Mahmoud A. Manzoul
Summary of Accomplishments

General Higher Education Experience:
- Tenured Full Professor of Electrical and Computer Engineering with extensive experience in teaching, research, and administration in higher education including being a 2019 Fulbright Scholar and a member of Lane Academy Distinguished Alumni of West Virginia University

Administrative Experience: Founding Chair of the Department
- Hired eleven faculty members, recruited more than 400 students, developed seven teaching laboratories, and two research centers. Led the development of BS in Computer Engineering (2003), BS in Telecommunications Engineering (2003), BS in Electrical Engineering (2012), BS in Biomedical Engineering (2014), MS in Engineering (2004), and Ph.D. in Engineering (2014)
- The Computer Engineering BS was ranked 3rd nationally in graduating African Americans in 2016 by IPEDS.
- The Computer Engineering BS was ranked among the top 100 most affordable Computer Engineering programs in the nation by University HQ, 2021.
- Secured $500,000 donation from Entergy Inc. to establish Entergy Power Systems Laboratory and scholarships for the Electrical Engineering program.

ABET Accreditation Experience
- Program Evaluator for the Engineering Accreditation Commission (EAC) of ABET since 2008. I evaluate Computer Engineering and Electrical Engineering programs.
- I served on eleven ABET accreditation teams on domestic and international visits.
- Led the Department in securing the ABET accreditation for the BS in Computer Engineering program, BS in Electrical Engineering, and BS in Telecommunication Engineering program.

Research Experience
- Published 24 journal articles, two book chapters, and above fifty conference papers.
- More than 20 research grants/contracts from different agencies such as NSF, USAID, and DoD (more than $7M). Served on several National Science Foundation review panels.
- The Department had two research centers: Centre for Defense Integrated Data (Army Space and Missile Defense Command) and Northrop Grumman HPC Center (Northrop Grumman)

Teaching Experience
- Taught a variety of undergraduate and graduate courses in Electrical and Computer Engineering.
- Extensive experience in course and curricula development
- Developed several teaching laboratories

Special Awards
- 2019 Fulbright Scholar to Sudan
- Member of Lane Academy of Distinguished Alumni, West Virginia University (2008)
- Innovative Research Award, 2005/2006, Jackson State University

MAHMOUD A. MANZOUL

Current position: Professor of Electrical and Computer Engineering

Office address: Department of Electrical & Computer Engineering and Computer Science
Jackson State University
PO Box 17098
Jackson, Mississippi 39217, USA
Office phone (601) 979 2105 or (601) 979 3921
E-mail: mahmoud.a.manzoul@jsums.edu

RESEARCH INTERESTS:

Engineering Education, Digital System, VLSI Design, Embedded Systems, Fuzzy Logic, Computer Architecture.

EDUCATION

Ph.D.   West Virginia University, Morgantown, WV, 1982-1985
M.S.E.E.   West Virginia University, Morgantown
B.S.E.E.   University of Khartoum, Sudan 1977

ROFESSIONAL EXPERIENCE

- July 2022 to present, Professor of Electrical and Computer Engineering
- July 2018 to June 2022, Chair and Professor, Department of Electrical & Computer Engineering and Computer Science.
- July 2017 to July 2018, Professor of Electrical and Computer Engineering
- July 2001 to June 2017, Chair and Professor, Department of Electrical and Computer Engineering, Jackson State University. Led the development of BS in Computer Engineering, BS in Telecommunications Engineering, BS in Electrical Engineering, BS in Biomedical Engineering, and Ph.D. in Engineering degrees. Secured ABET accreditation for undergraduate degrees.
- May 1991 to June 2001; Associate Professor of Electrical and Computer Engineering (tenured), Southern Illinois University at Carbondale, Duties include teaching graduate and undergraduate courses, conducting research, and supervision of dissertations and theses.
- September 1999 to August 2000, Associate Professor, School of Engineering, American University of Sharjah, United Arab Emirates (leave of absence).
- September 1997 to July 1998, Chair, Department of Electrical Engineering, United Arab Emirates University (sabbatical leave).
- September 1996 to September 1997, Associate Professor of Electrical Engineering, United Arab Emirates University (leave of absence).

