.
16. McCauley-Bell, P., Crumpton L., and Wang H. "Measurement of Cumulative Trauma Disorder Risk in Clerical Tasks Using Fuzzy Linear Regression." *IEEE Transactions on Systems Man and Cybernetics*, Volume 29C Number 1, February 1999. pp. pp. 1-14.
17. McCauley-Bell, P.R. and Crumpton, L. "A Fuzzy Linguistic Model for the Prediction of Carpal Tunnel Syndrome Risks in an Occupational Environment." *Ergonomics* Vol. 40, No. 8 August, 1997 pp. 790-799.
18. McCauley-Bell, P. and Badiru, A. "Fuzzy Modeling and Analytic Hierarchy Processing to Quantify Risk Levels Associated with Occupational Injuries Part I: The Development of Fuzzy Linguistic Risk Levels." *IEEE Transactions on Fuzzy Systems*, May 1996. pp. pp. 124-131
19. McCauley-Bell, P and Wang, H., "Fuzzy Regression Analysis to Predict Risk of Occupational Injuries." *Fuzzy Sets and Systems*, *Fuzzy Sets and Systems*, Vol. 92/3, pp. 317-340, December, 1997.
20. McCauley-Bell, P. and Badiru, A. "Fuzzy Modeling and Analytic Hierarchy Processing as a Means to Quantify Risk Levels Associated with Occupational Injuries Part II: The Development of a Fuzzy Rule-Based Model for the Prediction of Injury." *IEEE Transactions on Fuzzy Systems*, May, 1996. V 4, n 2, p 132-138, May 1996.
21. McCauley-Bell, P., Reinhart, D. Sfeir, H. and Ryan, B. "The Development of a Methodology and Expert System for Municipal Solid Waste Composition Studies". *ASCE Practice Periodical of Hazardous, Toxic, and Radioactive, Waste*, May, 1997 Volume 1, Issue 4, pp. 158-163. October 1997.
22. Wang, H. and McCauley-Bell, P. "Fuzzy Clustering Analysis and Multifactorial Evaluation for Students' Imaginative Power in Physics Problem Solving." *Fuzzy Sets and Systems*, Vol. 78, 1996 pp. 95-105.

4) Guest Editor in Journals

1. McCauley Bush, P.

- *Special Issue on Fuzzy Computing and Intelligent Transportation*, Hindawi Publishing, publication June 2014
- 2. McCauley Bush, P.,
 - *Journal of Advanced Intelligent Paradigms*: “Special Issue on Research Based Approaches to Simulation in Disaster Management” Pamela McCauley Bush, Guest Editor, Volume 4, Issue 1-2012
- 3. McCauley Bush, P.,
 - *Journal of STEM Education: Research and Innovations*, “Special Issues on Engineering Leadership” Pamela McCauley Bush, Guest Editor, Volume 11, Issues 3 & 4. May 2010

5) Refereed publications in conference proceedings

Dr. Bush has served as an invited speaker and Keynote speaker at international IEEE conferences, Fuzzy Engineering and Intelligent Transportation (FEIT and, Human Factors & Ergonomics Society Annual Meetings; she has also received invitations to present research in Portugal, Romania, China and numerous other conferences including National Science Foundation supported workshops and the Portuguese Ergonomic Society Annual Meeting.

1. Banisakher, M., P. McCauley Bush, and F. Shi. Gaussian Shaped Fuzzy Similarity Inference for Semantic Cell: An Affective Computing in Valence-Arousal Space, Proceedings of 2013 Fifth International Conference on Intelligent Human-Machine Systems and Cybernetics, pp. 280-284, IEEE CPS, USA, 2013.
2. Banisakher, M., P. McCauley Bush, C. Geiger, and F. Shi. Improving map-based post-disaster management system using Gaussian multisource data fusion algorithm, Proceedings of 2013 Fourth International Conference on System Science, Engineering Design and Manufacturing Informatization (ICSEM 2013), pp. 214-219, IEEE, USA, 2013.
3. Bush, P., S. Gaines, A. Watlington, M. Jeelani, L. Curling, and P. Armbrister Chapter 52. The Development of a Device Selection Model for Wireless Computing Devices in High Consequence Emergency Management. Advances in Usability Evaluation Part I, Edited by Francisco Rebelo, CRC Press 2012 pp. 486-499.
4. McCauley Bush and Gaines, S., A Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-held Communication Devices Used to Support Communication Flow in High Consequence Emergency Management, HFES Europe 2011 pp. 9
5. Bush, Pamela McCauley, Bull, M., Soyler, A. Zhu, Y., Diaz, S. and Kanjanapongpaisal, P. “A research based approach to predictive simulation in disaster management.” *Proceedings - 2009 3rd International Workshop on Soft Computing Applications, SOFA 2009*, p 23-24, 2009,

