

## Curriculum vitae

June 2022

**NAME:** Thomas L. Harman  
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(281) 283-3870 (Fax) e-mail: [harman@uhcl.edu](mailto:harman@uhcl.edu);  
<http://sceweb.sce.uhcl.edu/harman/>

**EDUCATION:**  
B.S.E.E. with Honors, University of Maryland, 1965  
Ph.D. Rice University, Electrical Engineering, 1972

### RELATED EXPERIENCE:

Industrial and Commercial:

1977-Present Consultant

1973-1977 Lockheed Electronics Staff Engineer

## BRIEF HISTORY NASA AND SMALL BUSINESS



- NASA SUPPORT FOR PH.D RESEARCH 1970s
- MINICOMPUTERS IN BUILDING 49 – LOCKHEED
- FIRST ROBOT WAS HEATHKIT HERO FOR DOCKING



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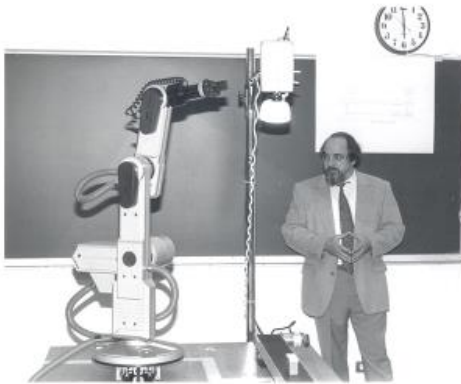


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## EARLY DAYS AT UHCL

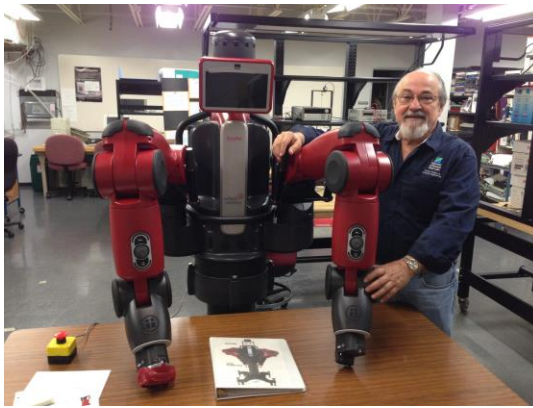


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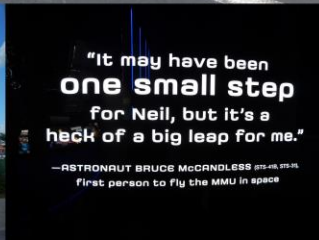
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BAXTER – OUR FAVORITE



TLH, CAROL, DR. NGUYEN



SWARMATHON KSC FLORIDA

**CONSULTING ACTIVITIES:**

Numerous consulting activities include:

- (a) design of microprocessor-based systems
- (b) electrical and electronic design
- (c) interpretation of the National Electrical Code
- (d) expert witness in various legal cases

**PROFESSIONAL REGISTRATIONS AND ORGANIZATIONS:**

Professional Engineer - Texas (Inactive)  
Master Electrician - Houston, Texas and other cities  
Member of National Electrical Code Panel No. 2,  
(National Fire Protection Association)

**PROFESSIONAL SOCIETIES:**

American Society for Engineering Education  
Association for Computing Machinery  
Institute of Electrical and Electronics Engineers  
National Fire Protection Association

**HONORARY SOCIETIES:** Eta Kappa Nu, Sigma Xi, Tau Beta Pi, Phi Kappa Phi

**OTHER DUTIES:**

ISMCR 2019 (International Symposium on Measurement and Control for Robotics)  
Program Committee Chair  
Chair IEEE Life Member Affinity Group (2012- Present)  
Association for Computing Machinery -Chairman (1984)  
IEEE Clear Lake Chapter, various positions including:  
Treasurer (1983-84); Chairman (1985-86)  
Thesis Advisor for several graduate students each semester (UHCL)

**PATENTS:**

US000240631D1

(12) **United States Patent**  
**Seitz et al.**

(10) **Patent No.:** **US 6,246,831 B1**  
(45) **Date of Patent:** **Jun. 12, 2001**

(54) **FLUID HEATING CONTROL SYSTEM**

(75) Inventors: **David E. Seitz**, Conroe; **David Paul Sharp**; **Thomas Lamson Harman**, both of Houston; **Louis J. Everett**, College Station; **Rodney H. Neumann**, The Woodlands, all of TX (US)