- August 1985 to May 1991; Assistant Professor of Electrical Engineering, Southern Illinois University at Carbondale. Duties include teaching graduate and undergraduate courses and conducting research in the area of Computer Engineering.

Special Awards:

- 2019 Fulbright Scholar to Sudan
- Lane Academy of Distinguished Alumni, West Virginia University (2008)
- Innovative Research Award, 2005/2006, Jackson State University

PROFESSIONAL ORGANIZATIONS

1. The Institute of Electrical and Electronic Engineers (IEEE), Senior Member.
2. National Society of Black Engineers (NSBE).
3. The Electrical and Computer Engineering Department Heads Association (ECEDHA).

TEACHING

I. Teaching Areas

I have taught graduate and undergraduate courses in the following areas: Computer Architecture; Logic Design; Microprocessor Based Design; Switching and Finite Automata Theory; Fault Tolerant Digital Systems; Computer Aided Design of Digital VLSI Systems; Testing of Digital Systems, and Electric Circuits.

II. Curriculum/Courses development

Southern Illinois University:
> ECE 424 Microprocessor Based Design
> ECE 427 Structure of Computers
> ECE 527 Switching Circuit Theory
> ECE 425 Computer Aided Design of Digital VLSI Systems I

Jackson State University: Developed the curricula for the following degrees:
> BS in Computer Engineering
> BS in Telecommunications Engineering
> BS in Electrical Engineering
> BS in Biomedical Engineering
> Ph.D. in Engineering

RESEARCH

I. Research Grants/Contracts:

1. M.A. Manzoul, (subcontract) from Industrial Assessment Center of Mississippi State University, Department of Energy, $200,000, January 1st, 2022, to December 31, 2025.
2. M.A. Manzoul (Activity Director), Fostering Undergraduate Talent by Unlocking Online Engineering Laboratory Resources, Title III, Department of Education, $97,000 per year, 2021-2025
3. M.A. Manzoul and Sudha Yerramilli, Development of the Sensor Environment Imaging (SENSEI) Instrument, NSF, $275,000 subcontract from University of Illinois at Chicago, October 2014 to September 2017.
4. M.A. Manzoul and A.A. Eldek, Experimental Centric Based Engineering Curriculum for HBCU, NSF (subcontract from Howard University), $240,000, September 2013 to August 2016
5. K.S. Ali, A.A. Eldek, and M.M. Manzoul, MRI (Development): Hardware in the Loop Simulator for Unmanned Aerial Vehicles, NSF, $305K, January 1, 2011 to December 31, 2012.
6. M.A. Manzoul and A. Eldek, Broadband Antennas and Antenna Arrays for Wireless Communications, Clarkson Aerospace, $80K, October 1, 2010 to November 30, 2011.
7. M.A. Manzoul and A. Eldek, Actively Tunable Metamaterials, Lockheed Martin Aeronautics, $100K, September 1, 2010 to December 1, 2010. Office, ISP02-127; 2002/2003.
8. M.A. Manzoul and A. Eldek: Sensor Research: Reconfigurable Antennas, Clarkson Aerospace, $100K, October 1, 2009 to November 1, 2010.
9. M.A. Manzoul, K. Abed, K. Ali, and W. Blair, TIG: Establishment of New Electrical Engineering Program at Jackson State University, NSF $140,000, September 15, 2008 to August 31, 2010.
10. M. Manzoul, K. Abed, T. Ghirmai and H-R. Shih, "Establishment of FPGA-Based Design Laboratory," DoD Infrastructure Support Program for HBCU/MIs., $273,181. From 8/1/07 to 7/31/08.
11. M.A. Manzoul, Alliance between Historically Black Universities and Research Universities for Collaborative Education and Research in Computing Disciplines, NSF, $99,000 from 3/1/2006 to 2/28/2009.
12. R. Whalin, M.A. Manzoul, Vertical Integration for Missile Defense Surveillance Data, US Army Space and Missile Defense Command, amount $2.34 million ($ 1.09 million was funded on July 15, 2004 and the remaining 1.25 was funded in March 2005).
13. M. A. Manzoul, Visualization of Computer Networks, Part of the High Performance Computers and Visualization Initiative, Army. Amount $300K from July 15, 2004 to December, 2006.
14. M. A. Manzoul, "Multi-Disciplinary/Multi-Component Data Exchange Specification," PET Program, $50,000 June 1, 2004 to May 31, 2005.
15. M. A. Manzoul, "Mesh Improvement Algorithms and Software Technology," PET program, $15,000 June 1, 2004 to May 31, 2005
16. Felix Okojie and M.A. Manzoul, Higher Education and Development in Iraq; US Agency for International Development (USAID) Grant number RAN-A-00-03-00100-00, amount $4.9 million, 11/20/2003 to 11/30/2004.

