

# Stephen Michael LaConte, Ph.D.

Associate Professor  
Virginia Tech Carilion Research Institute and  
Biomedical Engineering and Mechanics  
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## EDUCATION

- 9/96 - 9/02 University of Minnesota Minneapolis, MN
- Biomedical Engineering, Ph.D. (Electrical Engineering minor)
  - Co-Advisors: Xiaoping Hu and Stephen Strother
  - Thesis: Optimal basis representations for functional magnetic resonance imaging data
- 9/92 - 6/96 University of Denver Denver, CO
- Bachelor of Science in Electrical Engineering (BSEE)
  - 33 elective quarter hours of chemistry and biology

## PROFESSIONAL EXPERIENCE

### ACADEMIC

- |                |  |   |
|----------------|--|---|
| 1/11 - present | Virginia Tech Carilion Research Institute<br>Virginia Tech<br>Roanoke, VA  | Associate Professor<br>(Primary Appointment)              |
| 1/11 - present | Department of Biomedical Engineering and Mechanics<br>School of Biomedical Engineering and Sciences<br>Virginia Tech<br>Blacksburg, VA | Associate Professor<br>(Primary Tenure-Track Appointment) |
| 6/15 - present | Faculty of Health Sciences<br>Virginia Tech<br>Roanoke, VA   | Associate Professor                                       |
| 6/15 - present | Department of Radiology<br>Virginia Tech Carilion School of Medicine<br>Roanoke, VA  | Associate Professor                                       |
| 6/15 - present | Department of Emergency Medicine<br>Virginia Tech Carilion School of Medicine<br>Roanoke, VA   | Associate Professor                                       |
| 1/14 - 6/15    | Faculty of Health Sciences<br>Virginia Tech<br>Roanoke, VA   | Assistant Professor                                       |
| 8/12 - 6/15    | Department of Radiology<br>Virginia Tech Carilion School of Medicine<br>Roanoke, VA  | Assistant Professor                                       |

12/11 - 6/15	Department of Emergency Medicine Virginia Tech Carilion School of Medicine Roanoke, VA	Assistant Professor
5/11 - 6/15	Research Service Line Salem VA Medical Center Salem, VA	Research Health Scientist
1/11 - 6/15	School of Biomedical Engineering and Sciences Virginia Tech Blacksburg, VA	Assistant Professor
1/11 - 6/15	Virginia Tech Carilion Research Institute Virginia Tech Roanoke, VA	Assistant Professor
8/10 - 5/11	Research Service Line Michael E. DeBakey VA Medical Center Houston, TX	Research Health Scientist
10/09 - 12/10 (Adjunct: 1/11 - 6/14)	Structural and Computational Biology and Molecular Biophysics Graduate Program Baylor College of Medicine Houston, TX	Assistant Professor
6/09 - 6/10	Scientific and Statistical Computing Core National Institute of Mental Health Bethesda, MD	Special Volunteer
7/07 - 12/10	Department of Bioengineering Rice University Houston, TX	Adjunct Assistant Professor
7/07 - 12/10 (Adjunct: 1/11 - 6/14)	Department of Neuroscience Baylor College of Medicine Houston, TX	Assistant Professor
10/04 - 6/07	Department of Biomedical Engineering Georgia Institute of Technology / Emory University Atlanta, GA	Assistant Professor Research Track
4/02 - 10/04	Department of Biomedical Engineering Georgia Institute of Technology / Emory University Atlanta, GA	Research Associate

**NON-ACADEMIC**

3/98 - 4/99	Guidant Corporation Cardiac Pacemakers, Inc. St. Paul, MN	Engineering Internship/ Contractor
9/95 - 8/96	National Renewable Energy Laboratory Golden, CO	American Western Universities Undergraduate Research Fellow

## AWARDS

### PROFESSIONAL AWARDS

**2014** Virginia Tech College of Engineering 2014 Dean's Award for Outstanding New Assistant Professor.

**2013** ScienceDirect Top25. Our GPU article ranked 1st for *Medical Image Analysis*, July to September.

**2012** Scholar of the Week, Virginia Tech.

**2011** Kavli Fellow (National Academy of Sciences, Chinese-American Frontiers of Science).

**2011** NeuroImage Editors' Choice for "Decoding fMRI brain states in real-time." *NeuroImage*, 56:440-54, 2011.

**2006** "Best Prediction of All Categories." Pittsburgh Brain Activity Interpretation Competition. In the PBAIC06, human volunteers watched movie clips during fMRI scans. The volunteers were instructed to rate movie clips on a spectrum of 28 characteristics (settings, characters, amusement level, faces, etc.). The competition's goal was to build predictive models capturing the relationships between the imaging data and the stimulus descriptor set. Awards were presented at the Organization for Human Brain Mapping Conference on June 15, 2006 in Florence, Italy.

### POSTDOCTORAL AWARDS

**2004** Travel Grant Award ISMRM 2004 conference

**2003** Travel Grant Award ISMRM 2003 conference

### GRADUATE AWARDS

**2000** University of Minnesota's EMBS symposium poster competition

**2000** Travel Grant Award ISMRM 2000 conference

### UNDERGRADUATE AWARDS

**1996** IEEE Student Paper Competition (First Place in Region 5 Competition - see Publications)

**1996** NASA Scholar (Only invited undergraduate symposium presentation)

**1996** University of Denver Pioneer Award (1 of 10 seniors recognized by yearbook for demonstrating campus leadership and involvement)

## AFFILIATIONS

- BMES (Biomedical Engineering Society)
- EMBS (Engineering in Medicine and Biology Society) through IEEE
- IEEE (Institute of Electrical and Electronics Engineers)
- ISMRM (International Society for Magnetic Resonance Research)
- OHBM (Organization for Human Brain Mapping)
- SfN (Society for Neuroscience)

## LICENSES

- Engineer-Intern in state of Colorado. Passed Fundamentals of Engineering exam (April 1996).

## PATENTS

Title: Magnetic resonance eye tracking systems and methods

Inventors: LaConte, SM, Peltier, S, Heberlein K, Hu X

Owner: Emory University

Status: Provisional patent filed April 21, 2006

PCT filed April 23, 2007

## SOFTWARE

3dsvm: C-language program for support vector machine (SVM) analysis of functional magnetic resonance imaging (fMRI) data as described in (LaConte et al., 2005). 3dsvm is a wrapper for SVM- Light. It exists as a command line program and plugin for AFNI, which is a suite of neuroimaging software tools that is maintained and developed by the Scientific and Statistical Computing Core at the National Institute of Mental Health. <http://www.lacontelab.org/3dsvm.html>.

Real-Time fMRI: Using a real-time fMRI interface to 3dsvm, our rtfMRI system is integrated with the Siemens MRI software platform. Software and hardware development on Siemens equipment is enabled legally through a master research agreement (MRA). There are three ways that a researcher's developments can be disseminated - other groups can implement it independently, Siemens can implement it, or the PI can distribute it through a "C2P" legal licensing agreement. The C2P (for Core Competency Partner) provides protections that are important to Siemens and are generally beneficial to all parties, including a license for binaries only, restrictions to research (no clinical use), no commercial use, protection of Siemens and University, an "as is" clause, etc. The C2P is well supported and will be our primary strategy for sharing with other Siemens sites. For other sites (e.g. GE and Philips) we provide well-documented software examples to assist sites in writing an interface function on their scanner. The translation function will also be flexible in its communication with the main TABS functionality. To date, we have shared our Siemens code with two academic sites, and we have helped to port our technology to both a GE site and a Philips site.

