

Michael Jay Schillaci, Ph.D.

Center for Science Education | University of South Carolina | mjs@evsis.org | (803) 777- 9645

Work History

- **University of South Carolina, Columbia, South Carolina**
Assistant Director, The Center for Science Education 06.2010 – Present
- **Rochester Institute of Technology, Rochester, New York**
Lecturer of Physics 12.2008 – 05.2010
 - Undergraduate physics instruction (Workshop Physics) and curriculum development; applied computational neuroscience research; Physics education research (PER).
- **University of South Carolina, Columbia, South Carolina**
Managing Director, McCausland Center for Brain Imaging 12.2006 – 10.2008
 - Manage all aspects of daily operation of Siemens Trio MRI system to include booking, billing and coordination of routine and emergency maintenance scheduling with hospital staff; teach multi-disciplinary classes and mentor student projects.
- **University of South Carolina, Columbia, South Carolina**
Assistant Research Professor of Psychology 01.2004 – 12.2006
 - Design and test software for the analysis of neuro-physiological data; instrumental in the design of experiments using Scalp Voltage and fMRI measures for the Detection of Deception; research policy implications for technology deployment.
- **Francis Marion University, Florence, South Carolina**
Assistant Professor of Physics 08. 1998 – 12.2003
 - Led departmental initiative to establish Computational Physics curriculum and served as administrator of computing the facility; served as a Faculty Senator and as Chairman for IT Subcommittee where I helped develop internal grant guidelines and oversaw dispersal of funds; served as research advisor for nine students.

Educational Background

- **University of Arkansas, Fayetteville, Arkansas**
Ph.D. Physics 05.1999
 - Developed a mathematical model for the description of low-energy atomic collisions and scattering cross-sections; where necessary, native code was developed to simulate relevant processes.
- **University of Arkansas, Fayetteville, Arkansas**
M.A. Physics 05.1995
 - Contributed to the design and testing of a ring-laser system for the study of near-threshold photon statistics; participated in grant writing and hardware acquisition.
- **State University of New York, Brockport, New York**
B.S. Physics and Mathematics 05.1992
 - Conducted advanced research in Photo-Chemistry and in Nuclear Physics; served as a teaching assistant in Physics and as a tutor for Mathematics and Economics.

Computing Experience

- **Operating Systems**
 - WIN, Linux, UNIX, MAC
- **Programming Languages**
 - VB, FORTRAN, JAVA, C++, HTML, Javascript, Perl
- **Software Packages and Web-based**
 - MAPLE, MATLAB, SAS

Classes Taught

Undergraduate

- Physical Science for Non-Majors
- Introductory Physics and Laboratory
- Classical Mechanics
- Electricity and Magnetism
- Mathematical Methods in Computational Physics
- Advanced Computational Methods
- Quantum Mechanics

Graduate

- Introduction to MRI Physics and Analysis
- Neuroimaging of Cognition

Published Papers and Abstracts

- Schillaci, M. J. "Total Tomography," *Computing in Science and Engineering*, vol. 11, no. 2, pp. 12-13, March/April, 2009.
- Schillaci, M. J. "Computationally Complete," *Computing in Science and Engineering*, vol. 9, no. 3, pp. 3-6, May/Jun, 2007.
- Vendemia, J.M.C., Schillaci, M.J., & Buzan, R.F. Credibility Assessment: Psychophysiology and Policy in the Detection of Deception. *Journal of Forensic Psychology*, Vol. 24, issue 4, 2006.
- Vendemia, J.M.C., Buzan, R.F., Green, E.P., & Schillaci, M.J. Neural Mechanisms of Deception and Response Congruity in a Visual Two-Stimulus Paradigm with Motor Response, *Journal of Neurotherapy*, Vol. 9 Num. 3, 2005.
- A Two-State Analysis of ERP Activity Measures and fMRI Activations Relevant to the Detection of Deception. APS 2007 (K1.00032).
- Top-Down Physics: SESAPS 2006, Williamsburg, Virginia, November 11, 2006.
- Practice Effects on ERP-Components Related to Deceptive Responses: SESAPS 2006, Williamsburg, Virginia, November 11, 2006. (Poster G004)
- Schillaci, M. J. A Quantum Analysis of Scalp Potential Data for Repeated Mock Interrogation Trials, CNS 2006 (A10).
- Simulated Thin-Film Growth and Imaging, APS 2002 (H3.003).
- Computational Physics in a Nutshell, SESAPS 2001 (JC.007).