6. Reid, C.R., Bush, P.M., Karwowski, W., McMullin, D.L. (2009). "The Need for a Lower Extremity Risk Assessment Model." (2009). *Proceedings of the Human Factors & Ergonomics Society 53rd Annual Meeting*, San Antonio, TX. pg. 887-891.
7. Durrani, S.K., McCauley-Bush, P.R., Pfeifer, P., Crawford, K., Sprehn, K., Monroe, R. "Methodology for Human Error Experimentation on Handheld QWERTY Communication Devices." *Proceedings of the Institute of Industrial Engineers Annual Conference and Industrial Engineering Research Conference, Miami, Florida, May 30-June 3, 2009*. Location on Proceedings CD: H:\IIE2009\Res741.html
8. Reid, C., Bush, P. M., and Karwowski, W. "A Methodology for Validating a Knee Risk Analysis Model." (2009), *Proceedings of the Institute of Industrial Engineers Annual Conference and Industrial Engineering Research Conference, Miami, Florida, May 30-June 3, 2009*. Location on Proceedings CD H:\IIE2009\Res935.html
9. McCauley-Bell, P. , Durrani, S. Jacobson, M. Hemphill, A., and Vaughn, S. "Human Factors and Ergonomic Issues in Large Scale Disaster Management." *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference, 2008*, p 1429-1432
10. McCauley-Bell, P., S. Durrani and L. Fantauzzi, "A Study on the Needs and Perceptions for Formal Engineering Leadership Programs." "*Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference*", Vancouver, Canada, May 17-21, 2008, CD-ROM., Location on Proceedings CD H:\IIE08\Res666.html
11. McCauley-Bell, P., K. Williams, S. Durrani, M. Jacobsen, A. Hemphill and S. Vaughn, "Disaster Management Information Exchange Mapping.", *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference*" Vancouver, Canada, May 17-21, 2008, CD-ROM. Location on Proceedings CD: H:\IIE08\Res668.html
12. Malala, John; Major, Anthony; Maunez-Cuadra, Jose; McCauley-Bell, P. "The Use of Rewards in Instructional Digital Games: An Application of Positive Reinforcement." published in online *Proceedings of Annual Conference of the International Academy of Business Disciplines, 2007*, pp. 1-7
13. Schubert, S. Meza, K. Rodriguez B. Sprehn, K. Crumpton-Young, L. McCauley-Bell, P. and Rabelo, L. "The Center for Engineering Leadership and Learning (CELL):Towards the Development of a National Model for Engineering Leadership.", 2007, *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference, (2007)* Location on Proceedings CD: H:\IIE07\Res604.html
14. Sharma, S, Millan, A. Lamia, C., Crumpton-Young, L., McCauley- Bell, P. *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference, (2007)* "Total Body Fatigue Estimator"; Location on Proceedings CD: H:\IIE07\Res605.html
15. Babski-Reeves, K. McCauley-Bell, P. and Bertmaring, I. "Thermographic assessment of the anterior deltoid during overhead static exertions." ,2006, *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference*; CD Paper # 1790, Location on Proceedings CD: H:\IIE06\Research\1790.pdf