## INVITED TALKS

- "Machine learning with fMRI data," NIH (Emotion and Development Branch, NIMH), Bethesda, MD, August 6, 2015.
- "Sampling rare events in the state space dynamics of resting state networks," Fourth Biennial Conference on Resting State Brain Connectivity, Boston/Cambridge, MA, USA. September 11, 2014.
- "Predicting intrinsic brain activity," The 2nd Whistler scientific workshop on brain functional organization, connectivity and behavior, Whistler-Blackcomb, British Columbia, Canada. March 11, 2014.
- "Supervised learning for the analysis of functional magnetic resonance imaging data," Department of Statistics Colloquium Speaker Series, Virginia Tech, Blacksburg, VA. November 7, 2013.
- "Brain computer interfaces increase whole-brain signal-to-noise," Janelia Farms Seminar (Hosted by Karel Svoboda), HHMI's Janelia Farm Research Campus, Ashburn, VA. November 4, 2013.
- "Keynote Talk: Supervised learning for the analysis of functional magnetic resonance imaging," Inaugural Translational Biology Medicine and Health (TBMH) Visiting Student Reception, Inn at Virginia Tech, Blacksburg, VA. November 1, 2013.
- "Sampling rare events in the state space dynamics of resting state networks," Virginia Tech Carilion Research Institute European-U.S. Workshop on Neuroscience of Cognition, Computation and Decisions. Riva San Vitale, Switzerland. October 18, 2013.

- “Sampling rare events in the state space dynamics of resting state networks,” Workshop on Engineering Systems for Mental Health (Organized by Srinivas Tadigadapa and Steven Schiff), Pennsylvania State University, University Park, PA. October 14, 2013.
- “Technological perspective: Pattern-based rtfMRI,” Radcliffe Symposium on Optimizing Real Time fMRI for Neurotherapeutic Discovery and Development (Organized by Luke Stoeckel and Eden Evins), Radcliffe Institute for Advanced Study, Harvard University, Cambridge, MA. July 11, 2013.
- “Directly testing the roles of resting-state networks with real-time fMRI,” OHBM Morning Workshop: Understanding the basis of resting-state fMRI connectivity dynamics (Organized by Daniel A. Handwerker and Catie Chang), Seattle, WA. June 17, 2013.
- “Using fMRI to track the time course of recovery from mild TBI,” Advanced Technologies and New Frontiers in Brain Injuries and Biomechanics, Arlington, VA. April 3, 2013.
- “Reading your mind: How to decode the brain mid-thought,” Roanoke-Blacksburg Technology Council, Tech and Toast, Blacksburg, VA. March 21, 2013.
- “Brain computer interfaces increase whole-brain signal-to-noise,” City College of New York, Department of Psychology, Neuroscience Colloquium, New York, NY. March 12, 2013.
- “Brain computer interfaces increase whole-brain signal-to-noise,” Martinos Center BrainMap Seminar, Athinoula A. Martinos Center, MGH, Boston, MA. January 9, 2013.
- “Brain computer interfaces increase whole-brain signal-to-noise,” VTCRI seminar series, Roanoke, VA. October 5, 2012.
- “Directly testing the roles of resting-state networks with real-time fMRI,” Third Biennial Conference on Resting State Brain Connectivity, Magdeburg, Germany. September 6, 2012.
- “Interfacing with the brain through real-time fMRI,” Imaging at Illinois: The Next Generation, Beckman Institute for Advanced Science and Technology, University of Illinois at Urbana-Champaign, June 1, 2012.
- “Keynote Lecture: Neurofeedback increases whole-brain signal-to-noise,” 1st Swiss Real Time fMRI Neurofeedback Conference, Eidgenössische Technische Hochschule (ETH), Zürich, Switzerland, February 17, 2012.
- “Interfacing with the brain through real-time fMRI,” Fourteenth Annual Chinese-American Kavli Frontiers of Science Symposium, Shenzhen, China, November 7, 2011.
- “Keynote Lecture: Enhancing supervised learning-based realtime fMRI,” IEEE International Workshop on Pattern Recognition in NeuroImaging, Seoul, Korea, May 17, 2011.
- “Temporally adaptive brain state fMRI,” Neuroimaging Technologies for Optimizing Performance, Alexandria, VA. September 24, 2010.
- “Real-time tracking of resting-state networks,” Second Biennial International Conference on Resting-State Connectivity, Milwaukee, WI. September 16, 2010.
- “Using machine learning of fMRI-based brain states to provide real-time neurofeedback,” CNS\*2010 Workshop on Methods of Information Theory in Computational Neuroscience, San Antonio, TX. July 30, 2010.
- Invited participant in “Engineering Brain Functions Session,” US - Europe Workshop, Reverse Engineering of the Human Brain, Dubrovnik, Croatia, May 23-26, 2010.
- “Using machine learning of fMRI-based brain states to provide real-time neurofeedback,” ISMRM Brain Function Study Group, Stockholm, Sweden, May 4, 2010.
- “Using machine learning of fMRI-based brain states to provide real-time neurofeedback,” Virginia Tech, Blacksburg, VA. April 22, 2010.

- “Real-time fMRI and feedback stimuli,” Winter Conference on Brain Research, Panel Session: Making Sense of Multisensory Integration, with Paul Laurienti and Michael Beauchamp (Organizer, Panel Chair), Breckenridge, CO, January 25, 2010.
- “Supervised learning of fMRI-based brain states and real-time fMRI,” MIND Institute, Albuquerque, NM, September 28, 2009.
- “Neurofeedback of two motor functions using supervised learning-based real-time functional magnetic resonance imaging,” Annual International Conference of the IEEE EMBS, Minneapolis, MN. September 6, 2009.
- “Using distributed fMRI patterns to track learning and provide real-time feedback,” Rotman Rounds, Baycrest’s Rotman Research Institute, Toronto, Ontario, Canada, February 23, 2009.
- “Detecting nonlinear dynamics of functional connectivity,” Resting-state workshop. Otto von Guericke University, Magdeburg, Germany. December 5, 2008.
- “Distributed and localized approaches to real-time fMRI,” Department of Psychology Cognitive Tea Seminar, Rice University, Houston, TX. September 3, 2008.
- “Using machine learning to enhance the capabilities of functional magnetic resonance imaging,” Institute for Human and Machine Cognition (IHMC). Pensacola, FL. June 6, 2008.
- “Brain reading and rehabilitation with fMRI,” National VA Research Week Symposium, Michael E. DeBakey VA Medical Center, Houston, TX. May 14, 2008.
- “New frontiers in neuroimaging,” Eighteenth Annual Rush and Helen Record Neuroscience Forum, Galveston TX. February 17, 2008.
- “Using machine learning to enhance the capabilities of functional magnetic resonance imaging,” Fifth Annual Houston Conference on Theoretical and Computational Neuroscience, Rice University, Houston, TX. January 12, 2008.
- “Using machine learning to enhance the capabilities of functional magnetic resonance imaging,” Functional MRI 2007 Speaker Series, University of Michigan, Ann Arbor, MI. October 27, 2007.
- “Real-time feedback and other enhancements to fMRI using multi-voxel pattern analysis,” Bernstein Center for Computational Neuroscience, Humboldt University, Berlin Germany May 18, 2007.
- “Real-time feedback and other enhancements to fMRI using multi-voxel pattern analysis,” Neuroimaging Analysis Methods Group, Center for the Study of Brain, Mind, and Behavior (CSBMB). Princeton University, Princeton, NJ. May 11, 2007.
- “Enhancing functional magnetic resonance imaging with temporally predictive multivariate models,” Rice University, Department of Bioengineering, Houston TX. April 30, 2007.
- “Enhancing functional magnetic resonance imaging with temporally predictive multivariate models,” Yerkes Imaging Center. Yerkes National Primate Center of Emory University, Atlanta GA. March 7, 2007.
- “Enhancing functional magnetic resonance imaging with supervised learning,” NIPS 2006 Workshops: New directions on decoding mental states from fMRI data. Organized by John-Dylan Haynes, Francisco Pereira, Tom Mitchell. Whistler, Canada, December 8, 2006.
- “Real-time classification of brain states for adaptive fMRI experiments,” Baylor College of Medicine (Human Neuroimaging Laboratory), Houston, TX, September 22, 2006.
- “Real-time classification of brain states for adaptive fMRI experiments,” University of Pittsburgh Medical Center (Department of Radiology, MR Research Center), Pittsburgh, PA, September 18, 2006.
- “Real-time fMRI using multivariate brain state estimation,” NIH (Functional MRI Facility, DIRP, NIMH), Bethesda, MD, July 21, 2006.