17. Matching Grant, Sun Microsystems, UNIX Based Computing Laboratory $92,650.00, November 2002.
18. Unix-Based Computing Laboratory, $138,000; Department of Defense – Army Research
19. Equipment Donation, Xilinx Inc, ($51,994), November 2001
20. LCA (FPGA) Based Multi-Variable Fuzzy Control Systems; Principal Investigator; Sponsor: National Science Foundation; $69,982; Grant No. MIP-9011478; June 1990 to November 1992.
21. Development of a Microprocessor Laboratory; Principal Investigator; Teaching Fellowship; Sponsor: Office of Vice President for Academic Affairs and Research, Southern Illinois University; Summer 1988.
22. Fast Carry Look-Ahead Binary Adder Circuit; Principal Investigator; Sponsor: ORDA Southern Illinois University; August 1987 to May 1989.

PUBLICATIONS

JOURNAL PUBLICATIONS

1. A. Eldek, and M. Manzoul "Enriching Electrical and Computer Engineering Education Using Virtual Labs", Transaction on Techniques in STEM Education, Volume 1, No. 4, 2016, pp 69-78.
2. A. Eldek, A. Abdallah, and M. Manzoul, "Reconfigurable Microstrip Double-Dipole Antennas for Personal Wireless Communications," Wireless Engineering and Technology (WET), vol. 2, no. 2, Apr., 2011
3. M.A. Manzoul, "Multi-function Protective Relay on FPGA," Microelectronics and Reliability, Volume 38, 1998, pp.1963-1968
4. J. Moore and M. A. Manzoul, "An Interactive Fuzzy CAD Tool," IEEE Micro, April 1996, pp.68-74.
5. Valavala Krishna Rao S. V. and M. A. Manzoul, "A Fuzzy Partitioning System," IEEE Micro, December 1995, pp. 66. The complete article is on Micro www site: http://www.computer.org/pubs/micro/web/web.htm
6. M.A. Manzoul and D. Jayabharathi, "FPGA for Fuzzy Controllers," IEEE Transactions on Systems, Man, and Cybernetics, Volume 25, No. 1, 1995, pp. 213-216
7. M.A. Manzoul P. Modali, "Overcurrent Relay on a FPGA Chip," Microelectronics and Reliability, Volume 35, No. 7, 1995, pp. 1017-1022
8. M.A. Manzoul and D. Jayabharathi, "CAD Tool for Implementation of Fuzzy Controllers on FPGAs," International Journal of Cybernetics and Systems Volume 25, 1994, pp. 599-609
9. Hossain and M.A. Manzoul, "Hardware Implementation of Fuzzy Replacement Algorithm for Cache Memories Using Field Programmable Gate Arrays," International Journal of Cybernetics and Systems, Volume 24, 1993, pp. 81-90
10. Rathish Jayabharathi and M.A. Manzoul, "Fuzzy Logic for Standard Cell Placement," International Journal of Cybernetics and Systems, Volume 24, 1993, pp. 197-215
11. S. Hiremath and M.A. Manzoul, "An Improved Fuzzy Replacement Algorithm," International Journal of Cybernetics and Systems, Volume 24, 1993, pp. 325-339.