16. Joyner, C., Chen, J. and McCauley-Bell, P. "Robotic Control in a Multitasking Environment." *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference*, Orlando, FL, May 2006., **WINNER BEST PAPER AWARD – HUMAN FACTORS**; 2006, CD Paper#: 1174 Location on Proceedings CD: H:\IIE06\Research\1774.pdf
17. Ferreras, Ana, Hampton, Edward, Williams, Kent, Crumpton-Young, Lesia, Rabelo, Luis, McCauley-Bell, Pamela and Furterer, Sandra "The Development of a Curriculum to Instill Engineering Leadership & Management Skills in Undergraduate Students." ASEE Annual Conference and Exposition, Conference Proceedings, 2006, ASEE Annual Conference and Exposition
18. McCauley-Bell, P. Relvini, K., "The Human Element Part of Confined Space Operations. *Proceedings of the Institute of Industrial Annual Conference and Industrial Engineering Research Conference*, Georgia, 2005, CD-ROM
19. "The Development of a Methodology to Categorize Usability Issues in Networked Information Systems", McCauley-Bell, P. R. and Crumpton-Young, L. *MANUTECH International Conference*, 2004, Port Harcourt, Nigeria, CD-ROM
20. Mortimer, C. and McCauley-Bush, P. "An Ergonomic Analysis of Scale Pits." *Human Factors and Ergonomics Society Annual Meeting Proceedings*, 2002, pp. 1232-1236(5)
21. Carstens, D., McCauley-Bell, P. Malone, L. "Development of a Model for Determining the Impact of Password Authentication Practices on Information Security" *Proceedings of the XIVth Triennial Congress of the International Ergonomics Association and 44th Annual Meeting of the Human Factors and Ergonomics Association, 'Ergonomics for the New Millennium'*, 2000, p 342-345
22. Carstens, D. and McCauley-Bell, P. "The Importance of Human Error on Logistics Information Systems." *Society of Logistics Engineers Annual Conference*, February 2000, Orlando, FL, CD-ROM
23. McCauley-Bell, P. R. and Crumpton, L. (1998) "The Human Factors Issues in Information Security: What are They and Do They Matter?" *Proceedings of the Human Factors and Ergonomics Society 42nd Annual Meeting*, pp. 439-442.
24. McCauley-Bell, P. "A Holistic Paradigm for Evaluating the Role of Humans in the Security of Networked Information Systems." *Sandia National Laboratories High Consequence Conference*, November 11 - 14, 1999, CD-ROM
25. McCauley-Bell, P., Walters, M. and Waltensperger, G. "Human Factors Needs and Requirements in High Consequence Biological Agent Detection Systems." *Sandia National Laboratories High Consequence Conference*, November 11 - 14, 1999, CD-ROM
26. McCauley-Bell, P., Carstens, D., Wilson, T. and Grimsley, E. "Development of a Model for Deterring the Impact of Password Authentication on Information Security." *World Automation Conference, Maui, Hawaii* , 2000, CD-ROM

27. McCauley-Bell, P. and Malek, M. "The Quantification of the Safety Criteria in the Construction Industry." to be published in the *Proceedings of the Annual Industry, Engineering, and Management Systems Conference*, Cocoa Beach, FL, 1997, CD-ROM
28. McCauley-Bell, P. and Freeman, R. "Uncertainty management in Information Warfare." *Proceedings of the IEEE International Conference on Systems, Man and Cybernetics*, 1997, v 2, p 1942-1947
29. McCauley-Bell, P. and Stuckey, L. "An Ergonomics Test Tool - An Integration of Current Techniques." *Proceedings of the ISCA 9th International Conference* December, 11-13, 1996, Orlando, FL , pp. 36-40,
30. Cisneros, J., Clark, K., McCauley-Bell, P. and Rajput, S. "Threat Analysis using Fuzzy Set Theory". *Proceedings of the Sixth Conference on Computer Generated Forces and Behavioral Representation*, July 23-25, 1996, Orlando, FL. pp. 455-461.,
31. McCauley-Bell, P. and Freeman, R. "Quantification of Belief and Knowledge Systems in Information Warfare." *Proceedings of the Fifth IEEE International Conference on Fuzzy Systems*. New Orleans, LA , 1996, pp. 1579-1585
32. McCauley-Bell, P. and Freeman, R. "Fuzzy logic as a modeling development tool in computer generated forces for use in distributed interactive simulation." *Proceedings of the International Fuzzy Systems and Intelligent Control Conference*, 1996, Maui, Hawaii pp. 323-331
33. McCauley-Bell, P. "Quantification of various types of natural language imprecision: An algorithm for multiple attribute risk evaluation." *Proceedings of the International Fuzzy Systems Association World Congress*, Sao Paulo, Brazil, 1995, pp. 125 - 132,
34. McCauley-Bell, P. and Freeman, R. "Qualitative and quantitative indices for simulation systems in distributed interactive simulation." *Proceedings of the International Symposium on Uncertainty Modeling Analysis Annual Conference and the North American Fuzzy Information Processing Society*, 1995, pp. 745-748
35. McCauley-Bell, Pamela and Freeman, R. "Fidelity differences among interactive simulators." *Proceedings of the Semi-Annual DIS Workshop*, September, Orlando, FL, 1995 pp. 171-174,
36. McCauley-Bell, P. "Evaluation of the differentials in Distributed Interactive Simulation Environments." *Proceedings of the North American Fuzzy Information Processing Society (NAFIPS) Conference*, September, 1995. College Park, MD.
37. McCauley-Bell, P. and Freeman, R., "A theoretical basis for linguistic variables in fidelity definition for distributive interactive simulation." *The DIS Standards Workshop*, Orlando, FL 1995, pp. 965-970,
38. McCauley-Bell, P., Mowatt, J., Sutton, C., Crumpton, L, and Killough, M. (1995). "Fuzzy Set Theory and Natural Language in Cumulative Trauma Disorder Evaluation for Construction Workers." *Proceedings of the Second Industrial Engineering and Management Systems Research Conference*. pp. 214-218.