(73) Assignee: **David Seitz**, Houston, TX (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/334,337**

(22) Filed: **Jun. 16, 1999**

(51) **Int. Cl.**<sup>7</sup> ..... **F24H 1/10**

(52) **U.S. Cl.** ..... **392/486**; 219/497; 219/483; 392/466

(58) **Field of Search** ..... 392/465, 466, 392/479, 480, 481, 484, 485, 486, 487, 488, 489; 219/483, 497

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,175,075	*	3/1965	Nord et al. ....	392/484
3,909,588		9/1975	Walker et al. .	
4,031,352	*	6/1977	Oosterberg .....	219/497
4,320,285	*	3/1982	Koether .....	219/497
4,337,388		6/1982	July .	
4,638,147		1/1987	Dytch et al. .	
4,829,159		5/1989	Braun et al. .	
4,920,252		4/1990	Yoshino .	
5,128,517	*	7/1992	Bailey et al. ....	219/497
5,216,743		6/1993	Seitz .	
5,479,558		12/1995	White et al. .	
5,504,306		4/1996	Russel et al. .	
5,710,408	*	1/1998	Jones .....	219/497
5,763,858	*	6/1998	Jones .....	219/497
5,789,723	*	8/1998	Hirst .....	219/497
5,811,764	*	9/1998	Hirst .....	219/497

5,866,880	2/1999	Seitz et al. .	
5,928,546	* 7/1999	Kramer et al. ....	219/497
6,047,108	* 4/2000	Sword et al. ....	392/466
6,080,971	* 6/2000	Seitz et al. ....	392/485

\* cited by examiner

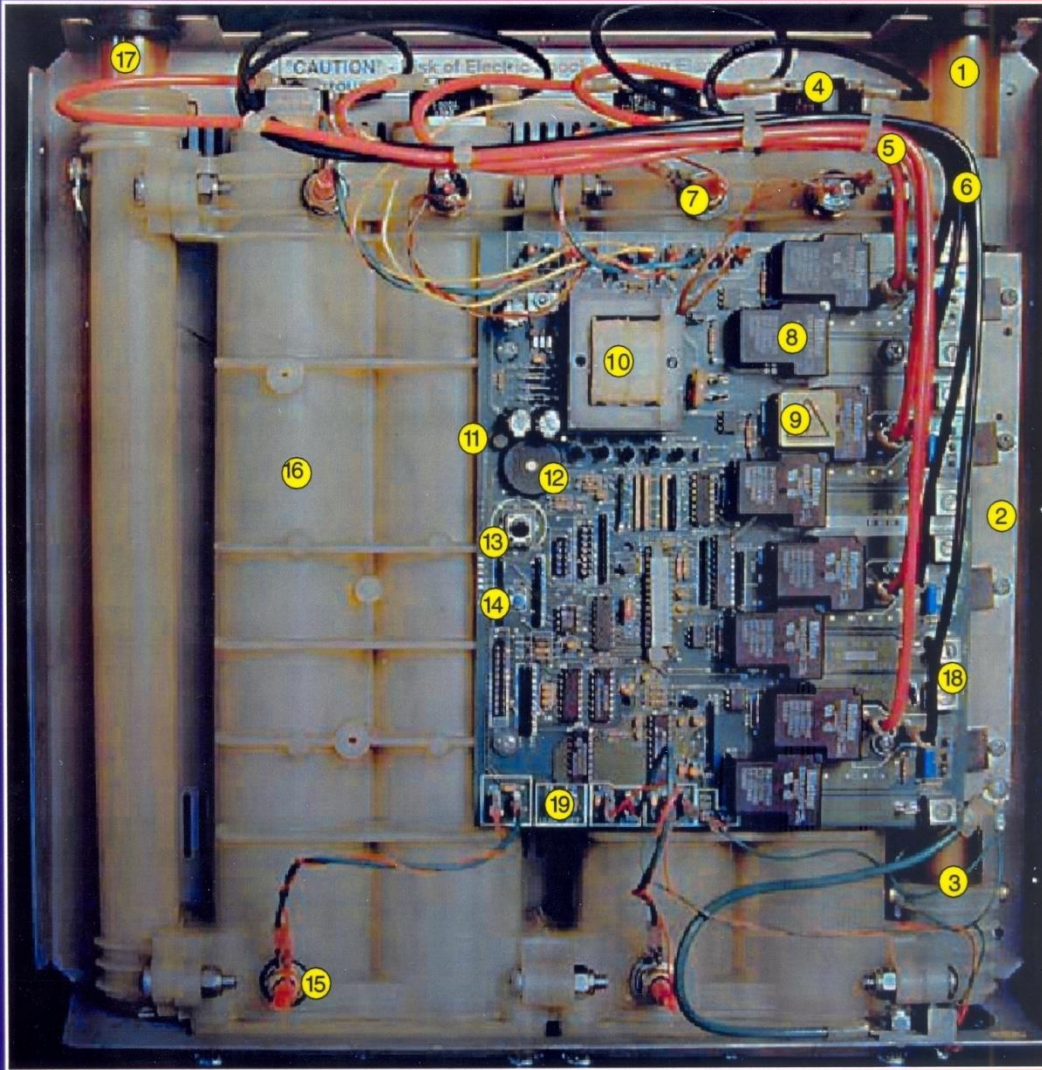
*Primary Examiner*—Teresa Walberg  
*Assistant Examiner*—Fadi H. Dabhour  
(74) *Attorney, Agent, or Firm*—Browning Bushman