Book Chapters and Review Articles

- Schillaci, M. J. "Total Tomography," *Computing in Science and Engineering*, vol. 11, no. 2, pp. 12-13, March/April, 2009.
- Schillaci, M. J. "Computationally Complete," *Computing in Science and Engineering*, vol. 9, no. 3, pp. 3-6, May/Jun, 2007.
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P., & Meek, S. W.. Chapter 15: The Application of Biomedical and Alternative Technologies to the Measurement of Deceptive Behavior. in L. Madsen, D. Gruben, & D. Wilcox (eds.), *Polygraph Post-Conviction Sex Offender Testing*. (In Press)

Online Publications, Self-Published Textbooks and Manuals

- *Top-Down Physics: The Nature of the Physical World*. Copyright © 2010, Michael Jay Schillaci. The manuscript is nearly completed and portions may be viewed online at: <http://www.evsis.org/download.html>.
- Schillaci, M. J. *An Introduction to MAPLE*. Copyright. The manual may be downloaded at: <http://www.evsis.org/docs/m5intro.pdf>
- Schillaci, M. J. (2000). Local Momentum and a Three-Body Gauge. Thesis-related material, publication available online at <http://xxx.lanl.gov/abs/physics/0009024>.

External Grants and Matching Funds

- 01.2007 – 01.2009: Co-Principal Investigator; **\$1,250,000**
U.S. Army Medical Research Acquisition Activity, (USAMRAA); *Continuation Brain Imaging Research: The Detection of Deception Utilizing HD-ERP, fMRI, and Pupillometry.*
- 12.2005 – 12.2008; Co-Principal Investigator; **\$3,660,000**
U.S. Army Medical Research Acquisition Activity (USAMRAA); *Brain Imaging Research: The Detection of Deception Utilizing HD-ERP, fMRI, and Pupillometry.*
(\$2.1M from this grant was allocated to the purchase of a 3T Siemens' Magnetom Trio Magnetic Resonance Imaging system, which serves as the centerpiece for the McCausland Center for Brain at the University of South Carolina.)
- 01.2004 – 09.2009; *Research Associate*; **\$487,000**
National Science Foundation (NSF); *Modeling the Neurocognitive Processes of Deception*;
- 10.2003 – 10.2004; Principal Investigator; **\$11,000**
Francis Marion University (competitive) internal and State Lottery matching funds awarded to establish a Computational Physics Laboratory.

Invited Speaker and/or Sponsored Participation

- Analysis of Electric Scalp Potential and Functional Magnetic Resonance Imaging Data Relevant to the Detection of Deception. Invited Speaker, Fourth Conference on Mathematical Methods in Counterterrorism (CMMC). Rochester Institute of technology, Rochester, NY, September 20-22, 2007.
- Contemplative Experience and Cognitive Psychology. Senior researcher, Mind & Life Research Institute, Garrison, NY, July 2004.
- Top-Down Physics. Invited participant, Davidson Summer Workshop on Open Source Physics, Davidson, NC, July, 2003.
- NSF-supported workshop for physics faculty. Sponsored participant, Lawrence University, Appleton, WI, July, 21-28, 2002.
- Mind or Brain? Science and Spirit. Guest lecturer, Anthropology, Department of Anthropology, University of South Carolina, April 2006.
- Problem Solving as A Cognitive Task: Guest lecturer, Cognitive Psychology, Department of Psychology, University of South Carolina, September 2002.
- Thin Films; Uses, Models, Images: Invited speaker, Coastal Carolina University, Conway, SC. February, 2000.

Research Collaborations and Project Participation

- Information-Theoretic Analyses (Svetlana Shinkareva, Department of Psychology, University of South Carolina) Implementation of original Matlab and C++ code to use an information-theoretic approach to classify BOLD fMRI levels for different (tool/dwelling) categories.
- Detection of Deception (Jennifer Vendemia, Department of Psychology, University of South Carolina) Design/testing/analysis of EEG and MRI experiments; program review/assessment; software development and technology transfer; review of interrogation techniques.
- Image Analysis and Reconstruction Review of computerized tomography (CT) and signal analysis (reduction of SNR); image reconstruction/subtraction algorithms; region of interest (ROI) based analysis.
- Nonlinear Optics and Laser Systems (Surendra Singh, Department of Physics, University of Arkansas) Operation (tuning/alignment) of Ti-Sapphire system; design and testing of YAG ring laser for parametric down conversion and modeling of near threshold statistics.