39. Heileman, M. and McCauley-Bell, P. "Ergonomic considerations in launch vehicle design and processing for operational efficiency." *Thirty-First Space Congress Research*, Cocoa Beach, FL, CD-ROM
40. McCauley-Bell, P. and Heng, W. "Development of Human Factors Criteria for Screen Usability." *Proceedings of the IEMS '94 Conference*, pp. 221-226, March 14-16, 1994, Cocoa Beach, FL.
41. Oser, R. and McCauley-Bell, P. "Alarm Systems in Modern Aircraft: Ergonomic and Human Performance Issues." *Proceedings of the IEMS '94 Conference*, pp. 203-208, March 14-16, 1994, Cocoa Beach, FL.
42. McCauley-Bell, P. and Badiru, A. "Concept Mapping as a Knowledge Acquisition Tool in the Development of a Fuzzy Rule-Based Expert System." *Proceedings of the Computers and Industrial Engineering Conference*, Vol. 25, No. 1-4, pp. 115-118, 1993.
43. McCauley-Bell, P. and Badiru, A., "A Fuzzy Linguistic Model for Job Related Injury Risk Assessment." *Proceedings of the Computers and Industrial Engineering Conference*. Vol. 23, pp. 209-212, 1992.
44. Purswell, J., McCauley, P. and Merrick, C. "Job Related Physical Performance Tests for Firefighters." *Advances in Industrial Ergonomics and Safety III*, pp. 577-581, 1991.

6) Publication in Conference/Workshop/Symposia without proceedings (for example, abstracts only)

1. McCauley Bush, P. "A Human Centered Methodology for the Development of a Fuzzy Model to Assess Mobile Communication Devices in High Consequence Emergency Management", 2011 International Joint Conference on Fuzzy Engineering and Intelligent Transportation, Xi'an, China. December 11, 2011 – **International**
2. McCauley Bush, P. "A Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-held Communication Devices Used to Support Communication Flow in High Consequence Emergency Management", HFES Europe Chapter Meeting, Leeds, UK, October 19-21, 2011 pp. 9 – **International**
3. McCauley Bush, P., M. Jeelani, S. Gaines, L. Curling, P. Armbrister, A. Watlington, R. Major, L. Rolle and S. Cohen. "A Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-Held Communication Devices Used to Support Communication Flow in High Consequence Emergency Management", International Research Committee on Disasters Research Meeting, Natural Hazards Annual Workshop, Broomfield, Colorado. July 2011 – **International**
4. McCauley Bush, P. and S. Gaines, "Bahamian Emergency Management Officials Utilizing Wireless Technology", International Research Committee on Disasters Research Meeting, Natural Hazards Annual Workshop, Broomfield, Colorado. July 2011 – **International**

7) Non-refereed publications and non-referred conference proceedings

1. McCauley-Bell, P., Demara, R., and Costas, C. The Development of Autonomous Agents for Supporting virus protection tools in a large corporate network. Lockheed Martin, Enterprise Information Systems, Orlando, FL and Lockheed Martin Corporate Information Security Division, Bethesda, MD. (May, 1999)
2. McCauley-Bell, P. and Freeman, R. Uncertainty Management in Evidence Accrual for Information Warfare. Prepared for Logicon Technical Services, Incorporated, Wright-Patterson Air Force Base, OH., January 1997
3. Karr, C., Cisneros, J. and McCauley-Bell, P. Target Analysis and Threat Analysis using Fuzzy Set Theory. Prepared for the U.S. Army, STRICOM, Orlando, Florida. November, 1995.
4. Reinhart, D. McCauley-Bell, P. Ryan, B. and Sfeir, H. Municipal Solid Waste Composition Studies. Prepared for the Department of Environmental Protection, Tallahassee, Florida November, 1995.
5. Ragusa, J., McCauley-Bell, P. and Brill, R. September, 1995 A Survey and Analysis of Group Decision Making Activities at the Kennedy Space Center. Prepared for NASA, Kennedy Space Center, Florida.

Select Invited Presentations:

1. Keynote Speaker: Women's International Research in Engineering Summit, September 12 – 14, 2012 Athens, Greece (*confirmed Keynote speaker*)
2. Keynote Speaker, 2011 International Joint Conference on Fuzzy Engineering & Intelligent Transportation, Xi'an, China, December 10-11, 2011
Presentation title: A Human Centered Methodology for the Development of a Fuzzy Model to Assess Mobile Communication Devices in High Consequence Emergency Management
3. Plenary Speaker; IEEE SOFA 2009. "A research based approach to predictive simulation in disaster management". 3rd International Workshop on Soft Computing Applications, Romania-Szed Arad, SOFA 2009
4. Keynote Speaker: "Ergonomics and Legislation in America" - Keynote Speaker, Portuguese Ergonomic Society International Conference: Ergonomics and Quality, Lisbon, Portugal April, 2000
5. Plenary Speaker: McCauley-Bell, P. "Fuzzy Applications in Uncertainty for Computer Generated Forces" Proceedings of the SOUTHCON Technical Conference, June 1996, Orlando, FL.
6. McCauley Bush, P. "A Human Centered Methodology for the Development of a Fuzzy Model to Assess Mobile Communication Devices in High Consequence Emergency Management", 2011 International Joint Conference on Fuzzy Engineering and Intelligent Transportation, Xi'an, China. December 11, 2011 – *International*

