

MICHAEL E. MADDOX

**Principal Scientist
Sisyphus Associates, LLC**

EDUCATION

- PhD Virginia Polytechnic Institute and State University (VPI&SU), 1979,
Industrial Engineering and Operations Research (IEOR) - Human Factors
Specialization
- MS VPI&SU, 1977, IEOR - Human Factors Specialization
- BS VPI&SU, 1972, Physics, Minor in Mathematics and Psychology

PROFESSIONAL CERTIFICATION

Certified Human Factors Professional (CHFP) by The Board of Certification in
Professional Ergonomics
Certificate #034 (1992 – re-certified in 2014)

PROFESSIONAL INTERESTS

- Legal research and testimony
- Effects of fatigue on human performance
- Driver behavior
- Visibility and conspicuity, especially in nighttime conditions
- Slips, trips, and falls
- System design and evaluation
- User interface design and evaluation
- Training design and evaluation
- Product design and evaluation
- Product and system safety

PROFESSIONAL APPOINTMENTS

1987-present

Principal Scientist, Sisyphus Associates, LLC, Madison, NC.

Provide expert consulting services to attorneys. Analyze, design and evaluate products, displays, workstations, and other human-machine systems to ensure that users' needs and capabilities are accommodated. Evaluate new technology and adapt such technology to clients' business needs. Locate and manage subcontractors, locate and obtain materials, and manage budgets related to analyzing, developing, and evaluating, clients' business-related systems. Consult in all areas of human-machine interaction and systems design.

2003-2011

Senior Scientist, HumanCentric Technologies

Develop legal and hospital (patient safety) business areas. Consult on projects requiring extensive experience in product development, human error reduction, systems analysis and design, and UI design and testing. Pursue SBIR funding for various developmental products. Act as point of contact within HCT for Sisyphus clients and professional associates. Keep abreast of developments in health care, legal, and other fields. Maintain high profile within the Human Factors and Ergonomics Society (HFES) and other professional organizations.

1998-2009

Member, Human Factors Plus, L.L.C.

In partnership with other Members, conduct state of the art human factors consulting and research. The Members of Human Factors Plus are all nationally-recognized human factors practitioners with other, independent businesses. This partnership vehicle allows Members to take on work that is either too large in scope or too widely dispersed (geographically) for any individual Member to support. With a broad network of independent experts in many fields, the Members can assemble top-notch project teams to work on a broad range of human-factors-related projects. Human Factors Plus specializes in the design of consumer and medical products, including information distribution systems and medical devices.

1985-1987

Director of Consulting Services, Search Technology, Inc., Norcross, GA.

Direct the consulting activities of Search Technology in all areas. Formulate policies related to professional consulting in all areas of company expertise. Responsible for overall strategy for marketing, delivering, and managing consulting services. Act as point of contact between Search Technology and consulting clients.

1983-1987

Senior Scientist, Search Technology, Inc., Norcross, GA.

Conduct applied research for government agencies and commercial clients in the areas of computer-generated display design, computer-based training, human-computer interaction, decision aiding, and general human factors design. Act as a consultant to clients in the areas of human performance measurement and evaluation, product evaluation, nuclear power plant control room design, and display design and evaluation.

1980-1982

Project Manager in Operations Engineering Division, Institute of Nuclear Power Operations, Atlanta, GA.

Manage projects which: develop human factors evaluation criteria and recommend operating practices for the nuclear power industry; evaluate nuclear power plants for conformance to good human engineering practices; develop computerized human engineering databases for utility and internal use; review and coordinate computerized displays for new applications; and provide timely human engineering data to the nuclear industry. Present workshops and seminars on human factors topics for utility personnel. Represent INPO at national and international professional society and standards meetings. Serve as an expert consultant to nuclear utilities.

1978-1980

Research Associate, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Responsible for experimental design and execution of research under contract to the Air Force Office of Scientific Research. Experimental program to evaluate the effects of various image enhancement algorithms on photo-interpreter performance. In addition to laboratory computer systems, equipment included International Imaging Systems Model 70E digital imaging system.

Consultant to Texas Instruments Company - evaluation of prototype displays.

Consultant to Pitney-Bowes Company - evaluation of copy print quality.

1975-1978

Graduate Research Assistant, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Performed studies on the effects of parameters of computer-generated dot-matrix displays on human performance. Responsible for computer software and experimental design in support of research sponsored by the Army Research Office and the Air Force Office of Scientific Research. This research dealt mainly with the assessment of the quality of computer-generated displays.