12. M.A. Manzoul and M. Suliman, "Fault-Tolerant Microprocessor-Based Overcurrent Relays," Microelectronics and Reliability, Volume 31, Number 1, 1991, pp. 133-139.
13. M.A. Manzoul, "Interrupt-Driven Microprocessor-Based Overcurrent Relay," IEEE Transactions on Industrial Electronics, Volume 38, Number 1, 1991, pp. 8-9
14. M. Suliman and M.A. Manzoul, "Neural Network Realization of Markov Reliability and Fault-Tolerance Models," Microelectronics and Reliability, Volume 31, Number 1, 1991, pp. 141-147
15. A. Noore, H. Nariman, M.A. Manzoul, "Design of Reconfigurable Fault-Tolerant VLSI/WSI Processor Array Structures," Microelectronics and Reliability, Volume 31, Number 2/3, 1991, pp. 481-489
16. C.A. Goben, M. Suliman, M.A. Manzoul, "TMR Neural Simulation," Microelectronics and Reliability, Volume 31, Number 2/3, 1991, pp. 375-380.
17. A. Hossain, A.R. Marudarajan, and M.A. Manzoul, "Fuzzy Replacement Algorithm for Cache Memory," International Journal of Cybernetics and Systems, Volume 22, 1991, pp. 733-746
18. M.A. Manzoul and S. Tayal, "Systolic VLSI Array for Multi-variable Fuzzy Control Systems," International Journal of Cybernetics and Systems, Volume 21, Number 1, 1990, pp. 27-42
19. M.A. Manzoul and M. Suliman, "Neural Network for the Reliability Analysis of Simplex Systems," Microelectronics and Reliability, Volume 30, Number 4, 1990, pp. 795-800
20. M.A. Manzoul and M. Suliman, "Reliability Analysis of TMR Systems on Neural Network," Microelectronics and Reliability, Volume 30, Number 4, 1990, pp. 801-806
21. M.A. Manzoul, "Multiple Overcurrent Relays Using a Single Microprocessor," IEEE Transactions on Industrial Electronics, Volume 37, Number 4, August 1990, pp. 307-309
22. M.A. Manzoul, "Faults in Fuzzy Logic Systolic Arrays," International Journal of Cybernetics and Systems, Volume 21, Number 4, 1990, pp. 511-522
23. M. Suliman and M.A. Manzoul, "Neural Networks Applied to Reliability Analysis of Fault-Tolerant Hardware," International Journal of Cybernetics and Systems, Volume 21, Number 6, 1990, pp. 629-640

CHAPTERS IN BOOKS

- M.A. Manzoul, "Fuzzy Management of Cache Memories," Chapter 25 in Fuzzy Control Systems, A. Kandel and G. Langholz Editors, Boca Raton, Florida: CRC Press, 1994, pp. 541-550.
- M.A. Manzoul, "Fuzzy Controllers on Semi-Custom VLSI Chips," Chapter 26 in Fuzzy Control Systems, A. Kandel and G. Langholz Editors, Boca Raton, Florida: CRC Press, 1994, pp. 551-560.

CONFERENCES (Selected)

1. Ahmed A. A. Elhag, Mohammed I. A. M.Osman, Nihad A. A. Elhag, and Mahmoud A. Manzoul, "Sensor-Based Obstacle Avoidance for Autonomous Mobile Robots:

Experimental Study," International Conference on Automation, Robotics and Applications (ICARA 2021), February 4-6, 2021, Prague, Czech Republic, pp 26-31.

2. Moayad ELamin, Fay Elhassan, and Mahmoud A. Manzoul, "Comparison of Deep Reinforcement Learning Algorithms in Enhancing Energy Trading in Microgrids," 2020 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), Khartoum.

3. Moayad ELamin, Fay Elhassan, and Mahmoud A. Manzoul, "Enhancing Energy Trading Between Different Islanded Microgrids A Reinforcement Learning Algorithm Case Study in Northern Kordofan State," 2020 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), Khartoum.

4. Fay Elhassan, Moayad ELamin, and Mahmoud A. Manzoul, "An Economic Evaluation of Islanded Microgrids Implementation in Northern Kordofan State," 2020 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), Khartoum.

5. Eldek and M.A. Manzoul, "Towards Online Teaching of Electrical and Computer Engineering Laboratories," 2015 Mississippi Academy of Science meeting.