(57) **ABSTRACT**

An improved system, method and apparatus for control of an instantaneous flow-through fluid heater system is disclosed. The control incorporates a logic control method providing modulation of power in small steps to a plurality of heating elements retaining responsiveness to closed-loop control needs without inducing light flicker. Further, the life of the coils of heating circuit electromechanical relays are extended by energizing the coils with a pulse-width-modulated drive decreasing in duty cycle and thus the latent coil heat when an increase in mains voltage is sensed. The life of the contacts of same relays are extended by inhibiting heating element triac drive immediately upon sensing loss of relay coil power, such as by an over temperature limit switch opening, thus ensuring that relay contacts open with zero heating element current. In addition to the software "watch-dog timer" internal to the microcontroller, a redundant fail-safe circuit external to the microcontroller prevents a program lockup condition from leaving any heating element triac or relay drive in an energized state. A combination of control hardware and program provide self-diagnostic detection of an inoperative thermistor, stuck relay, or a failed triac or heating element. An improved means of sensing water level is disclosed incorporating a low-level, high frequency signal, allowing detection of non-conducting distilled water and the reliable detection of water in the presence of main-frequency currents as would exist in ungrounded sheathed heating elements with electrical leakage or as would exist with bare-elements.

**29 Claims, 59 Drawing Sheets**

Informational guide to the inner workings of the the SEISCO water heater.



SEISCO

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau

(43) International Publication Date  
25 April 2013 (25.04.2013)



(10) International Publication Number  
**WO 2013/059201 A1**

- (51) International Patent Classification: F24H 1/10 (2006.01) Arlington, VA 22203 (US). **HARMAN, Thomas, L.** [US/US]; 2723 Lighthouse Drive, Houston, TX 77058 (US).
- (21) International Application Number: PCT/US2012/060434 (74) **Agent: HELMREICH, Loren, G.**; 13100 Wortham Center Drive, Suite 245, Houston, TX 77054 (US).
- (22) International Filing Date: 16 October 2012 (16.10.2012) (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 13/274,930 17 October 2011 (17.10.2011) US
- (72) Inventors; and
- (71) Applicants : **SEITZ, David, E.** [US/US]; 3510 Ryoak Street, San Antonio, TX 78217 (US). **DABNEY, James** [US/US]; 1003 Valley Acres, Houston, TX 77062 (US). **EVERETT, Louis** [US/US]; 4001 9th Street N. Apt. 615,

[Continued on next page]