1974-1975

Instrumentation Engineer, Babcock and Wilcox Company, Nuclear Power Generation Division, Lynchburg, VA.

Responsible for plant computer systems for several B&W nuclear plants. Responsible for configuring final specification for computer system and all peripherals to be installed at certain B&W plants. Included in this specification was the database for monitoring all important functions within the plant. This necessitated familiarization with virtually all instrumentation for each plant system.

1972-1974

Instrumentation Engineer, Goodyear Atomic Corporation, Piketon, OH.

Responsible for the design, development, and implementation of instrumentation systems for gaseous diffusion process control and quality assurance. Involved with computer-oriented data acquisition and control systems. During this period, worked with HP and DEC computer systems. In addition to computer-based systems, worked with conventional control and instrumentation systems, both pneumatic and electronic. Much of this work was classified by the AEC (now NRC). Maintained AEC Q-clearance.

1968-1972

Co-operative Education Student, Goodyear Atomic Corporation, Piketon, OH.

Assisted professional staff in research, laboratory, and engineering development work. Worked one quarter each in Health Physics, Physical Measurements (electron microscopy and x-ray analysis), and Mass Spectrometry. Worked three academic quarters in Instrumentation Development Department. While in Physical Measurements, authored an internal technical report on x-ray fluorescence analysis of binary and tertiary metal mixtures. During the work quarters in Instrumentation Development, assisted in the preparation of a report on a new computer-based automatic test stand.

PROFESSIONAL ASSOCIATIONS

Human Factors and Ergonomics Society (HFES) - Fellow
Association for Computing Machinery (ACM)
Institute of Electrical and Electronics Engineers (IEEE)
Institute of Industrial Engineers (IIE)
Phi Kappa Phi (National Honor Fraternity)
Sigma Xi (National Research Society)

PROFESSIONAL ACTIVITIES

Fellow of the Human Factors and Ergonomics Society

Member of the Application Review Committee for the Board of Certification in Professional Ergonomics

Member of the Editorial Board of the *Journal of the Human Factors and Ergonomics Society*: 1984 - 2000.

Member of the Scholastic Accreditation Committee of the Human Factors and Ergonomics Society.

Chairman of the writing committee for IEEE Standard 845-1988, "Guide to Evaluation of Man-Machine Performance in Nuclear Power Generating Station Control Rooms and other Peripheries".

Reviewer for various professional publications, including *Ergonomics in Design* and *Applied Ergonomics*.

Reviewer of SBIR grant applications for the National Institutes for Health (2 years)

Judge for the Computerworld/Smithsonian Awards (2 years)

PUBLICATIONS

Maddox, M.E., and Kiefer, A. (2015). Modeling the effects of disability glare on trailer side underride crashes. *Proceedings of the 59th Annual Meeting of the Human Factors and Ergonomics Society*, 395-399. Santa Monica, CA: Human Factors and Ergonomics Society.

Maddox, M.E., and Kiefer A. (2012). Looming threshold limits and their use in forensic practice. *Proceedings of the 56th Annual Meeting of the Human Factors and Ergonomics Society* 700-704. Santa Monica, CA: Human Factors and Ergonomics Society.

Maddox, M.E., Fitch, G., Kiefer, A., Mortimer, R. and Muttart, J. (2012). Panel discussion – Factors related to perceiving the relative speed of leading vehicles in high-speed rear-end crashes. *Proceedings of the 56th Annual Meeting of the Human Factors and Ergonomics Society* 690-694. Santa Monica, CA: Human Factors and Ergonomics Society.

Maddox, M.E., and Avery, L. W. (2011). Device lifecycle. In Weinger, M.B., et al. (Editors). *Handbook of human factors in medical device design*. New York, NY: Taylor & Francis

Maddox, M.E., and Avery, L. W. (2011). Packaging. In Weinger, M.B., et al. (Editors). *Handbook of human factors in medical device design*. New York, NY: Taylor & Francis

Muto, W.H., and Maddox, M.E. (2011). Visual displays. In Weinger, M.B., et al. (Editors). *Handbook on human factors in medical device design*. New York, NY: Taylor & Francis.