6. Eldek, A. Abdallah, and M.A. Manzoul, "MEMs Applications for Reconfigurable Antennas for Wireless Data Sensing," IEEE National Aerospace & Electronics Conference, Dayton, OH, July 20-21, 2010.

7. M.A. Manzoul and T. Ghirmai, Effective Assessment Process, Best assessment Processes IX Symposium, April 12-14, 2007, Terre Haute, IN.

8. M.A. Manzoul and T. Ghirmai, Assessment of the Computer Engineering Program Outcomes Using EPAN Vector, 3rd International Conference On Computer Science & Information Systems July 23-26, 2007, Athens, Greece.

9. Chia-Pin R. Liu, Shaofeng Yang, and M.A. Manzoul, "Traffic Monitoring for a Network Visualization Environment," ISCA 21st International Conference on Computers and Their Applications, March 23-25, 2006, Seattle, Washington.

10. M.A. Manzoul, "Minimization of Finite State Machines using Spreadsheet," ISCA 15th International Conference of Computer Application in Industry and Engineering, San Diego, 2002.

11. M.A. Manzoul, "Addition with Three Parallel CLA Circuits," Proceedings of the ISCA14th International Conference on Computer Applications in Industry and Engineering, Las Vegas, Nevada, 2001, pp 1-4.

12. M.A. Manzoul, "Embedded Computing Systems: Hands-on Approach," Proceedings of the ISCA14th International Conference on Computer Applications in Industry and Engineering, Las Vegas, Nevada, 2001, pp 272-275.

13. M.A. Manzoul and S. Padmanaban, "VHDL Modeling of Overcurrent Relays," ISCA 13th International Conference on Computer Applications in Industry and Engineering, Hawaii, November 1-3, 2000.

14. M.A. Manzoul and R.E. Swartwout, "Multiple-valued carry look-ahead addition using CCD circuits," Proceedings 29th Midwest Symposium on Circuits and Systems, 1986.pp. 777-780.

15. M.A. Manzoul and V.B. Rao, "Fuzzy power factor correction,"   Proceedings 15th ACM Computer Science Conference, February 1987.

16. M.A. Manzoul, "Quaternary complex number CCD adder," Proceedings 15th ACM Computer Science Conference, February 1987.

17. M.A. Manzoul and J.-Y. Han, "Realization of a multi-valued inner product step processor," Proceedings 15th ACM Computer Science Conference, February 1987.
18. M.A. Manzoul, "Fuzzy inference on a systolic array," Proceedings 18th Modeling and Simulation Conference, Pittsburgh, April 1987, pp. 1103-1108.
19. M.A. Manzoul and M. Ashraf, "Binary addition via a MV-CCD carry look-ahead circuit," Proceedings 17th International Symposium on Multiple-Valued Logic, May 1987, pp. 210-214.
20. M.A. Manzoul and V.B. Rao, "Multi-input fuzzy inference engine on a systolic array," Proceedings 1st International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems, June 1988.
21. K.S. Ali, I.E.. Hajjar, and M.A. Manzoul, "A procedure to introduce microprocessors," Proceedings 31st Midwest Symposium on Circuits and Systems, 1988, pp. 1023-1026.
22. M.A. Manzoul, A. Bommireddy, and K.S. Ali "On the design of fast adder circuits," Proceedings 31st Midwest Symposium on Circuits and Systems, 1988, pp. 1183-1185.
23. M.A. Manzoul and K.S. Sripadam, "Concurrent error-detection in fuzzy systolic arrays," Proceedings 31st Midwest symposium on Circuits and Systems, 1988, pp. 980-983.
24. M.A. Manzoul and H.A. Serrate, "Fuzzy systolic arrays," Proceedings 18th International Symposium on Multiple-Valued Logic, May 1988, pp. 106-112.
25. M.A. Manzoul and H.A. Serrate, "Systolic VLSI arrays for fuzzy logic in expert systems," Proceedings 16th ACM Computer Science Conference, February 1988, pp. 380-383.
26. M.A. Manzoul and A. Bommireddy, "Fast 8-bit adder with two parallel carry look-ahead circuits," Proceedings 2nd Parallel Processing Symposium, April 1988, pp. 88-94.
27. M.A. Manzoul and A. Bommireddy, "Quaternary logic for carry look-ahead binary addition," Proceedings 18th International Symposium on Multiple-Valued Logic, May 1988, pp. 294-299.
28. M.A. Manzoul and K.S. Sripadam, "Fault-tolerant systolic array for single-input single-output fuzzy logic controllers," Proceedings 1989 American Control Conference.
29. M.A. Manzoul, "PLA implementation of fuzzy controllers," Proceedings IASTED International Conference on Applied Simulation and Modeling, 1989, pp.164-166.
30. M.A. Manzoul, S. Moorthy, and R.E. Swartwout, "An improved m-valued carry look-ahead adder," Proceedings 19th Symposium on Multiple-Valued Logic, May, 1989, pp. 280-282.
31. M. Suliman and M.A. Manzoul, "Reliability of fault-tolerant hardware using neural networks," Proceedings IASTED International Conference on Applied Simulation and Modeling, 1989, pp. 106-108.
32. M.A. Manzoul and D. Jayabharathi, "On the design of fault-tolerant systolic array for fuzzy logic,"Proceedings of Electro International, New York, 1991, pp. 482-485.
33. M.A. Manzoul and P. Modali, "ASIC for Overcurrent Relays," Proceedings 23rd North American Power Symposium, 1991, pp. 296-303.
34. M.A. Manzoul and D. Jayabharathi, "Implementation of fuzzy controllers using combinational circuits", Proceedings North American Fuzzy Information Processing Society Workshop, 1991, pp. 163-167.
35. A. Hossain, A.R. Marudarajan, and M.A. Manzoul, "Fuzzy controller for cache memory management", Proceedings North American Fuzzy Information Processing Society Workshop, 1991, pp. 393-397.