- “Imaging brain states in real-time for adaptive fMRI experiments,” Intel Opportunity Scholar’s Program and Partners in Transitioning to Tech (PITT), Georgia Institute of Technology, Atlanta GA. February 28, 2006.
- “Temporal classification of fMRI data,” MIND Institute, Albuquerque, NM. July 12, 2004.

## PEER REVIEW ACTIVITIES

### JOURNALS

Human Brain Mapping; IEEE Transactions on Medical Imaging; IEEE Transactions on Systems, Man, and Cybernetics–Part C: Applications and Reviews; Journal of Magnetic Resonance; Journal of Magnetic Resonance Imaging; Nature Neuroscience; Nature Reviews Neuroscience; Neural Networks; NeuroImage; Trends in Cognitive Sciences; PLOS ONE

### BOOKS

- Kernel Methods in Bioengineering, Signal and Image Processing. 2007. Gustavo Camps-Valls, José Luis Rojo-Álvarez, and Manel Martínez-Ramón, editors.

### CONFERENCES

- Annual meeting of the Biomedical Engineering Society (BMES 2015)
- Annual meeting of the Biomedical Engineering Society (BMES 2014)
- 19th annual meeting of the Organization for Human Brain Mapping (HBM13)
- Annual meeting of the Biomedical Engineering Society (BMES 2012)
- 15th annual meeting of the Organization for Human Brain Mapping (HBM09)
- 17th annual meeting of the International Society for Magnetic Resonance in Medicine (ISMRM09)
- 14th annual meeting of the Organization for Human Brain Mapping (HBM08)
- 13th annual meeting of the Organization for Human Brain Mapping (HBM07)
- 21st IEEE Canadian Conference on Electrical and Computer Engineering (IEEE CCECE08)
- 3rd Cairo International Biomedical Engineering Conference co-sponsored by IEEE EMBS (CIBEC06)
- 28th Annual International Conference of the IEEE EMBS (EMBC06)
- 11th International Conference on Neural Information Processing (ICONIP-2004)

### FUNDING AGENCIES

- New Jersey Commission on Spinal Cord Research Independent Scientific Merit Review Panel, April 13, 2015.
- National Cancer Institute (NCI) Special Emphasis Panel - Fundamental Mechanisms of Affective and Decisional Processes in Cancer Control, January 29, 2015.
- National Institute on Drug Abuse (NIDA) Cutting-Edge Basic Research Awards (CEBRA) ZDA SXC-E (12) December 2, 2011.
- National Institute on Drug Abuse (NIDA) Cutting-Edge Basic Research Awards (CEBRA) program March 14-17, 2011.
- National Institute on Drug Abuse (NIDA) Small Business Innovation Research (SBIR) N43DA-10-4413 January 12, 2011.

- National Institute of Nursing Research Special Emphasis Panel (Informed-decision making in young adolescent at-risk for HIV/AIDS) ZNR1 REV-M(06) November 2, 2010.
- Israel Science Foundation (ISF) Focal Initiatives in Research in Science and Technology Program. 2009.
- National Institute of Health (NIH) Special Emphasis Panel (Behavioral pharmacology and genetics: Translating and targeting individual differences) ZDA1 SXC-E(03) June 4, 2009.
- National Institute of Health (NIH) Special Emphasis Panel ZDA1 KXH-C(40) January 17, 2008.
- National Institute of Health (NIH) Special Emphasis Panel (Neuroinformatics/Imaging) MDCN-K(51) March 14-15, 2006.
- National Institute of Health (NIH) Special Emphasis Panel (Human Brain Project/Neuroinformatics) MDCN-K(55) June 22, 2005.

## SERVICE

### PROFESSIONAL

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|----------------|---|
| 2015           | Biomedical Engineering Society, October 8, Session Chair, Magnetic Resonance Imaging.   |
| 2014           | Biomedical Engineering Society, October 23, Poster Session Chair, Magnetic Resonance Imaging.   |
| 2014           | Fourth Biennial Conference on Resting State Brain Connectivity, September 11-13, Cambridge, MA, Abstract Committee.   |
| 2013           | Organization for Human Brain Mapping, June 18, Seattle, Chair, Modeling and Analysis Methods 2: Functional Modeling.  |
| 2012           | Biomedical Engineering Society, October 25, Atlanta, Co-chair (with Shella Keilholz), Magnetic Resonance Imaging session.   |
| 2012           | Third Biennial Conference on Resting State Brain Connectivity, September 5-7, Magdeburg, Germany, Abstract Committee.   |
| 2012           | Organization for Human Brain Mapping (OHBM2012). Brain-Computer Interfaces and Real-Time fMRI Educational Session Organizer (with Rainer Goebel). Beijing, China. June 10.                      |
| 2012 - present | Editorial Board of NeuroImage.  |
| 2012 - present | Reviewing Editor for Frontiers in Brain Imaging Methods.  |
| 2012           | 2nd International Workshop on Pattern Recognition in Neuroimaging, July 2-4, University College London, Program Committee.  |
| 2009           | Annual International Conference of the IEEE Engineering in Medicine and Biology Society (31st EMBC09). Functional imaging track co-chair (with Hae-Jeong Park). Minneapolis, MN. September 2-6. |
| 2005           | IEEE Teacher's in-service training session for promoting science and engineering for K-12 education. Sponsored by the IEEE Educational Activities Region 3, Atlanta, GA. July 23.               |

### VIRGINIA TECH

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|----------------|---|
| 2016           | Faculty steering committee on the "Information and Decision Sciences" destination area.   |
| 2015 - present | Neuroscience Initiative Faculty Search Committee.   |
| 2015           | ICTAS Seed Proposals JFC BioMed/Health Peer Review Panel  |
| 2015 - present | VTCSOM M4 Written and Oral Presentation Evaluations.  |
| 2014 - present | BME Undergraduate Curriculum Committee  |
| 2014           | Virginia Science Festival, October 11, VTCRI, rtfMRI Brain-Controlled Robotic Vehicle (with Alex Leonessa and Rosalyn Moran). <a href="http://research.vtc.vt.edu/sciencefestival2014/">http://research.vtc.vt.edu/sciencefestival2014/</a> . |
| 2014           | Presidential Installation of Timothy Sands, 16th President of Virginia Tech. October 18, Panel discussion: Harnessing Brain Power.  |
| 2014           | SBES Biomechanics Faculty Search Committee.   |
| 2013 - present | VTCSOM M1 Written and Oral Presentation Evaluations.  |



2013 - present	VTCSOM M2 Oral Presentation Evaluations.
2013 - present	VTCRI Seminar Program Committee 2013-2014, 2014-2015.
2013	Pilot research grant reviewer: Collaborative inter-institutional projects fostering collaboration between Virginia Tech, Children's National Medical Center, and George Washington University.
2011	Virginia Tech Carilion Research Institute, Faculty Search Committee (member).
2011 - present	SBES Qualifying Exam Faculty Examiner.
2011 - present	SBES Graduate Recruiting Weekend (MRI demonstrations)
2011	Virginia Tech Carilion Research Institute, Institute Integration Committee (member).
2011	Virginia Tech Carilion Research Institute, Computing Resources Committee (member).

## **BAYLOR COLLEGE of MEDICINE**

2010	Baylor College of Medicine, IT Governance Advisory Committee (research subcommittee member).
2009	Baylor College of Medicine, Department of Neuroscience, Departmental ad hoc committee to develop seminar series policies.
2007 - 2010	Baylor College of Medicine, Department of Neuroscience, Graduate Student Admissions Committee (member).
2007 - 2008	Baylor College of Medicine, Department of Neuroscience, Cognitive Neuroscience Faculty Search Committee.
2007 - 2008	Baylor College of Medicine, Department of Neuroscience, Departmental ad hoc committee to help define competencies in quantitative skills.

## **EMORY UNIVERSITY**

2005	North American IDEA User's Meeting, Co-sponsored by Emory University and Siemens Medical Solutions, November 4-6, Atlanta, GA. Planning Committee.
2002 - 2003	Passages Structured mentoring program for faculty at Emory University. Mentored by Jim Snyder Department of Chemistry.