Maddox, M.E. Editor (2008). *Human Factors Guide for Aviation Maintenance and Inspection*. Web document.
<https://hfskyway.faa.gov/hfskyway/guide.aspx?AspxAutoDetectCookieSupport=1>
Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Human factors, in Maddox, M.E. (Editor) *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Establishing a human factors program, in Maddox, M.E. (Editor) *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Fatigue and fitness for duty, in Maddox, M.E. (Editor) *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Facility design/usability, in Maddox, M.E. (Editor) *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Shiftwork and Scheduling, in Maddox, M.E. (Editor) *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Workplace safety, in Maddox, M.E. (Editor) ***Human Factors Guide for Aviation Maintenance and Inspection***. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Communication, in Maddox, M.E. (Editor) ***Human Factors Guide for Aviation Maintenance and Inspection***. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (2008). Infamous computer glitch. ***Industrial Engineer***, 40(12), 20.

Maddox, M.E. (2008). Pretty is as pretty does. ***Industrial Engineer***, 40(9), 22.

Maddox, M.E. (2008). Say what? ***Industrial Engineer***, 40(6), 22.

Maddox, M.E. (2008). Human factors 101. ***Industrial Engineer***, 40(3), 22.

Maddox, M.E. (2007). The good, the bad, the mediocre. ***Industrial Engineer***, 39(12), 22.

Maddox, M.E. (2007). No need for slack time. ***Industrial Engineer***, 39(9), 26.

Maddox, M.E. (2007). Half of nothin' is nothin'. ***Industrial Engineer***, 39(6), 23.

Maddox, M.E. (2007). What the heck does this button do? ***Industrial Engineer***, 39(3), 22.

Johnson, W.B., and Maddox, M.E. (2007). A PEAR shaped model for better human factors. ***Civil Aviation Training***, February, 2007, 20-21.

Johnson, W.B., and Maddox, M.E. (2007). A model to explain human factors in aviation maintenance. ***Avionics News***, April, 2007, 38-43.

Maddox, M.E. (2006). When lean is mean. ***Industrial Engineer***, 38(12), 22.

Maddox, M.E. (2006). Duh! ***Industrial Engineer***, 38(9), 24.

Maddox, M.E. (2006). Wrong again. ***Industrial Engineer***, 38(6), 24.

Maddox, M.E. (2006). You did what?. ***Industrial Engineer***, 38(3), 26.

Maddox, M.E. (2005). Objective tyranny. ***Industrial Engineer***, 37(12), 24.

Maddox, M.E. (2005). The Doh! effect. ***Industrial Engineer***, 37(9), 26.

Maddox, M.E. (2005). The simulated user. ***Industrial Engineer***, 37(6), 22.

Maddox, M.E. (2005). Error apparent. ***Industrial Engineer***, 37(5), 40-44.

Maddox, M.E., and Barnes, J. (2004) ***Risky Business: Analysis Tools for Medical Devices and Processes***. Workshop presented at the 48th Annual Meeting of the Human Factors and Ergonomics Society, HFES.

- Maddox, M.E., and Cox, N. (2001) Developing a quarter-VGA user interface. *Proceedings of the 45th Annual Meeting of the Human Factors and Ergonomics Society*, 570-574.
- Maddox, M.E., and Muto, W.H. (1999). Three Mile Island: The human side. *Ergonomics in Design*, April, 1999, pp. 6-12.
- Maddox, M.E. (Editor) (1998). *Human Factors Guide for Aviation Maintenance and Inspection, Third Edition*. Washington, DC: Federal Aviation Administration.
- Maddox, M.E. (1998). How flatpicking guitar players can avoid injuries. *Flatpicking Guitar Magazine*, January/February, 1998, pp. 72-75.
- Maddox, M.E. (1997). Designing medical devices to minimize human error. *Medical Device & Diagnostic Industry*, May, 1997, pp. 166-178.
- Maddox, M.E., and Buzzard, J. (1996). *Combining the best elements of human factors and industrial design in a real-world consumer product*. Poster session presented at the 40th Annual Meeting of the Human Factors and Ergonomics Society.
- Maddox, M.E. (1996). Cost justification: How do we quantify what doesn't happen. *Ergonomics Intelligence Report*, September, 1996, p. 12.
- Maddox, M.E. (1996). A practical view of the technical and legal issues related to warnings. *North Carolina Lawyers Weekly*, 8(50), March 11, 1996, pg. 15-17.
- Reason, J., and Maddox, M.E. (1996). Human error. In M.E. Maddox (Ed.) , *Human Factors Guide for Aviation Maintenance and Inspection, Second Edition*. Washington, DC: Federal Aviation Administration.
- Maddox, M.E. (1995) Providing useful human factors guidance to aviation maintenance practitioners. *Proceedings of the 39th Annual Meeting of the Human Factors and Ergonomics Society*.
- Maddox, M.E. (Editor) (1995) *Human factors guide for aviation maintenance and inspection*. Washington, DC: Federal Aviation Administration.
- Maddox, M.E. (1995) Human factors. In M.E. Maddox (Ed.), *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.
- Maddox, M.E. (1995) Shiftwork and scheduling. In M.E. Maddox (Ed.), *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.
- Maddox, M.E. (1995) Facility design. In M.E. Maddox (Ed.), *Human Factors Guide for Aviation Maintenance and Inspection*. Washington, DC: Federal Aviation Administration.