(54) Title: TANKLESS WATER HEATER

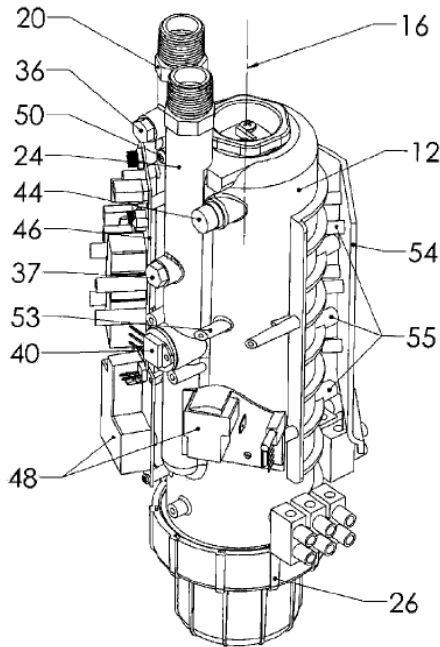


FIGURE 1

(57) Abstract: A water heater (10) is suitable for point-of-use applications. The water heater includes a tank housing (12) and one or more electrically powered heating elements (18). A water inlet line (20) and a water outlet line (24) may be molded as a unitary structure with the tank housing. The water outlet line includes a lower port (68) and an upper port (70) for mixing water in the outlet line. The housing may be mounted such that its axis is either vertical or horizontal.

2013/059201 A1

## **UNIVERSITY POSITIONS**

### Robotics Center Director:

2017- Present Director of Center for Robotics Software UHCL

### Teaching and University Positions:

2012- Present Chairperson of Engineering Department UHCL

1992-2009 Chairperson of Computer Engineering UHCL

1979-Present University of Houston - Clear Lake

Professor of Computer Engineering,

1974-2013 Adjunct or Part-Time Professor (Rice)

## **TEACHING AND UNIVERSITY SERVICE:**

### Memberships

American Society for Engineering Education

IEEE Education Society

### Samples of Previous Service

President Elect of the Faculty Senate 2001, President (2002-2003)

Chairman Computer Engineering Program (1992-2009)

International Affairs Committee (1990-Present)

Faculty Development Committee and Piper Teaching Award Committee

Coordinator - Computer System Design Program (1988-89)

Policy and Curriculum Committee - Chairman (1985-86)

Dean Search Committee and Robotics Committee (1984)

Faculty Senate (1982)

### Samples of Courses Taught

Advanced Engineering Mathematics with MATLAB, Advanced Microcomputer System Design, Biomedical Engineering, Computer Graphics, Digital Signal Processing, Signals and Linear Systems, MATLAB, Network System Specifications, Windows NT, Robotics, Mobile Robots, Electromagnetic Theory, Quantum Mechanics, Quantum Electronics, Electro-optics, Fourier optics.

## **CONFERENCES:**

Robotics Day UHCL - Organizer

NASA Innovations – yearly conference- Session chair.

Joint Applications in Instrumentation Process and Computer Control

- various positions including: Co-Chairman 1984, Program Chairman 1993

IEEE Video Conference on Fiber Optics - Moderator 1985

Computer Development Conference - Chairman 1983



### **EXAMPLE SHORT COURSES AND SEMINARS:**

“ROS (Robot Operating System) Seminar for Industrial Partners” – 3 Days, 2018  
“Robots in the Operating Room and the Doctor’s Office,”  
Mexico 2001, NASA 2005, UHCL 2018  
"Microcontroller Applications in Commercial and Industrial Applications," Mexico 1999  
“Design and Implementation of a reliable IntraNet with Windows NT,” Mexico 1997  
"Applications of Microcontrollers in Systems Design", Sri Lanka 1993  
"The Motorola MC68332 Microcontroller", Mexico 1992  
"Space applications at NASA-JSC", Japan 1991  
"Applications of Microcontrollers", Japan 1991  
"The Motorola MC68030," Motorola, Austin 1988  
"Electrical Design and the National Electrical Code," Union Carbide 1984  
"Master Electrician's Training Course," (various dates)  
"The Motorola MC68020," various dates and locations.  
"Selection and Applications of Modern Microprocessor Systems,” NASA 1983  
"Applications of 16- and 32-bit Microprocessors,” Rice University 1983  
"VLSI Microprocessors," Boumerdes, Algeria - June 1982  
"Applications of the National Electrical Code," Republic of South Korea (1982)