7. McCauley Bush, P. “A Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-held Communication Devices Used to Support Communication Flow in High Consequence Emergency Management”, HFES Europe Chapter Meeting, Leeds, UK, October 19-21, 2011 pp. 9 – ***International***
8. McCauley Bush, P., M. Jeelani, S. Gaines, L. Curling, P. Armbrister, A. Watlington, R. Major, L. Rolle and S. Cohen. “A Human Centered Methodology for the Identification of Communication Needs and the Assessment of Hand-Held Communication Devices Used to Support Communication Flow in High Consequence Emergency Management”, International Research Committee on Disasters Research Meeting, Natural Hazards Annual Workshop, Broomfield, Colorado. July 2011 – ***International***
9. McCauley Bush, P. and S. Gaines, “Bahamian Emergency Management Officials Utilizing Wireless Technology”, International Research Committee on Disasters Research Meeting, Natural Hazards Annual Workshop, Broomfield, Colorado. July 2011 – ***International***

Service Related Publications

- McCauley-Bell, P. “An Engineering Challenge: Expanding our Territory as Engineers”, *Florida Engineering Society Journal*, May 2003, p. 17-18

Grants and Contracts:

I have been active in proposal submission throughout my career. I have been awarded grants and contracts serving as Principal Investigator (PI) or Co-PI on research projects from prestigious funding agencies such as the National Science Foundation, Department of Defense and the National Aeronautics and Space Administration (NASA).

External Research Funded

1. **National Science Foundation, Principal Investigator, Principal Investigator, (\$35,884)** (8/13/2012 – 7/31/2013) EAGER: Initiation of a US-New Zealand Human Factors in Disaster Management Research Collaboration. Establishing guidelines for ergonomically sound task performance in emergency management response, along with establishing communication protocols has the potential to be revolutionary in transforming the approach for responding to human needs in catastrophic events. Using efficient and safe methods for first responders, including maximizing communication resources during relief efforts, as well as significantly impacting the quality of aid rendered and communication will be outcomes of the research.
2. **National Science Foundation, Principal Investigator, (\$17,646) - Phase II.** (7/2011 – 8/2012) “A human centered assessment of wireless computing devices in high consequence emergency management environments”. This research will establish a baseline and human factors centered principles for applications and use of wireless communication devices (Blackberry's, iPhones, etc.) in high consequence emergency management environments such as hurricanes, terrorist's attacks and activities of a comparable impact.
3. **National Science Foundation, Principal Investigator, (\$88,230) - Phase I.** (7/2010 – 6/2011) “A human centered assessment of wireless computing devices in high consequence emergency management environments”. This research will establish a baseline and human factors centered principles for applications and use of wireless communication devices (Blackberry's, iPhones, etc.) in high consequence emergency management environments such as hurricanes, terrorist's attacks and activities of a comparable impact.
4. **National Science Foundation, Principal Investigator, (\$111,142.00), (9/2010-8/2011)** (Collaborative proposal with Georgia Institute of Technology - total project funding \$223,142). Women's International Research Exchange (WIRES) is an international summit for female researchers seeking global collaborative opportunities in energy systems, micro/nanotechnology, disaster management research and simulation-based engineering. Promoting leadership in the establishment of international collaborations for female faculty in engineering and technology.
5. **Environmental Research and Education Foundation, Principal Investigator, (\$180,271), (7/2010 –12/2011)** “Ergonomic Study of Solid Waste Collection”. This project will examine the critical physical ergonomic issues associated with waste collection at various levels of automation, collect empirical data and establish environmentally and ergonomically sound industry guidelines for national and international application.
6. **National Science Foundation, Co-Principal Investigator, (\$49,635) (9/2010 –10/2012).** A Workshop to Review Pedagogical Practices in Engineering Leadership education. This research is an extension of a previous NSF funded project that established a baseline of needed research in engineering education including a demonstrated need for a review of pedagogical practices in engineering leadership education. The results will be used to provide substantive guidance on the effectiveness of various educational techniques in accomplishing specific objectives required in engineering leadership education.