## **TEACHING**

### **COURSES**

- "Medical Imaging" Virginia Tech / Wake Forest, Course Number: BMES-6514 / BMES-751, Spring Semester 2016 (approximately 25% of course, 7 Lectures on MRI).
- "Special Study: Introduction to Biomedical Imaging" Virginia Tech, Course Number: BMES-4984 (Course Coordinator Guohua Cao), Fall Semester 2015 (approximately 25% of course, 7 Lectures on MRI).
- "Special Study: Introduction to Functional Magnetic Resonance Imaging" Virginia Tech, Course Number: BMES-5984, Fall Semester 2014, 2015.
- "Neuroimaging," Baylor College of Medicine, Course Number: 350-444 Brain Imaging from Cell to System (Course Coordinator Peter Saggau), March 17-May 7, 2009 (entire second term - approximately 24 lecture hours).
- "Data representation, spectral methods, and classification techniques," Baylor College of Medicine, Course Number: 350-425, Introduction to statistical computing and modeling (Course Coordinator: Read Montague), March 3-14, 2008 (approximately 6 lecture hours).

**COURSE LECTURES**

- “Introduction to MRI” Virginia Tech, CHEM 4524/5524, Molecular Structure Determination (Instructor: Harry Dorn), November 5, 2015.
- “Grant, P. E., et al. Increased cerebral blood volume and oxygen consumption in neonatal brain injury. *Journal of Cerebral Blood Flow and Metabolism*, 2012” Virginia Tech, School of Medicine and TBMH, Methods in Logic (Instructor: Leslie LaConte), October 14, 2015.
- “Research Live! (Introductory lecture to research and available projects in my lab),” Virginia Tech Carilion School of Medicine, M1 Research Domain, August 7, 2015.
- “Whitmer et al. High frequency deep brain stimulation attenuates subthalamic and cortical rhythms in Parkinson’s disease. *Frontiers in Human Neuroscience*, 2012” Virginia Tech, School of Medicine and TBMH, Methods in Logic (Instructor: Leslie LaConte), April 1, 2015.
- “Introduction to real-time fMRI and its potential for addiction treatment” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Scott Verbridge), March 26, 2015.
- “Introduction to MRI” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Scott Verbridge), March 24, 2015.
- “Research Live! (Introductory lecture to research and available projects in my lab),” Virginia Tech Carilion School of Medicine, M1 Research Domain, January 30, 2015.
- “Introduction to real-time fMRI and its potential for addiction treatment” Virginia Tech, TBMH 5004, Translational Biology, Medicine, & Health (Instructor: Michael Friedlander), October 8, 2014.
- “fMRI pattern analysis and real-time fMRI” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Scott Verbridge), April 1, 2014.
- “Introduction to MRI” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Scott Verbridge), March 25, 2014.
- “Introduction to MRI” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Pam VandeVord), May 4, 2013.
- “Bioimaging” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Pam VandeVord), May 2, 2013.
- “Biomedical Imaging: MRI Basics” Virginia Tech, BMES 2894, Introduction to Biomedical Engineering (Instructor: Pam VandeVord), April 3, 2012.
- “Faculty panel discussion on manuscript publication,” Virginia Tech Carilion School of Medicine, M1 Research Domain, March 19, 2012.
- “MRI Basics: NMR to MRI,” Virginia Tech, GRAD 5134, Polymers in Medicine and Biology (Instructors: Judy Riffle and Abby Whittington), November 17 and 29, 2011 (2 lectures).
- “Advanced neuroimaging methods for functional characterization and rehabilitation,” CarilionClinic, Department of Emergency Medicine, Residency Program, September 29, 2011.
- “Research Live! (Introductory lecture to research and available projects in my lab),” Virginia Tech Carilion School of Medicine, M1 Research Domain, September 23, 2011
- “Supervised learning of fMRI-based cognitive states (and real-time fMRI),” University of Texas Graduate School of Biomedical Sciences, GS140053 (also listed as Rice University Bioengineering and Psychology 471/671), Introduction to fMRI (Instructor: Michael S. Beauchamp), November 30, 2010.
- “Neuroimaging crash course,” Rice University, PSYC 362, Biopsychology (Instructor: Timothy Ellmore), February 18, 2010.

- “Measurement of higher brain function in humans,” Baylor College of Medicine, Course 350-434, Higher Brain Function (Course Director: Mariella De Biasi), February 16, 2010.
- “Introduction to MR physics,” University of Texas Graduate School of Biomedical Sciences, GS140053 (also listed as Rice University Bioengineering and Psychology 471/671), Introduction to fMRI (Instructor: Michael S. Beauchamp), September 23, 2008.
- “Sampling and aliasing in image reconstruction,” Georgia Institute of Technology, BMED 8813, Special Topics on Magnetic Resonance Imaging (Instructor: Xiaoping Hu), September 28, 2004.
- “Continuous and discrete Fourier transforms,” Georgia Institute of Technology, BMED 8813, Special Topics on Magnetic Resonance Imaging (Instructor: Xiaoping Hu), September 23, 2004.
- “Imaging of Alzheimer’s disease with MRI,” Emory University, Chem 470 Chemistry, Biology, and Molecular Modeling (Instructor: Jim Snyder), February 26, 2003.

## **WORKSHOPS, TRAINING COURSES, AND INTERNATIONAL CONFERENCE EDUCATION**

- “Pattern Recognition and real-time fMRI,” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 11, 2015 (Evening Real-Time fMRI Demo at Michigan Scanner given on Aug 12; Data Analysis Lab and Demo given on Aug 13).
- “Pattern Recognition and real-time fMRI,” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 12, 2014 (Evening Real-Time fMRI Demo at Michigan Scanner given on Aug 13; Data Analysis Lab and Demo given on Aug 14).
- “Pattern Recognition and real-time fMRI,” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 15, 2012 (Lab and Demo given on Aug 16).
- “Multivoxel Pattern-Based rtfMRI,” Organization for Human Brain Mapping, Brain-Computer Interfaces and Real-Time fMRI, Educational Course, Beijing, China. June 10, 2012.
- “fMRI analysis,” International Society for Magnetic Resonance in Medicine, Sunrise Educational Course: Absolute Beginner’s Guide to Neuroimaging Methods, Melbourne, Australia. May 10, 2012.
- “fMRI in humans: Basic concepts and methods,” International Society for Magnetic Resonance in Medicine, Sunrise Educational Course - Clinical Intensive Course: Absolute Beginner’s Guide to Translational Neuroimaging, Melbourne, Australia. May 9, 2012.
- “A window into the brain: MRI anatomy from development through aging,” International Society for Magnetic Resonance in Medicine, Sunrise Educational Course - Clinical Intensive Course: Absolute Beginner’s Guide to Translational Neuroimaging, Melbourne, Australia. May 8, 2012.
- “Supervised learning of fMRI-based cognitive states (and real-time fMRI),” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 17, 2011 (Lab and Demo given on Aug 19).
- “Real-time fMRI,” NeuroImaging Training Program (NITP), The UCLA Advanced Neuroimaging Summer program, Los Angeles, California. July 19, 2011.
- “Real-time fMRI,” International Society for Magnetic Resonance in Medicine, Educational session: Advanced fMRI Techniques & Functional Connectivity Assessment Montreal, Canada. May 8, 2011.
- “Supervised learning of fMRI-based cognitive states (and real-time fMRI),” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 18, 2010.
- “Supervised learning of fMRI-based brain states and real-time fMRI,” PhD course: Advances in magnetic resonance imaging of human brain structure and function, Hvidovre Hospital, Copenhagen University, Denmark. October 8, 2009.