### **SAMPLES OF RESEARCH ACTIVITIES:**

Robotics research with Baxter research robot – Rethink Robotics- Current.  
Development leave for work on laser spectrometers at Rice University 2007.  
ISSO (Institute for Space Systems Operations) grants for "Model-based Control of Piezoelectric Ultrasonic Motor for Space Robotics" - 2002, 03, 04, 05, 06, 07, 08.  
ISSO (Institute of Space Systems Operation), Rice University, and NASA- 5 year grant-starting 1999 for “Development of quantum-cascade laser based biosensor technology”.  
TQM (Total Quality Management) grant for Remote train/robot control 1998  
Consultant- Rice university project- Laser Diode environmental monitor, 1996- Present  
High Technology Laboratories Award for Robotics Research, 1992  
Codirector- High Technology Laboratories (1994-1998)  
Grant Award for research in Japan, Japan Society for the Promotion of Science (Spring 1991)  
Grant Award - Motorola, Inc., "Applications of Microcontrollers," (1989-1990)  
Tunable Laser Diodes with Rice research group (1988-89) - Ongoing work also.  
NASA (Johnson Space Center) Contract "Applications of Microprocessors," (1983)  
UH/CL Grant for 32-bit microprocessor system (1986-1987)  
NSF Grant Award with John Clark (Rice, EE); "A Study of Evoked Volume Conductor Field Potentials from Peripheral Nerve and the Spinal Cord,"(1981-85).  
Grant Award - UH/CL "Microcomputer-based Energy Management Systems," (1979-1980)

**OTHER HONORS, AWARDS OR GRANTS:**

Patent with D. Seitz et. Al. for Tankless Water Heater 10,024,571 July 17, 2018  
UHCL Distinguished and Endowed Professor 2005-2007, 2016-2017  
Patent with D. Seitz for Tankless Water Heater EP 2769152 A1 2013  
Piper teaching award; Nominated in 2011  
Development leave for work on laser spectrometers at Rice University 2007  
Piper teaching award finalist 2002; Nominated in 2004  
President's Distinguished Research Award (UHCL) 2002  
Patent with D. Seitz, et. al. for Fluid Heating Control System – US 6,246,831-2001  
President's Distinguished Teaching Award (Enron) 1999  
Finalist for Piper Teaching Award in 1996; Nominated 2001  
"Star" Award at UHCL in 1995  
Nominated for the Piper Teaching Award; finalist in 1992  
Nominated for Distinguished Research Award (UH/CL) in 1992  
Neumann Cultural Enrichment Award - study of the French language, 1987  
Technical Educator of the Year 1987 - Clear Lake Council of Technical Societies

**OTHER LANGUAGES:** French (Mostly reading)

**PUBLICATIONS and CONFERENCE PAPERS:**

1. "Switching phenomena in Lithium Drifted Silicon p-i-n Diodes," Ph.D. Thesis, Rice University, October 1971.
2. T. L. Harman et al, "Numerical Computation of the External Potential Field of the Isolated Active Purkinge Strand in a Volume Conductor," 1973. SWIEECO Proceedings.
3. T. L. Harman, T. A. Rabson and T. K. Gaylord, "Effects of Intrinsic Region Width in SI(Li) p-i-n Diodes," Solid State Electronics, Vol. 17, pp. 408-411, 1974.
4. T. L. Harman et al, "A Comparison of Two Methods of Determining the Extracellular Potential Field of an Isolated Purkinge Strand in a Volume Conductor," IEEE Transactions, Biomedical Engineering, Vol. BME-22, pp.174-183, May 1975.
5. Minicomputers and Microprocessors, IBM Corporation, Federal Systems Division, Houston, Texas, 1976.
6. J. W. Clark, E. C. Greco and T. L. Harman, "Experience with a Fourier Method for Determining the Extracellular Potential Fields of Excitable Cells with Cylindrical Geometry," Critical Reviews in Bioengineering, CRC Press, Inc., 1978.
7. E. C. Greco, J. W. Clark and T. L. Harman, "Volume-Conductor Fields of the Isolated Axon," Mathematical Biosciences, Vol. 33, pp.235-236, 1977.