Maddox, M.E., and Parker, J.F., Jr. (1995) Training. In M.E. Maddox (Ed.), ***Human Factors Guide for Aviation Maintenance and Inspection***. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (1995) Testing and troubleshooting. In M.E. Maddox (Ed.), ***Human Factors Guide for Aviation Maintenance and Inspection***. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (1995) Personal and job-related factors. In M.E. Maddox (Ed.), ***Human Factors Guide for Aviation Maintenance and Inspection***. Washington, DC: Federal Aviation Administration.

Maddox, M.E. (1994) Introducing a practical human factors guide into the aviation maintenance environment. ***Proceedings of the Human Factors and Ergonomics Society 38th Annual Meeting***, 101-105. Santa Monica, CA: Human Factors and Ergonomics Society.

Maddox, M.E. (1994) ***NDTA general commercial transportation model***. Report prepared for the Information Integration Panel of the National Defense Transportation Association (NDTA) Technology Committee. Cambridge, MA: DOT - Volpe Center.

Maddox, M.E. (1993) In Huey, B.M., and Wickens, C.D. (Eds.) ***Workload Transition: Implications for Individual and Team Performance***. Washington, D.C.: National Academy Press.

Maddox, M. E., and Allen, D.M. (1993) What have you done to my interface? Transitioning from prototype to implementation. ***Ergonomics in Design***, January, 1993, 12-19.

Shields, J.L., and Maddox, M.E. (1991) Workload Transition: Job design and training issues. ***Proceedings of the Human Factors Society 35th Annual Meeting***, 982-986. Santa Monica, CA: Human Factors Society.

Maddox, M.E., and Turpin, J.A. (1989) Design of a consumer computer terminal for automated access to overnight delivery services. ***Proceedings of the Human Factors Society 33rd Annual Meeting***, 465-469. Santa Monica, CA: Human Factors Society.

Johnson, W.B., Wiederholt, B.J., and Maddox, M.E. (1986). ***Diagnostic training demonstration: Instructor and student manuals and sample diskettes*** (EPRI NP-4493P). Palo Alto, CA: Electric Power Research Institute.

Maddox, M.E. and Turpin, J.A. (1986). The effect of number ordering and orientation on marking speed and errors for mark-sensed labels. ***Human Factors***, 28, 401-405.

Hunt, R.M. and Maddox, M.E. (1986). A practical method for designing human-machine system interfaces. ***Proceedings of the International Conference on Systems, Man, and Cybernetics***, IEEE.

Maddox, M.E. and Johnson, W.B. (1986). Can you see it? Can you understand it? Does it work? An evaluation plan for computer-based instruction. ***Proceedings of the International***

Topical Meeting on Advances in Human Factors in Nuclear Power Systems, American Nuclear Society, Knoxville, TN.

Johnson, W.B. and Maddox, M.E. (1986). Development, implementation, and evaluation of computer-based simulation for operations and maintenance troubleshooting training in nuclear power stations. ***Proceedings of the International Topical Meeting on Advances in Human Factors in Nuclear Power Systems***, American Nuclear Society, Knoxville, TN.

Maddox, M.E., Johnson, W.B., and Frey, P.R. (1986). Diagnostic training for nuclear plant personnel, Volume 2: Implementation and evaluation. Palo Alto, CA: Electric Power Research Institute.

Maddox, M.E., Johnson, W.B., and Frey, P.R. (1985). A transfer of training study in the nuclear power industry: from simulation to live performance. ***Proceedings of the 29th Annual Meeting of the Human Factors Society***, Baltimore, MD.