7. **National Science Foundation, Principal Investigator, (\$6,635)** (8/2009-7/2010) (Romanian & I-COST Committee Travel Grant). Funding to support Dr. Bush's election to the International Committee on Science and Technology on Critical Infrastructure and the establishment of a collaboration between the US and Romania for human factors in disaster management research.
8. **National Science Foundation, Principal Investigator, (\$126,896)** (5/2007 – 7/2009). Human Factors in Disaster Management Research initiative. Human Factors in Disaster Management Research initiative was funded to address the hurricane season and capture ephemeral data that would be used to define the research gaps and emerging related physical ergonomics, communications and cognitive demands in emergency management.
9. **National Science Foundation, (\$103,219) Co-Principal Investigator,** (7/2007-8/2008). Engineering Leadership in Reengineering the Undergraduate Industrial Engineering Program. A study to determine the foundational principles associated with educating students in engineering leadership. Lead to the development of the Center for Engineering Leadership and Learning (CELL).
10. **National Aeronautical and Space Administration Human Factors Symposium (\$6,000) Principal Investigator,** (7/03-8/04). This international meeting was to bring professionals together from all over the world to discuss current issues, emerging trends, current methodologies and best practices for human factors and ergonomic issues in space.
11. **National Aeronautical and Space Administration, (\$166,418) Co-Principal Investigator, (2/2000-12/2000).** Investigation of Risk Management Methodologies, Techniques and Tools: A project, the purpose of which is to investigate risk management methodologies suitable for application in a human mission spaceport operational environment.
12. **National Aeronautical and Space Administration, (\$4,000) Co-Principal Investigator, Co-Principal Investigator.** (2/2000-12/2000). Development of Crew Restraints System for Long Duration Task. This project funded a student project that was guided by Dr. Bush to teach ergonomic students how to apply ergonomic design. The goal was to research and design ergonomically sound crew restraint systems for astronauts on the International Space Station. This was a national competition between UCF students and five other universities. The UCF student design won this national competition and the developed design is on display at NASA Johnson Space Center.
13. **National Security Agency, (\$110,380) Joint project with the Florida Agricultural and Mechanical University (FAMU) and Florida State University (FSU) College of Engineering, (\$313,096 total project budget) – Phase I** (5/99 - 5/02) Project developed a neuro-fuzzy approach for the detection of anomalous activities in distributed computer systems. Project developed a prototype internet-connected file server to demonstrate the effectiveness of a distributed, neuro-fuzzy defensive information operation (DIO) paradigm for detecting anomalous computer activities.
14. **National Security Agency (\$27,002) Joint project with the Florida Agricultural and Mechanical University (FAMU) and Florida State University (FSU) College of Engineering- Phase II** (5/2000 - 5/2001) Project developed a neuro-fuzzy approach for the detection of anomalous activities in distributed computer systems. Project developed a prototype internet-connected file server to demonstrate the effectiveness of a distributed, neuro-fuzzy defensive information operation (DIO) paradigm for detecting anomalous computer activities.

15. **National Security Agency (\$10,000) Joint project with the Florida Agricultural and Mechanical University (FAMU) and Florida State University (FSU) College of Engineering- Phase III** (5/2000 - 5/2001) Project developed a neuro-fuzzy approach for the detection of anomalous activities in distributed computer systems. Project developed a prototype internet-connected file server to demonstrate the effectiveness of a distributed, neuro-fuzzy defensive information operation (DIO) paradigm for detecting anomalous computer activities.
16. **Lockheed Martin Company, Principal Investigator (\$35,000), Enterprise Information Systems, Orlando, FL. and Corporate Information Security Department, Bethesda, MD.,** (9/98 – 8/99). This project was tasked with developing a multiple agent system (MAS) of passive and active intelligent agents to monitor and interact with existing systems within a network. The MAS searches for attempts to exploit known system vulnerabilities. The MAS will be a multi-level hierarchy designed to detect and monitor ports while the agent code responds to trigger events and initiates a response.
17. **National Science Foundation, Principal Investigator, POWRE Grant (\$50,000)** (1/98 – 12/98). Elephant: Development & Analysis of an Intelligent Tool to Mitigate Risks of User Overload in Authentication. This research evaluated the human side of information security; this research has initiated the field of “Human Impact in Information Security”.
18. **Defense Information Systems Agency, Principal Investigator, (\$39,476)** - This project was designed to develop a methodology for creating generic fuzzy agents that engage in dialog and coordinate transfer of information. This project has applied a technique developed through the interaction with Wright-Patterson AFB, Human Factors laboratory for managing uncertainty in information through the use of fuzzy set theory (8/1996 -4/1997).
19. **Marion County Principal Investigator (\$14,983)** Co-Principal Investigator. This project was designed as an environmental and industrial engineering study to evaluate an expert system-based methodology for performing municipal solid waste composition studies. A successful expert system was designed and validated.
20. **Hinkley Florida Center for Solid and Hazardous Waste Management, Principal Investigator, (30,964).** (4/1995-12/1995) Development for an Expert System to Facilitate Municipal Solid Waste Composition Studies and associated data collection, management and analysis -- Phase II.
21. **National Science Foundation, (\$18,000),** Principal Investigator, (8/1994 - 1/996). “Development of a methodology for fuzzy modeling of human performance” This project involves the evaluation of the use of fuzzy set theory (FST) as a modeling tool in identifying and modeling the primary elements that are necessary to describe human performance. FST will also be used to evaluate the feasibility of linguistic hedges in human computer interaction
22. **Simulation Training Instrumentation Command (STRICOM) (\$8,000) – Principal Investigator,** (project conducted with the UCF Institute for Simulation and Training). Fuzzy Set theory in Computer Generated Forces - Researcher. This project evaluated the use of fuzzy set theory in addressing the uncertainty associated with decision making, dynamic obstacle avoidance, and target prioritization in computer generated forces.