8. "Trends in Computer-Based Energy Management Systems," Second Annual Conference on Computer Developments, University of Houston-Clear Lake, December 1980.
9. T. L. Harman, R. Kadri, "The Design of a Microprogrammed Controller Using the AM29116 Bipolar Microprocessor," Fourth Annual Conference on Computer Developments, University of Houston-Clear Lake, November, 1982.
10. T. L. Harman, B. Lawson, "Real-Time Multi-Tasking Operating Systems for 16-bit Microcomputers," Fourth Annual Conference on Computer Developments, University of Houston-Clear Lake, November 1982.
11. "Survey and Applications of VLSI Microprocessors," International Conference on Semiconductors at INELEC, Boumerdes (Algiers), Algeria, June 1982.
12. "Designing with a 16-bit Micro-programmable Processors - the AM 29116," with R. Kadri. Fifth Annual Conference on Computer Developments, University of Houston-1983.
13. T. L. Harman, et al, "Design with the Motorola MC68010," Fifth Annual Conference on Computer Developments, University of Houston-Clear Lake, November 1983.
14. "The Automated Office," with J. Meier. Fifth Annual Conference on Computer Developments, University of Houston-Clear Lake, November, 1983.
15. "Potential Field From an Active Nerve in an Inhomogeneous Anisotropic Conductor: The Forward Problem." With O. B. Wilson, J. W. Clark and N. Ganapathy. IEEE Transactions on Biomedical Engineering, December, 1985.
16. "Potential Field From an Active Nerve in an Inhomogeneous Anisotropic Volume Conductor: The Inverse Problem." With O. B. Wilson, J. W. Clark, N. Ganapathy and S. Cabrera. IEEE Transactions on Biomedical Engineering, December, 1985.
17. Introduction to Robotics Book Review, IEEE EXPERT, May, 1986.
18. "Survey of Robotics Research," Robex 86 (NASA), 1986.
19. "Embedded System Design with Considerations for 32-bit Microcontrollers," with Alan Clapp. AIAA conference, 1991.
20. "Perceptual Linear Prediction and Neural Networks for Speech Analysis," with Sheryl Knotts and James Freeman. International Simulation Technology conference, Houston, Fall 1992.

JAIPCC Conference (2 papers), UH/CL March 26, 1993.

21. "Continuous Emissions Monitoring Techniques for Environmental Compliance and Productivity," with Dianne Wieman
22. "Effects of Tether Stretch Dynamics on a Tethered Satellite Yo-Yo Control Law," with James Dabney, et. al.
23. "Robot control from sequential image planes of a 3D object," with Premkumar, et. al., International Symposium on Optical Instrumentation and Applied Science, San Diego, SPIE Vol. 2018, July 1993.
24. "Analyzer Installations with Long Term Maintenance Considerations," with Dianne Wieman, Instrument Society of America International Conference, Chicago, September 1993.
25. "Creating Complex Timing Functions: Microcontroller Timer Unit or PLD," with Alan Clapp. IEEE MICRO, Vol. 14, No. 2, April 1994, pp. 70-78.
26. "Laser range precision for robot applications," with Premkumar and Nguyen. Optical Society of America Laser Science Conference, Dallas Texas, October 1994.
27. "Robot vision: laser range for depth perception," with Premkumar and Nguyen. Optical Society of America Laser Science Conference, Dallas Texas, October 1994.
28. "Development of an Embedded Control System for Compact Diode Laser Gas Sensor" with George Smayling et. al., Rice Quantum Institute Colloquium, September, 1997.
29. "Embedded Control and Data Acquisition for a Compact Difference-Frequency Laser Spectrometer" Darrin Leleux and I presented a poster describing our research at the Rice Quantum Institute's Summer Research Colloquium.
30. "Dynamic Simulation Software for the Scorbot ER-VII Robot", with A. Izad et. al., Summer Computer Simulation Conference, Reno, Nevada, July 1998.
31. "Applications of MATLAB to the Design and Visualization of Antenna Radiation Patterns", with James Dabney, Innovations '98, March, 1998
32. "Dynamic Simulation Software for the Scorbot ER-VII Robot", with A. Izad et. al., Innovations '98, March, 1998.
33. Contributor to *Comprehensive Dictionary of Electrical Engineering*, CRC Press, 1999.
34. "Process Control for NT Testbed," with D. Gebremichael, et. al., Innovations '99, April 1999 (Abstract and presentation.).