36. M.A. Manzoul and D. Jayabharathi, "Logic synthesis of fuzzy controllers", Proceedings International Fuzzy Systems and Intelligent Control Conference, 1992, pp. 1-7.

Graduate Students Supervised:

- 1. Mohammed Ashraf, M.S., Thesis: Realization of 4-Valued Adder Circuits Using CCD's, December 1986.
- 2. Venkateshwar B. Rao, M.S., Thesis: Multi-Input Fuzzy Inference on a Systolic Array, August 1987.
- 3. Hoverth A. Serrate, M.S., Thesis: On the Mapping of Fuzzy Inference Algorithms onto Systolic Arrays, December 1987.
- 4. Amalkiran Bommiredddy, M.S., Thesis: Fast Radix-m CLA Addition Via (m)-Valued Logic, May 1988.
- 5. Kumar S. Sripadam, M.S., Thesis: Fault-Tolerant Consideration in Fuzzy Systolic Arrays, May 1989.
- 6. Sanjaya Tayal, M.S. Thesis: ROM Based Fuzzy Systems, August 1990.
- 7. Ashfaq Hossain, M.S. Thesis: Fuzzy Controller for Cache Memory Management, May 1991.
- 8. Prasad Modali, M.S. Thesis: Overcurrent Relays on Field Programmable Gate Arrays, December 1991.
- 9. Dinesh Jayabharathi, M.S. Thesis: Implementation of Fuzzy Controllers Using Field Programmable Gate Arrays, January 1992.
- 10. Rathish Jayabharathi, M.S. Thesis: A Standard Cell Placement Strategy Using Fuzzy Logic, August 1992.
- 11. Beheshteh Hajmahmoudsayeh, M.S. Thesis: Obstacle Avoidance and Motion Control of Robot Using Fuzzy Logic, January 1994.
- 12. Eskinder Shemilis, M.S. thesis: Target-Seeking and Obstacle-Avoidance Using Fuzzy Logic, May 1994.
- 13. Krishna Valavla, M.S. Thesis: Clustering Based VLSI Partitioning Using Fuzzy Logic, April 1995.
- 14. Iyadurai Desikan, M.S. Thesis: Application of Fuzzy Logic in Isolated word Recognition, June 1996.
- 15 Saravanan Padmanaban, M.S. Thesis: Computer Aided Design of HDL Model for Overcurrent Relays, October 2000.