- “Supervised learning of fMRI-based cognitive states (and real-time fMRI),” University of Michigan training course in functional magnetic resonance imaging (fMRI). Ann Arbor, Michigan. August 19, 2009.
- “Classification of fMRI-based cognitive states using 3dsvm,” (approximately 3 lecture hours, including hands-on lab component), National Institute of Health Training - 935-09S - Advanced AFNI #5: Brain state classification using AFNI and FMRI datasets. Bethesda MD, July 22, 2009.
- “Brain imaging,” (joint lecture with Michael Beauchamp), NSF REU Undergraduate Summer Internship in Theoretical and Computational Neuroscience, Rice University-Texas Medical Center, Houston, TX. June 1, 2009.
- “FMRI pattern classification,” International Society for Magnetic Resonance in Medicine, FMRI Advanced Issues, Honolulu, HI. April 19, 2009.
- “Classification in real time,” International Society for Magnetic Resonance in Medicine, FMRI Advanced Issues, Honolulu, HI. April 19, 2009.
- “Classification of fMRI-based cognitive states,” Summer School: Mathematics in Brain Imaging, Institute for Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, CA. July 25, 2008.
- “Classifier analyses and prediction of mental states from brain activity,” Organization for Human Brain Mapping, Advanced fMRI Course, Melbourne, Australia. June 15, 2008.
- “Brain imaging,” NSF REU Undergraduate Summer Internship in Theoretical and Computational Neuroscience, Rice University-Texas Medical Center, Houston, TX. June 2, 2008.
- “FMRI research and data analysis,” (approximately 8 lecture hours), Beijing advanced fMRI educational workshop, Beijing, China, June 18-23, 2006.
- “fMRI data analysis: General concepts” Emory University, Biomedical Imaging Technology Center, Training Workshop, November 23, 2002.
- “Overview of fMRI data analysis” Minnesota Workshops fMRI Training Course, October 10, 2001.

## HIGH SCHOOL STUDENTS

- Mark Tenzer, Patrick Henry High and Roanoke Valley Governor’s School, 2014-present
- Sam McGhee, Patrick Henry High and Roanoke Valley Governor’s School, 2013-2014
- Araba Wubah, Blacksburg High School, 2011

## UNDERGRADUATE STUDENTS

- Sam McGhee, Virginia Tech, 2014-present
- Amnah Eltahir, Virginia Tech, 2013-2014
- Jonathan Ng, Rice/TMC/UH Computational Neuroscience REU, 2009
- Andrew Fischer, Rice University, 2008-2010
- Prashant Prasad, Rice University, 2007-2009

## GRADUATE STUDENTS

- Amnah Eltahir, Virginia Tech, School of Biomedical Engineering and Sciences, 2014-present
- Harshawardhan Deshpande, Virginia Tech, School of Biomedical Engineering and Sciences, 2012-present
- Katherine McRoberts, Virginia Tech, School of Biomedical Engineering and Sciences, 2011-2013.  
Thesis: “Magnetic Resonance Imaging Movies for Multivariate Analysis of Speech”  
MS Biomedical Engineering
- Cyrus Eierud, Baylor College of Medicine, Structural and Computational Biology and Molecular Biophysics (SCBMB), 2009-2014.  
Thesis: “Developing Neuroimaging Methods to Disentangle Mild Traumatic Brain Injury”  
PhD SCBMB

## MEDICAL STUDENTS

- Benjamin Stephens (Sharon Ramey, primary), Virginia Tech Carilion School of Medicine, 2014-present
- Juniper J. Lee Park (Stephanie DeLuca, primary), Virginia Tech Carilion School of Medicine, 2014-present
- Alisha Tuteja, Virginia Tech Carilion School of Medicine, 2013-present
- Amber Post, Virginia Tech Carilion School of Medicine, 2012-present
- Manek Aulakh, Virginia Tech Carilion School of Medicine, 2011-2014  
Project: “Acute sleep deprivation shows reversible effects on the multi-source interference task.”
- Sean R. Fletcher, Virginia Tech Carilion School of Medicine, 2011-2014  
Project: “Improved performance on the multi-source interference task, even during moderate alcohol intoxication.”

## POSTDOCTORAL

- Charles Mueller, 2013-2014
- Anders Eklund, 2012-2014
- Richard Cameron Craddock, 2009-2012
- Theodora Dorina Papageorgiou, 2007-2009
- Jihong Chen, 2005

## THESIS COMMITTEES

- Jade Montgomery (advised by Robert Gourdie), Virginia Tech, Biomedical Engineering and Mechanics (BEAM).
- Hao Gong (advised by Guohua Cao), Virginia Tech, Biomedical Engineering and Mechanics (BEAM).
- Joseph Sutlive (advised by Rolf Mueller), Virginia Tech, Translational Biology Medicine and Health (TBMH).
- Stephanie Roldan (advised by Anthony Cate), Virginia Tech, Psychology.
- Katherine McCurry (advised by Pearl Chiu and Brooks King-Casas), Virginia Tech, Psychology.
- Shaza Zaghlool (advised by Chris Wyatt), Virginia Tech, Electrical and Computer Engineering (ECE), PhD 2014.
- William Charles Vogt (advised by Christopher Rylander), Virginia Tech, School of Biomedical Engineering and Sciences (SBES), PhD 2013.

- Sujith V. Sajja (advised by Pamela VandeVord), Virginia Tech, School of Biomedical Engineering and Sciences (SBES), PhD 2013.
- Ting Xiang (advised by Read Montague), Baylor College of Medicine, Neuroscience, PhD 2013.
- Josepheen De Asis Cruz (advised by Read Montague), Baylor College of Medicine, Neuroscience, PhD 2013.
- Anders Eklund (PhD Thesis Opponent, April 27, 2012; advised by Hans Knutsson), Linköpings Universitet, Medical Informatics, Department of Biomedical Engineering Linköping Sweden, PhD 2012.
- Carlos Perez Torres (advised by Robia Pautler), Baylor College of Medicine, Translational Biology and Molecular Medicine (TBMM), PhD 2012.
- Temilade Adelere (advised by Eric Schumacher), Georgia Institute of Technology/Emory University, Master's thesis 2007.
- Christian Cabrera (advised by Krish Sathian), Emory University undergraduate. Undergraduate honors thesis 2006.

## RESEARCH GRANTS

### ACTIVE

Neural Correlates of Impulsive Choices of Risky Sex in Simulant Dependence (Micky Koffarnus, PI)

Role on Project: Co-Investigator

Funding Agency: NIDA/NIH (1R21DA040559)

Project Period: 9/2015 - 8/2017

Subcontract: Brain Mechanisms Supporting Individual Differences in Pain Sensitivity (Robert Coghill, PI)

Role on Project: Co-Investigator (Subcontract PI)

Funding Agency: NIH/NIMH (R01MH101555)

Subcontract Total Cost: \$108,630

Project Period: 7/2015 - 4/2020

Multisite RCT of 3 Neurorehabilitation Therapies for Infants with Asymmetrical CP (Sharon Ramey and Stephanie DeLuca, PIs)

Role on Project: Co-Investigator

Funding Agency: NIH (1R01HD074574)

Eunice Kennedy Shriver National Institute of Child Health & Human Development

Project Period: 3/2014 - 9/2017

Development and Testing of a Novel Neurotechnology to Promote Emotion Recognition in Autism (Susan White, PI)

Role on Project: Co-Investigator

Funding Agency: NIH/NIMH (1R21MH100268)

Project Period: 3/2014 - 2/2016

The repair of self control in alcohol dependence: Working memory and real-time fMRI

Role on Project: Co-Principal Investigator with Warren Bickel

Funding Agency: NIH/NIAAA (R01 AA02152901A1)

Estimated Total Cost: \$2,820,884

Project Period: 9/2013 - 5/2018

Subcontract: Real-time fMRI Neurofeedback Based Stratification of Default Network Regulation (Cameron Craddock, PI)

Role on Project: Co-Investigator (Subcontract PI)

Funding Agency: NIH/NIMH (R01MH101555)

Subcontract Total Cost: \$61,283

Project Period: 7/2013 - 5/2017

Mentorship and Development Program for Biomedical Trainees (Audra Van Wart & Michael Friedlander, PIs)  
Role on Project: Co-Investigator  
Funding Agency: NIH (DP7OD018428)  
Project Period: 9/2013 - 8/2018

Multisite RCT of 3 Neurorehabilitation Therapies of Infants with Asymmetrical CP (Sharon Ramey & Stephanie DeLuca, PIs)  
Role on Project: Co-Investigator  
Funding Agency: NIH (R01HD068345)  
Estimated Total Cost: \$2,992,184  
Project Period: 3/2014 - 2/2018