35. "Adaptive filtering applications to real-time laser spectroscopy," D.P. Leleux, T. L. Harman, F.K.Tittel, Optical Society of America Annual Meeting, Providence, RI, October, 2000.
36. "A Systems Approach to Embedded Microprocessor Testing," T. L. Harman, James B. Dabney, and Charles S. Haynes, Innovations 2001, Houston, TX, April 2001.
37. "Applications of Kalman filtering to real-time trace gas concentration measurements," with D.P. Leleux, F.K. Tittel, et. al., Optical Society of America Annual Meeting, Long Beach, CA, October 2001.
38. "Applications of Kalman filtering to real-time trace gas concentration measurements," with D.P. Leleux, F.K. Tittel, et. al., Applied Physics B, November 29, 2001
39. "Digital Signal Processing Application- Image Processing & Recognition," with J.J. Chakkungal, Innovations 2002, May 2002.
40. "Piezoelectric Ultrasonic Motor Modeling: State of the Art and Future Directions" with James Dabney accepted by the International Conference on Signals, Systems, and Information Technology held in Tunisia, March 2003.
41. Dabney, J. B., Ghorbel, F. H., and Harman, T. L., "Issues in piezoelectric ultrasonic motor modeling," Innovations 2003, Houston, Texas, May 2, 2003.
42. "A Personal View of the NEC Code Making Panel 2", *Journal of the International Association of Electrical Inspectors*, July/August 2003.
43. "Atmospheric Formaldehyde Monitoring in the Greater Houston Area in 2002" with Robert F. Curl, Frank K. Tittel, Jinhai Chen, et al., Applied Spectroscopy, Vol. 58, Number 2, 2004.
44. "Go Tankless...and Stay in Hot Water", *Journal of the International Association of Electrical Inspectors*, March/April 2004.
45. "Dynamic Response Modeling of Piezoelectric Ultrasonic Motors", Dabney, J. B., Ghorbel, F. H., and Harman, T. L., Accepted by ASME Congress, November 2005.
46. "Model Based Torque Control of Piezoelectric Ultrasonic Motors", Dabney, J. B., Harman, T.L., Ghorbel, F. H., and Chakkungal, J., International Mechanical Engineering Conference, Chicago, Illinois, November, 2006.
47. "Stable Torque Regulation of Piezoelectric Ultrasonic Motors", Dabney, J. B., Harman, T.L., Ghorbel, F. H, American Society of Civil Engineers, Earth and Space 2008, Long Beach, CA, March, 2008

48. H. Wang, L. Li, G. Song, J. B. Dabney, and T. L. Harman, “Nonlinear fault tolerant control of a space truss structure with MR damper,” *Earth and Space 2010*, Honolulu, Hawaii, March 14 – 17, 2010
49. T. L. Harman, J. B. Dabney, and V. S. Vangala, “What’s new in MATLAB for modeling physical systems with applications to robotics,” *Workshop on Automation and Robotics 2010*, Johnson Space Center, Houston, Texas, November, 2010.
50. T.L. Harman and Lei Wu, “Engaging Students in Science and Engineering Education with Intelligent Robotic Systems Development”, *Innovation 2012*, Johnson Space Center, Houston, TX.
51. M. A. Anthony, T. L. Harman, J. R. Harvey, “Rightsizing Electrical Power Systems in Large Commercial Facilities”, *IEEE Industrial and Commercial Power Systems*, May 2013. (Full paper submitted to IEEE Power Systems Engineering Committee).
52. Thomas L. Harman & James B. Dabney, “Baxter the friendly robot: Applications, architecture, and features”, 2014 Conference: INNOVATION’14 AND AUTOMATION’14, Johnson Space Center, Houston, TX.
53. Han Wang, Luyu Li, Gangbing Song, James B. Dabney and Thomas L. Harman, “A new approach to deal with sensor errors in structural controls with MR damper”, *Smart Structures and Systems*, Vol. 16, No. 2 (2015)
- 54-57. “Why the Robot Operating System is Vital to your Future in Robotics”  
Thomas L. Harman, Ph.D., Carol Fairchild and Luong Nguyen, Ph.D.
- "Creating Robots in Simulation", Carol Fairchild, Thomas L. Harman, Ph.D., and Luong Nguyen, Ph.D.
- “Baxter in robotic research and education at UHCL”, Luong Nguyen, Ph.D., Thomas L. Harman, Ph.D., Carol Fairchild.
- “Series Elastic Actuators Principles and Research Issues”, James B. Dabney and Thomas L. Harman.
- INNOVATION and AUTOMATION 2015 Conference, October 23rd, 2015  
Gilruth Center, NASA/JSC
58. “Right Sizing Commercial Electrical Systems”, Michael A. Anthony, Thomas L. Harman & James R. Harvey, *IEEE Industry Applications*, Vol. 22, No.4, 41-46, July/August 2016.