Johnson, W.B., Maddox, M.E., Rouse, W.B., and Kiel, G.C. (1985). Diagnostic training for nuclear plant personnel, Volume 1: Courseware development. Palo Alto, CA: Electric Power Research Institute.

Turpin, J.A. and Maddox, M.E. (1984). Subjective ranking of facsimile document quality scanned at different resolutions. ***Proceedings of the 28th Annual Meeting of the Human Factors Society***, San Antonio, TX.

Johnson, W.B., Maddox, M.E., and Kiel, G.C. (1984). Simulation-oriented computer-based instruction for training nuclear plant personnel. ***Proceedings of the 28th Annual Meeting of the Human Factors Society***, San Antonio, TX.

Hunt, R.M., Maddox, M.E., and Kiel, G.C. (1983). Computer-generated display system guides, Volume 3: Display design. Palo Alto, CA: Electric Power Research Institute.

Maddox, M.E. (1983). The interpretation of human factors design criteria for nuclear power plant control room reviews. ***Proceedings of the 27th Annual Meeting of the Human Factors Society***, Norfolk, VA.

Johnson, W.B., and Maddox, M.E. (1983). Status of diagnostic training in the nuclear utility industry. ***Proceedings of the 27th Annual Meeting of the Human Factors Society***, Norfolk, VA.

Zebroski, E.L., Maddox, M.E., and Dietz, P.E. (1982). Establishing priorities in control room design review. ***Nuclear Engineering International***, 27, 30-34.

Maddox, M.E. (1982). The integration of human factors methodology into nuclear power plant control room reviews. ***Proceedings of the 26th Annual Meeting of the Human Factors Society***, Seattle, WA.

Maddox, M.E. (1982). Human factors implications in the introduction of computer aids into existing control rooms. *Proceedings of the Edison Electric Institute Engineering and Operating Computer Forum*, Denver, CO.

Maddox, M.E., and Brickey, M.C. (1982). INPO/TVA pilot systems review. Atlanta, GA: Institute of Nuclear Power Operations, INPO-82-14.

Snyder, H.L., Shedivy, D.I., and Maddox, M.E. (1981). Quality metrics of digitally-derived imagery and their relation to interpreter performance III - Subjective scaling of hard-copy digital imagery. Blacksburg, VA: Virginia Polytechnic Institute and State University, HFL-81-3.

Snyder, H.L., Turpin, J.A., and Maddox, M.E. (1981). Quality metrics of digitally-derived imagery and their relation to interpreter performance II - Effects of blur and noise on hard-copy interpretability. Blacksburg, VA: Virginia Polytechnic Institute and State University, HFL-81-2.

Maddox, M.E. (1980). Two-dimensional spatial frequency content and confusions among computer-generated dot-matrix characters. *SID Proceedings*, *21*, 31-40.

Maddox, M.E. (1979). Two-dimensional spatial frequency content and confusions among computer-generated dot-matrix characters. *Proceedings of the 23rd Annual Meeting of the Human Factors Society*, Boston, MA. Runner-up in the student paper competition.

Snyder, H.L., and Maddox, M.E. (1979). Image quality for dot-matrix displays. *SID Proceedings*, *21*, 3-8.

Snyder, H.L., and Maddox, M.E. (1978). Legibility optimization of computer-generated dot-matrix alphanumerics. *Proceedings of the 1978 International Conference on Cybernetics and Society*, Tokyo, Japan.

Snyder, H.L., and Maddox, M.E. (1978). Information transfer for computer-generated dot-matrix displays. Blacksburg, VA: Virginia Polytechnic Institute and State University, HFL-78-3/ARO-78-1.

Maddox, M.E., Burnette, J.T., and Gutmann, J.C. (1977) Font comparisons for 5 X 7 dot-matrix characters. *Human Factors*, *19*, 89-93.

Maddox, M.E. (1977). Prediction of information transfer from computer-generated dot-matrix displays. *Proceedings of the 21st Annual Meeting of the Human Factors Society*, San Francisco, CA.

Maddox, M.E. (1976). Font comparisons for 5 X 7 dot-matrix characters. *Proceedings of the 84th Annual Meeting of the American Psychological Association, Division 21*, Washington, D.C.

WORKSHOPS

Maddox, M.E., Barnes, J., and Delano, K. (2004). **Risky Business: Analysis Tools for Medical Devices and Processes.** Full-day workshop presented at the 48th Annual Meeting of the Human Factors and Ergonomics Society. September 20, 2004.