Development of a Novel Neurotechnology to Promote Emotion Recognition in Autism (Susan White, PI)  
Role on Project: Co-Investigator  
Funding Agency: NIH/NIMH (R21MH100268)  
Estimated Total Cost: \$494,912  
Project Period: 3/2014 - 2/2016

NCAA-DoD Concussion Advanced Research Core (Thomas McAllister, Steven Broglio, & Michael McCrea, PIs)  
Role on Project: Subcontract PI (with Stefan Duma and Steven Rowson)  
Funding Agency: DoD NCAA  
Subcontract Total Cost: \$651,513  
Project Period: Pending

## **AWARDED**

Neuroimaging major depression and nicotine dependence on axes of valuation (Pearl Chiu, PI)  
Role on Project: Co-Investigator  
Funding Agency: NIMH (7R01MH087692)  
Project Period: 9/2012 - 1/2015  
National Institute of Mental Health

Neurofeedback for default mode network regulation in major depressive disorder (Cameron Craddock, PI)  
Role on Project: Co-Mentor with Helen Mayberg  
Funding Agency: NARSAD Young Investigator Award  
Total Cost: \$60,000  
Project Period: 7/2011 - 6/2013

The biological and behavioral bases for decision-making in medical professionals (Read Montague, PI)  
Role on Project: Co-Investigator  
Funding Agency: NIA (RC4AG039067)  
Project Period: 5/2011 - 8/2013  
National Institute on Aging

Neuroimaging major depression and nicotine dependence on axes of valuation (Pearl Chiu, PI)  
Role on Project: Co-Investigator  
Funding Agency: NIMH (7R01MH091872)  
Project Period: 4/2011 - 1/2015  
National Institute of Mental Health

Localized and distributed real-time fMRI approaches to facilitate self control in substance abusers  
Role on Project: Co-Principal Investigator with Pearl Chiu  
Funding Agency: NIH/NIDA (R33DA026086)  
Total Cost: \$1,722,696  
Project Period: 9/2010 - 6/2013

Neurobehavioral metrics for the assessment and treatment of depression (Pearl Chiu, PI)

Role on Project: Co-Investigator

Funding Agency: NIH/NIMH (R01MH087692)

Estimated Total Cost: \$926,154

Project Period: 7/2010 - 3/2015

Neurobehavioral assessment of interpersonal functioning in PTSD (Brooks King-Casas, PI)

Role on project: Co-Investigator

Funding Agency: VA/RR&D (D7030R)

Project Period: 10/2009 - 9/2013

Veterans Affairs Office of Rehabilitation Research and Development

Enhancing 3dsvm to improve its interoperability and dissemination

Role on Project: Principal Investigator

Funding Agency: NIH/NIBIB (R03EB012464)

Total Cost: \$156,500

Project Period: 9/2010 - 9/2011

Mission Connect mild TBI translational research consortium.

Role on Project: consortium PI (Initiating PI: Alex Valadka)

Funding Agency: US Army Medical Research and Materiel Command (W81XWH-08-2-0144)

Total Cost: \$534,650

Project Period: 8/2008 - 7/2013

Localized and distributed real-time fMRI approaches to facilitate self control in substance abusers

Role on Project: Co-Principal Investigator with Pearl Chiu

Funding Agency: NIH/NIDA (R21DA026086)

Total Cost: \$399,270

Project Period: 9/2008 - 8/2010

Speech rehabilitation with fMRI-based biofeedback.

Role on Project: PI (with Read Montague)

Funding Agency: McNair Foundation

Total Cost: \$1,450,000

Project Period: 7/2007 - 6/2009

Assessing Development Effects of Prenatal Cocaine Exposure (Xiaoping Hu, PI)

Role on project: Investigator

Funding Agency: NIDA (R01DA17795)

Project Period: July 15, 2004 - April 30, 2009

National Institute on Drug Abuse

Improvement and Application of fMRI (Xiaoping Hu, PI)

Role on project: Investigator

Funding Agency: NINDS (R01EB002009)

Project Period: May 1, 2000 - Mar. 31, 2009

National Institute of Neurological Disorders and Stroke

Temporally Adaptive fMRI.

Role on Project: Principal Investigator

Funding Agency: NINDS (R21NS050183)

Total Cost: \$378,569

Project Period: Jan. 1, 2005 - Dec. 31, 2006

National Institute of Neurological Disorders and Stroke



Application of multivariate support vector pattern recognition classification methods to detect and predict neural correlates of emotion.

Role on Project: Co-Investigator (with Stephan Haman, PI and Carla Nolan, Co-PI)

Funding Agency: Emory College FMRI Seed Grant Application

Total Cost: \$22,000

Project Period: 9/2004 - 9/2005

## PUBLICATIONS

Google Scholar

Citations: 2449

h-index: 25

## PEER-REVIEWED ARTICLES

41. White, S., Richey, J., Gracanin, D., Bell, M., LaConte, S., Coffman, M., Trubanova, A., and Kim, I. The promise of neurotechnology in clinical translational science. *Clinical Psychological Science*, 3:797–815, 2015.
40. Li, T., Murphy, S., Kiselev, B., Bakshi, K. S., Zhang, J., Eltahir, A., Zhang, Y., Chen, Y., Zhu, J., Davis, R. M., et al. A new interleukin-13 amino-coated gadolinium metallofullerene nanoparticle for targeted MRI detection of glioblastoma tumor cells. *Journal of the American Chemical Society*, 137(24):7881–7888, 2015.
39. Idelson, C. R., Vogt, W. C., King-Casas, B., LaConte, S. M., and Rylander, C. G. Effect of mechanical optical clearing on near-infrared spectroscopy. *Lasers in Surgery and Medicine*, 47(6):495–502, 2015.
38. Zuo, X.-N., Anderson, J., Bellec, P., Birn, R., Biswal, B., Blautzik, J., Breitner, J. C., Buckner, R., Calhoun, V., Castellanos, F., et al. An open science resource for establishing reliability and reproducibility in functional connectomics. *Scientific Data*, 1, 2014.
37. Stoeckel, L., Garrison, K., Ghosh, S., Wighton, P., Hanlon, C., Gilman, J., Greer, S., Turk-Browne, N., Scheinost, D., Craddock, C., et al. Optimizing real time fMRI neurofeedback for therapeutic discovery and development. *NeuroImage: Clinical*, 5:245–255, 2014.
36. Eklund, A., Dufort, P., Villani, M., and LaConte, S. BROCCOLI: Software for fast fMRI analysis on many-core CPUs and GPUs. *Frontiers in Neuroinformatics*, 8, 2014.
35. Zhang, J., Ye, Y., Chen, Y., Pregot, C., Li, T., Balasubramaniam, S., Hobart, D., Zhang, Y., Wi, S., Davis, R., Madsen, L., Morris, J., LaConte, S., Yee, G., and Dorn, H. Gd<sub>3</sub>n@c84(oh)x: A new egg-shaped metallofullerene magnetic resonance imaging contrast agent. *Journal of the American Chemical Society*, 136:2630–2636, 2014.
34. Eierud, C., Craddock, C., Fletcher, S., Aulakh, M., King-Casas, B., Kuehl, D., and LaConte, S. Neuroimaging after mild traumatic brain injury: Review and meta-analysis. *NeuroImage: Clinical*, 4:283–294, 2014.
33. Papageorgiou, T., Lisinski, J., McHenry, M., White, J., and LaConte, S. Brain-computer interfaces increase whole-brain signal-to-noise. *Proceedings of the National Academy of Science (USA)*, 110:1360–1365, 2013.
32. Craddock, C., Milham, M., and LaConte, S. Predicting intrinsic brain activity. *NeuroImage*, 82:127–136, 2013.
31. Eklund, A., Dufort, P., Forsberg, D., and LaConte, S. Medical image processing on the GPU - past, present and future. *Medical Image Analysis*, 17:1073–1094, 2013.
30. Sulzer, J., Haller, S., Scharnowski, F., Weiskopf, N., Birbaumer, N., Blefari, M., Bruehl, A., Cohen, L., Decharms, R., Gassert, R., Goebel, R., Herwig, U., LaConte, S., Linden, D., Luft, A., Seifritz, E., and Sitaram, R. Real-time fMRI neurofeedback: Progress and challenges. *NeuroImage*, 76:386–399, 2013.
29. Eklund, A., Villani, M., and LaConte, S. Harnessing graphics processing units for improved neuroimaging statistics. *Cognitive, Affective, and Behavioral Neuroscience*, 13:587–597, 2013.