23. **Hinkley Florida Center for Solid and Hazardous Waste Management - Co-Principal Investigator. (\$50,581)** (4/1995-12/1995) "Municipal Solid Waste Composition Study -- Phase I, Development of a systems approach to Municipal Solid Waste Composition Studies and associated data collection, management and analysis"
24. **National Aeronautical and Space Administration (NASA), (\$120,000), Co-Principal Investigator.** EPSS Research & Applications" - This research involved the evaluation of the current methodologies used for imagery in engineering applications at Kennedy Space Center (4/1994-4/1995).

Internal Funding

UCF - EIES - (\$11,000) University of Central Florida sponsored research. Research was a study and analysis to evaluate the use of Fuzzy Set Theory in Multi-Criteria Decision Making Analysis (May, 1993).

University of Central Florida - Principal Investigator Expert Advisor: Participated in research in the development of a knowledge based system for academic advisement. Will attempt to utilize fuzzy set theory to improve the user interface (August, 1993).

PROFESSIONAL ACTIVITIES

Dr. Bush has consistently participated in service activities at the university, community, national and international level. She serves on international editorial boards and in 2009 was elected to serve on an international committees related to disaster management. Numerous service activities are in the areas of my research in ergonomics, disaster management and leadership. She continually engages in activities to promote the study of engineering, innovation, opportunities for underrepresented groups and leadership in the global society for responsible engineering.

Service to the Department, College and University

Department

- Chair, Assistant Department Chair Search Committee – 2004
- Chair, Undergraduate Recruitment Committee, 2003 – ‘04
- Chair, Human Engineering Committee, 1999-2007

College

- Minority Engineering Program Committee Chair 1997-2004
- Faculty advisor to the National Society of Black Engineers, 2000-2009
- Co-Faculty Advisor to the Society of Women Engineers, 2008-present

University

- Search Committee Member: Vice Provost of Information Technology, 1994-‘95
- President (Co-President with Dr. P. Delfyett), Black Faculty and Staff Assembly 1998-1999

Service to the Profession

International

- **United States Representative**, (elected December 2009 - present) - International Committee on Science and Technology (COST) for Critical Infrastructure (Management Committee Member) (2009- present)
- **Program Committee**, *International IEEE Systems Man and Cybernetics Conference*, Orlando, FL 2005,
- **International Conference Committee Member**, MANUTECH International Engineering Conference (2004-2005)
- **Vice-Chair**: IEEE Computer Society Standards Activities Committee, Virtual Intelligence: P1423 Recommended Practice for Terminology - Definition of Terms for Fuzzy Systems (1996- 1997)
- **Vice-Chair**, IEEE Computer Society Standards Activities Committee, Virtual Intelligence: P1440 Guide for the Definition and Specification of Fuzzy Systems in Applications and their Interfaces with other Elements of Computational Intelligence (CI) of the System (1996 - 1997)

National Level

- **Board member**, National Center for Simulation (NCS) 2004- 2007.
- **Board member**, *Women of Color in Technology Conference & Alumni Association*, 2004 - present
- **Chair**, *NASA/UCF Human Factors Tools & Research in Space Symposium*, 2004

- **Board Member**, Women in Engineering Program Advocates Network (WEPAN), 1999 – 2002
- **Conference Co-Chair, WEPAN National Conference**, 2002, San Juan Puerto Rico
- **Conference Planning Committee**: International Industry Engineering and Management Systems Conference 1994