- 59-60. “ROS Networking for Turtlebot using Ad-hoc Network” Tirumala Sai Krishna, RajaKumar Murali Krishnan, Carol Fairchild, Dr. Thomas Harman,  
 “The NASA Swarmathon and Kennedy Space Center”, Thomas L. Harman, Ph.D. and Luong Nguyen, Ph.D.
- INNOVATION and AUTOMATION 2016, FRIDAY October 28, 2016
61. "Multithreading/Multiprocessing Simulation of the International Space Station Multibody System Using a Divide and Conquer Formulation with Flexible Bodies", Luong Nguyen, T. L. Harman, Elihu Deneke, 19th International Conference on Autonomous Robots and Agents (ICARA 2017) held in Paris France May 18-19, 2017.
- 62-63. “The UHCL Center for Robotics Software”, Thomas L. Harman, Ph.D., Carol Fairchild, Luong Nguyen, Ph.D. (UHCL)
- “Cartesian Space Velocity Control for Baxter with A 3DConnexion Space Mouse Pro device”, Nabil Farhat, Luong Nguyen Ph.D., Thomas L. Harman, Carol Fairchild. INNOVATION and AUTOMATION 2017, SATURDAY October 28, 2017.
64. NASA Conference  
 “Kinematic Redundancy Control for Baxter Robot with A 3DConnexion Space Mouse Pro Device”, Nabil Farhat, Luong Nguyen, Thomas L. Harman, Carol Fairchild, Robotics and Control Systems Laboratory- Home of Baxter the Robot, UHCL, Dual conference in Innovation and Automation, November 3, 2018.
65. Farhat, N. (Presenter Only), Nguyen, L. A. (Author Only), Harman, T. L. (Author Only), Fairchild, C. L. (Author Only), Dual Conference of Innovation and Automation 2018, "Kinematic Redundancy Control for Baxter Robot." (November 3, 2018).
66. Harman, T. L. (Leader), Nguyen, L. A., Robot Operating System, "Robot Operating System," Center for Robotics Software, UHCL. (January 2018).  
 Type: Three-day Seminar to local Company
67. Nguyen, L. A., Harman, T. L., Fairchild, C. (2019). Swarmathon: A Swarm Robotics Experiment For Future Space Exploration. *International Symposium of Measurement, Control and Robotics 2019*.
66. “Kinematic Redundancy Resolution for Baxter Robot”, Nguyen, L, Khoa D. Le, Thomas L. Harman, Accepted 2020-2021, *ICARA 2021* | February 4-6, 2021 - Prague, Czech Republic, (2021 International Conference on Automation, Robotics and Applications).

67. “Inverse Kinematics For Serial Robot Manipulator End Effector Position And Orientation Particle Swarm Optimization”, Dr. Luong Nguyen, Dr. Thomas L. Harman, and Hasan Danaci, 2022 26th International Conference on Methods and Models in Automation and Robotics, to be held in Miedzyzdroje, Poland from 22-25 August 2022.

68. “Evaluating FPGA Acceleration on Binarized Neural Networks and Quantized Neural Networks”, Sarala K Surapally, Xiaokun Yang, Thomas L Harman, and Liwen Shih, ISMCR2022 (24th International Symposium on Measurement and Control in Robotics), September 28-30, 2022

**TEXTBOOKS:**





1. *The Motorola MC68020 and MC68030 Microprocessors*,  
T.L. Harman, Prentice-Hall, 1989.
2. *Microprocessori, 68020/68030*, Italian language version of textbook published in English as *The Motorola MC68020 and MC68030 Microprocessors*, Prentice Hall International, 1990.
3. *The Motorola MC68332 Microcontroller*,  
T. L. Harman, Prentice-Hall, 1991.
4. *The Motorola MC68000 Microprocessor Family*  
Harman and Hein, Prentice-Hall, 2nd edition 1996.  
(A Dutch version of the first edition has been published.)
5. *Simulink Student Edition User's Guide*, Prentice Hall Publishers, 1997.  
(With James Dabney)
6. *Mastering Simulink 2*, Prentice Hall, 1998  
(With James Dabney)
7. *Advanced Engineering Mathematics with MATLAB*, Brooks/Cole, 2000.  
(With Dabney and Richert) - 2nd Edition - 2000
8. *Mastering Simulink 4*, Prentice Hall, 2001, 2003 (With James Dabney)
9. *Guide to the National Electrical Code – 2011*, Prentice-Hall, 2011 (Eleventh Edition -  
Published every three years).
10. *ROS Robotics By Example 2<sup>nd</sup> Edition*, Carol Fairchild and Dr. Thomas L. Harman, Packt  
Publishing, ISBN 139781788479592, November 2017.