28. Yang, Z., Zuo, X.-N., Wang, P., Li, Z., LaConte, S. M., Bandettini, P. A., and Hu, X. P. Generalized RAICAR: Discover homogeneous subject (sub)groups by reproducibility of their intrinsic connectivity networks. *NeuroImage*, 63:403–414, 2012.
27. Chiew, M., LaConte, S. M., and Graham, S. J. Investigation of fMRI neurofeedback of differential primary motor cortex activity using kinesthetic motor imagery. *NeuroImage*, 61:21–31, 2012.
26. Sathian, K., Lacey, S., Stilla, R., Gibson, G. O., Deshpande, G., Hu, X., LaConte, S., and Glielmi, C. Dual pathways for haptic and visual perception of spatial and texture information. *NeuroImage*, 57:462–475, 2011.
25. LaConte, S. M. Decoding fMRI brain states in real-time. *NeuroImage*, 56:440–54, 2011.
24. Williams, K. A., Magnuson, M., Majeed, W., LaConte, S. M., Peltier, S. J., Hu, X., and Keilholz, S. D. Comparison of a-chloralose, medetomidine and isoflurane anesthesia for functional connectivity mapping in the rat. *Magnetic Resonance Imaging*, 28:995–1003, 2010.
23. McHenry, M. A. and LaConte, S. M. Computer speech recognition as an objective measure of intelligibility. *J Med Speech Lang Pathol*, 18:99–104, 2010.
22. Li, Z., Coles, C. D., Lynch, M. E., Hamann, S., Peltier, S., LaConte, S., and Hu, X. Prenatal cocaine exposure alters emotional arousal regulation and its effects on working memory. *Neurotoxicol Teratol*, 31:342–348, 2009.
21. Beauchamp, M. S., LaConte, S., and Yasar, N. Distributed representation of single touches in somatosensory and visual cortex. *Hum Brain Mapp*, 30:3163–3171, 2009.
20. Deshpande, G., LaConte, S., James, G. A., Peltier, S., and Hu, X. Multivariate Granger causality analysis of fMRI data. *Hum Brain Mapp*, 30:1361–1373, 2009.
19. Deshpande, G., LaConte, S., Peltier, S., and Hu, X. Integrated local correlation: a new measure of local coherence in fMRI data. *Hum Brain Mapp*, 30:13–23, 2009.
18. Zhuang, J., Peltier, S., He, S., LaConte, S., and Hu, X. Mapping the connectivity with structural equation modeling in an fMRI study of shape-from-motion task. *NeuroImage*, 42:799–806, 2008.
17. Nana, R., Zhao, T., Heberlein, K., LaConte, S. M., and Hu, X. Cross-validation-based kernel support selection for improved GRAPPA reconstruction. *Magn Reson Med*, 59:819–825, 2008.
16. Yang, Z., LaConte, S., Weng, X., and Hu, X. Ranking and averaging independent component analysis by reproducibility (RAICAR). *Hum Brain Mapp*, 29:711–725, 2008.
15. Stilla, R., Deshpande, G., LaConte, S., Hu, X., and Sathian, K. Posteromedial parietal cortical activity and inputs predict tactile spatial acuity. *J Neurosci*, 27:11091–11102, 2007.
14. LaConte, S. M., Peltier, S. J., and Hu, X. P. Real-time fMRI using brain-state classification. *Hum Brain Mapp*, 28:1033–1044, 2007.
13. Peltier, S., Stilla, R., Mariola, E., LaConte, S., Hu, X., and Sathian, K. Activity and effective connectivity of parietal and occipital cortical regions during haptic shape perception. *Neuropsychologia*, 45:476–483, 2007.
12. Deshpande, G., LaConte, S., Peltier, S., and Hu, X. Tissue specificity of nonlinear dynamics in baseline fMRI. *Magn Reson Med*, 55:626–632, 2006.
11. McDaniel, C., Veledar, E., LaConte, S., Peltier, S., and Maciuba, A. Ethical environment, healthcare work, and patient outcomes. *Am J Bioeth*, 6:17–29, 2006.
10. Peltier, S. J., LaConte, S. M., Niyazov, D. M., Liu, J. Z., Sahgal, V., Yue, G. H., and Hu, X. P. Reductions in interhemispheric motor cortex functional connectivity after muscle fatigue. *Brain Res*, 1057:10–16, 2005.
9. Ma, X., Coles, C. D., Lynch, M. E., LaConte, S. M., Zurkiya, O., Wang, D., and Hu, X. Evaluation of corpus callosum anisotropy in young adults with fetal alcohol syndrome according to diffusion tensor imaging. *Alcohol Clin Exp Res*, 29:1214–1222, 2005.

8. LaConte, S., Strother, S., Cherkassky, V., Anderson, J., and Hu, X. Support vector machines for temporal classification of block design fMRI data. *NeuroImage*, 26:317–329, 2005.
7. Zhuang, J., LaConte, S., Peltier, S., Zhang, K., and Hu, X. Connectivity exploration with structural equation modeling: an fMRI study of bimanual motor coordination. *NeuroImage*, 25:462–470, 2005.
6. Wang, D., Heberlein, K., LaConte, S., and Hu, X. Inherent insensitivity to RF inhomogeneity in FLASH imaging. *Magn Reson Med*, 52:927–931, 2004.
5. Ma, X., Kadah, Y. M., LaConte, S. M., and Hu, X. Enhancing measured diffusion anisotropy in gray matter by eliminating CSF contamination with FLAIR. *Magn Reson Med*, 51:423–427, 2004.
4. LaConte, S., Anderson, J., Muley, S., Ashe, J., Frutiger, S., Rehm, K., Hansen, L. K., Yacoub, E., Hu, X., Rottenberg, D., and Strother, S. The evaluation of preprocessing choices in single-subject BOLD fMRI using NPAIRS performance metrics. *NeuroImage*, 18:10–27, 2003.
3. Strother, S. C., Anderson, J., Hansen, L. K., Kjems, U., Kustra, R., Sidtis, J., Frutiger, S., Muley, S., LaConte, S., and Rottenberg, D. The quantitative evaluation of functional neuroimaging experiments: the NPAIRS data analysis framework. *NeuroImage*, 15:747–771, 2002.
2. LaConte, S. M., Ngan, S. C., and Hu, X. Wavelet transform-based Wiener filtering of event-related fMRI data. *Magn Reson Med*, 44:746–757, 2000.
1. Ngan, S. C., LaConte, S. M., and Hu, X. Temporal filtering of event-related fMRI data using cross-validation. *NeuroImage*, 11:797–804, 2000.

## BOOK CHAPTERS

1. Deshpande, G., LaConte, S., Peltier, S., and Hu, X. Connectivity analysis of human functional MRI data: From linear to nonlinear and static to dynamic. In *Medical Imaging and Augmented Reality, Lecture Notes in Computer Science*, pages 17–24. Springer, 2006.