State and Regional

- **Board Member**, Florida Research Consortium, 2001-2004

Local

- **Science Advisory Council Member**: Orlando Science Center, 1995
- **Board Member** – CITE Lighthouse for the Blind, Orlando, FL, 2005

Editor, Associate Editor or Member of Editorial Board

1. **Member of Editorial Board**, International Journal of Advanced Intelligent Paradigms, 2009 - present
2. **Associate Editor**, of Industrial and Systems Engineering, CRC Press, 2006 Handbook
3. **Member of Editorial Board**, Theoretical Issues in Ergonomics Science 1999-2003

Consulting Activities

- 1999-2012** Bush Enterprises/Tech Solutions, Inc. – Ergonomics and biomechanics focused technical support services and technical product development.
- 1993-2012** Expert Witnessing in the areas of product liability, biomechanics, ergonomics, human engineering, biomechanics, occupational safety
- 1999** Kirtland Air Force Base, NM.
- 1998** Provided technical guidance for TASC/Litton, Inc. in the development of intelligent systems for information warfare
- 1996** Wright-Patterson Air Force Base, Dayton, Ohio. Development of a model for management of uncertainty in information processing for aircraft personnel.

Professional License and Certifications

- Certified Professional Ergonomist, 2008 - present

External professional Service (school boards, industry boards, National Science Foundation (NSF) panels, etc.) that are related to the mission of the university

- **National Science Foundation Annual Reviewer** –Engineering Research Center Review Panel (2006-2011);
 - **Center for Compact and Efficient Fluid Power (CCEFP)**
- **National Science Foundation Panelist** - 2007, 2004, 1999, 1995, 1993
- **Board Member**, Blue Ribbon Panel Orange County Public Schools - designed to evaluate and develop recommendations for public education in Orange County, FL Public Schools
- **Board Member**, BETA Teen Parent program, Orlando, FL, 1994-2004
- **Board Member**, Central Florida YMCA, 1994

Other Activities related to the mission of the university

Mentoring Activities

- UCF Graduate Student Summer Mentoring Program (2006, 2007, 2008, 2011)
- Mentor in UCF RAMP Program 2010 – '12: Mentor to female undergraduate engineering students
- Mentor in UCF EXCEL Program 2010 – '12: Mentor to female undergraduate engineering students
- Ronald McNair Undergraduate Research Program Mentor & Speaker
- Mentor to ten minority and/or female graduate students at UCF and nationwide (ongoing) 1993 – 2012
- Official UCF mentor to two Kennedy Space Center NASA Scholars:
- Over 50% of my undergraduate mentees/protégés have obtained graduate degrees in engineering

RECOGNITION AND AWARDS

Teaching Related Recognition and Awards

1. Distinguished Engineering Educator of the Year – Central Florida Chapter of the Society of Women Engineers, 2003
2. IIE Solutions: *Infinite Possibilities* – (cover story), December 2002
3. Teaching Incentive Program (TIP) Award Winner, December, 1997
4. UCF College of Engineering, Excellence in Undergraduate Teaching Award, 1997

Research Related Recognition, Appointments and Awards

1. Fulbright Specialist Award, **U.S. Fulbright Scholar Program** (Fulbright Specialist Award for New Zealand, August 2012)
2. Presidents Research Advisory Board -**College of the Bahamas**, Nassau, Bahamas, 8/2010 - present
3. United States Representative to the **International COST Research Committee**, 2009 - present
4. Distinguished Alumni Association Inductee, 2009, **University of Oklahoma College of Engineering**
5. Engineer of the Year, **Florida Engineering Society, Technology Category**, 2007
6. Best Paper Award **Industrial Engineering Research Conference**, 2006
7. **Air Force Research Laboratory** Invited Speaker, 2002
8. International Guest Lecture Series, **Portuguese Ergonomics Society**, Lisbon, Portugal, 1998
9. Faculty Fellowship, NASA, **American Society of Engineering Education (ASEE)**, 1997

Service Related Recognition and Awards

1. University of Oklahoma College of Engineering Distinguished Graduate Society, 2009
2. Woman of Distinction in Technology, Central Florida Girl Scout Council, 2006
3. University of Oklahoma, Distinguished Alumni Award, 2004
4. Rising Star Award, Women's Diversity Council, Washington, D.C. , 2004
5. Summit Award, Orlando Florida, 2001
6. Millennium Woman of the Year Award, 2001
7. Saturn-Glamour Magazine "Women Making a Difference Award", 2000
8. Outstanding Woman of Color in Technology: Educational Leadership, 1999
9. Publishers Award: Women Looking Award, Atlanta GA, 1998
10. Nations 50 Top Women in Science and Engineering, National Technical Association, 1997
11. Finalist - NASA Space Shuttle Astronaut Program, 1994