Professional Presentations (partial list)

- Schillaci, M. J. A Two-State Analysis of ERP Activity Measures and fMRI Activations Relevant to the Detection of Deception. APS 2007, Denver, Colorado, November, 6 2007. (Poster K1.00032)
- Schillaci, M. J. Top-Down Physics: SESAPS 2006, Williamsburg, Virginia, November 11, 2006.
- Schillaci, M. J. ., Vendemia, J. M. C., Buzan, R. F., Green, E. P., & Meek, S. W. Practice Effects on ERP-Components Related to Deceptive Responses: SESAPS 2006, Williamsburg, Virginia, November 11, 2006. (Poster G004)
- From Brains to Branes: University of South Carolina, Invited Speaker, Departmental Colloquium Series, Thursday, September 21, 2006.
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., & Meek, S. W. (March, 2006). The Future of Alternative Technologies for the Detection of Deception: Implications, Improbabilities, and Impossibilities. Paper presented at the Annual Meeting of the Maryland Polygraph Association. Annapolis Junction, MD.
- Vendemia, J.M.C., Meek, S. W., Schillaci, M. J. (July, 2006). Neuroscientific Techniques of Studying Human Deception. Paper presented at the Annual Meeting of the American Polygraph Association. Las Vegas, NV.
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P., & Meek, S. W. ERP and fMRI Research in the Detection of Deception. Talk presented at the U.S. Army Research Laboratory Seminar on the Deception of Deception. Aberdeen, MD. (April, 2006)
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P., & Meek, S. W. Lie Detection Using EEG and ERP. Talk presented during Reading Minds: Lie Detection, Neuroscience, Law, and Society Conference hosted by The Stanford School of Law, Stanford, CA.. (May, 2006)
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P., & Meek, S. W. Examining the Underlying Assumptions of Neuroscientific Tests of Deception. Talk presented at the Judicial Seminar on Emerging Issues in Neuroscience hosted by the Association for the Advancement of Science. Washington, D. C. (June, 2006).
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P. Practice Effects on ERP-Components Related to Deceptive Responses: 12th annual Cognitive Neuroscience Society meeting in New York, NY, April, 2005.
- Vendemia, J. M. C., Schillaci, M. J., Buzan, R. F., Green, E. P. A Two-Level Quantum Analysis of ERP Data for Mock-Interrogation Trials: 12th annual Cognitive Neuroscience Society meeting in New York, NY, April, 2005.
- Schillaci, M. J., Vendemia, J. M. C., Buzan, R. F., Green, E. P., Modeling Deception as a Quantum Two-State System: DecDet Annual Meeting, Georgetown University, November, 5-6, 2004
- Schillaci, M. J. Deception and Truth as a Two-Level Construct: University of South Carolina, Research Showcase, Department of Psychology, August 2004.
- Schillaci, M. J. Computational Physics in a Nutshell: SESAPS 01, Charlottesville, VA, November 5, 2001
- Schillaci, M. J. Local Momenta and a Three-Body Gauge: SESAPS 99, Chapel Hill, North Carolina, November 9, 1999. (LE.07)
- Schillaci, M. J. Computational Physics on a Shoestring Budget: SESAPS 99, Chapel Hill, North Carolina, November 9, 1999. (Poster JF.24)
- Three Particles... What's the Problem?: Francis Marion University, Florence, SC. Thursday, September 23, 1999.
- Schillaci, M. J. A New Three-Body Wavefunction for Continuum Atomic scattering: DAMOP 98, Sante Fe, New Mexico, May 27, 1998. (Poster DP.94.)
- Schillaci, M. J. Electron-Paramagnetic Resonance Spectra of Organic Free Radicals Absorbed on Porous Silica: Sigma Xi Undergraduate Research, Geneva, New York. (1992)

Professional References

- **Dr. Peter A. Cardegna, Assistant Chairman**
Department of Physics
Rochester Institute of Technology
Phone: (585) 475-2421
Email: pacsps@rit.edu
- **Dr. Timothy A. Mousseau, Associate Dean**
College of Arts and Sciences
University of South Carolina
Phone: (803) 777-1936
Email: mousseau@sc.edu
- **Dr. David M. Peterson, Department Chairman**
Department of Physics and Astronomy
Francis Marion University
Phone: (843) 661-1445
Email: dpeterson@fmarion.edu
- **Dr. John E. Richards, Interim Department Chairman**
Department of Psychology
University of South Carolina
Phone: (803) 777- 4137
Email: richards-john@sc.edu
- **Dr. Surendra Singh, Department Chairman**
Department of Physics and Astronomy
University of Arkansas, Fayetteville
Phone: (479) 575-5930
Email: ssingh@uark.edu