## CONFERENCE PAPERS

15. Vogt, W. C., Romero, E., LaConte, S. M., and Rylander, C. G. Mechanical indentation improves cerebral blood oxygenation signal quality of functional near-infrared spectroscopy (fNIRS) during breath holding. In *SPIE BiOS*, pages 85782K–85782K. International Society for Optics and Photonics, 2013.
14. Peltier, S., Noll, D., Lisinski, J., and LaConte, S. Multivariate classification of complex and multi-echo fMRI data. *International Workshop on Pattern Recognition in Neuroimaging (PRNI)*, pages 229–232, 2013.
13. Papageorgiou, T., Curtis, W. A., McHenry, M., and LaConte, S. M. Neurofeedback of two motor functions using supervised learning-based real-time functional magnetic resonance imaging. *Conf Proc IEEE Eng Med Biol Soc*, 1:5377–5380, 2009.
12. Peltier, S. J., Lisinski, J. M., Noll, D. C., and LaConte, S. M. Support vector machine classification of complex fMRI data. *Conf Proc IEEE Eng Med Biol Soc*, 1:5381–5384, 2009.
11. Metwalli, N. S., LaConte, S. M., and Hu, X. P. An information theoretic approach characterizing diffusion anisotropy in diffusion-weighted magnetic resonance images. *Conf Proc IEEE Eng Med Biol Soc*, 1:2260–2263, 2006.
10. Deshpande, G., LaConte, S., Peltier, S., and Hu, X. Directed transfer function analysis of fMRI data to investigate network dynamics. *Conf Proc IEEE Eng Med Biol Soc*, 1:671–674, 2006.
9. Peltier, S. J., LaConte, S. M., Niyazov, D., Liu, J., Sahgal, V., Yue, G., and Hu, X. Changes in interhemispheric motor connectivity after muscle fatigue. *Proc SPIE Medical Imaging*, 5746:657–661, 2005.

8. Deshpande, G., LaConte, S., Peltier, S., and Hu, X. Spatial embedding of fMRI for investigating local coupling in human brain. *Proc SPIE Medical Imaging*, 5746:119–125, 2005.
7. Kadah, Y. M., Ma, X., LaConte, S., Yassine, I., and Hu, X. Robust multi-component modeling of diffusion tensor magnetic resonance imaging data. *Proc SPIE Medical Imaging*, 5746:148–159, 2005.
6. Peltier, S. J., LaConte, S., Kadah, Y., and Hu, X. Robust ICA analysis for model-free functional connectivity detection. *Proc SPIE Medical Imaging*, 5369:691–699, 2004.
5. Peltier, S. J., LaConte, S. M., and Hu, X. Online detection of low-frequency functional connectivity. *Proc SPIE Medical Imaging*, 5369:683–690, 2004.
4. LaConte, S. M., Peltier, S., Kadah, Y., Ngan, S.-C., Deshpande, G., and Hu, X. Detecting nonlinear dynamics of functional connectivity. *Proc SPIE Medical Imaging*, 5369:227–237, 2004.
3. Youssef, T., Youssef, A.-B. M., LaConte, S., Hu, X., and Kadah, Y. M. Robust ordering of independent components in functional magnetic resonance imaging time series data using canonical correlation analysis. *Proc SPIE Medical Imaging*, 5031:332–340, 2003.
2. Youssef, T., Youssef, A.-B. M., LaConte, S., Hu, X., and Kadah, Y. M. Nonparametric suppression of random and physiological noise components in functional magnetic resonance imaging using cross-correlation spectrum subtraction. *Proc SPIE Medical Imaging*, 5031:324–331, 2003.
1. LaConte, S. M. pH control of microalgae using simulated power plant flue gas. *IEEE Student Papers*, 1996.

## CONFERENCE ABSTRACTS

Selected (from over 100)

- Craddock, C., Lisinski, J., and LaConte, S. M. Online denoising strategies for real-time tracking default mode network activity. In *Third Biennial Conference on Resting State Brain Connectivity*, Magdeburg, 2012.
- Craddock, R. C., Lisinski, J., Chiu, P., Mayberg, H., and LaConte, S. Real-time tracking and biofeedback of the default mode network. In *18th Annual Meeting of the Organization for Human Brain Mapping*, Beijing, 2012.
- LaConte, S., Lisinski, J., and Sutton, B. Support vector machines can decode speech patterns from high speed dynamic spiral FLASH images of the mouth. In *Proceedings 19th Scientific Meeting, International Society for Magnetic Resonance in Medicine*, Montreal, page 139, 2011.
- Craddock, C. and LaConte, S. Estimation of resting state network activity using multivariate prediction analysis regression. In *Proceedings 19th Scientific Meeting, International Society for Magnetic Resonance in Medicine*, Montreal, page 1605, 2011.
- Peltier, S. J., Lisinski, J., Noll, D. C., and LaConte, S. Support vector machine classification of fMRI data in image and k-space domains. In *Proceedings 18th Scientific Meeting, International Society for Magnetic Resonance in Medicine*, Stockholm, page 270, 2010.
- LaConte, S. M., King-Casas, B., Cinciripini, P. M., Eagleman, D. M., Versace, F., and Chiu, P. H. Modulating rt-fMRI neurofeedback interfaces via craving and control in chronic smokers. *15th Annual Meeting of the Organization for Human Brain Mapping*, San Francisco, *Neuroimage*, 47:45, 2009.
- Papageorgiou, D., Curtis, W., McHenry, M., and LaConte, S. M. Differences in prediction accuracy and distributed patterns of activity for automatic covert speech with and without neurofeedback from real-time functional magnetic resonance imaging. In *38th Annual Meeting of Society for Neuroscience (SfN)*, Washington D. C., 2008.
- LaConte, S. and Hu, X. Utilizing the covariance relationships in complex natural stimulus descriptors in fMRI brain state analysis. *13th Annual Meeting of the Organization for Human Brain Mapping*, Chicago, 2007.

- LaConte, S., Kadah, Y., and Hu, X. Brain state classification of rapid event-related fMRI using mixed models. In *Proceedings 15th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Berlin*, page 3466, 2007.
- LaConte, S., Glielmi, C., Heberlein, K., and Hu, X. Verifying visual fixation to improve fMRI with predictive eye estimation regression (PEER). In *Proceedings 15th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Berlin*, page 3438, 2007.
- LaConte, S., Peltier, S., Heberlein, K., and Hu, X. Predictive eye estimation regression (PEER) for simultaneous eye tracking and fMRI. In *Proceedings 14th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Seattle*, page 2808, 2006.
- Williams, K., Peltier, S., LaConte, S., and Keilholz, S. MRI evidence of resting state connectivity in rodent brain. In *Proceedings 14th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Seattle*, page 2119, 2006.
- LaConte, S., Peltier, S., and Hu, X. Real-time classification of brain states for fMRI experiments. *11th Annual Meeting of the Organization for Human Brain Mapping, Toronto*, 2005.
- LaConte, S., Chen, J., Peltier, S., and Hu, X. Discriminating one finger from another: Support vector classification of event-related fMRI. In *Proceedings 13th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Miami*, page 1583, 2005.
- LaConte, S., Chen, J., Peltier, S., and Hu, X. Humans out-learning the machine: Support vector machines applied to fMRI of human motor learning. In *Proceedings 13th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Miami*, page 568, 2005.
- LaConte, S., Peltier, S., and Hu, X. Real-time prediction of brain states using fMRI. In *Proceedings 12th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Kyoto*, page 2551, 2004.
- LaConte, S., Strother, S., Cherkassky, V., and Hu, X. Predicting motor tasks in fMRI data with support vector machines. In *Proceedings 11th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Toronto*, page 494, 2003.
- LaConte, S., Ngan, S.-C., Zhuang, J., Heberlein, K., Peltier, S., and Hu, X. Dynamical determinism related to functional connectivity in fMRI baseline time series. In *Proceedings 11th Scientific Meeting, International Society for Magnetic Resonance in Medicine, Toronto*, page 1778, 2003.
- LaConte, S., Anderson, J., Muley, S., Frutiger, S., Hansen, L., Yacoub, E., Hu, X., Rottenberg, D., Ashe, J., and Strother, S. C. Evaluating preprocessing choices in single-subject BOLD-fMRI studies using data-driven performance metrics. *7th Annual Meeting of the Organization for Human Brain Mapping, Brighton, England, NeuroImage*, 13(Part 2):S179, 2001.
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## MEDIA COVERAGE

**December 2013** WSLs Evening News. Alcohol addiction becomes focus of brain research at VTCRI.

**October 2013** The Prism, Hosted by Andrew Hiller, The Voice of Russia, American Edition Digitally remastering the brain.

**March 2013** WSLs Evening News. Brain Computer Interface developed by local researcher.

**August 2012** Through the Wormhole with Morgan Freeman.

**February 2012** WSLs Evening News. Silent public health epidemic: local study on traumatic brain injury.