# Committee on Energy and Commerce
# U.S. House of Representatives
**Witness Disclosure Requirement - "Truth in Testimony"**
**Required by House Rule XI, Clause 2(g)(5)**

| | | |
|---|---|---|
| **1. Your Name:** Thomas M. Talavage | | |
| **2. Your Title:** Professor of Electrical & Computer Engineering; Professor of Biomedical Engineering | | |
| **3. The Entity(ies) You are Representing:** Purdue Neurotrauma Group | | |
| **4. Are you testifying on behalf of the Federal, or a State or local government entity?** | **Yes** | **No** X |

**5. Please list any Federal grants or contracts, or contracts or payments originating with a foreign government, that you or the entity(ies) you represent have received on or after January 1, 2013. Only grants, contracts, or payments related to the subject matter of the hearing must be listed.**

a) Co-Principal Investigator (PI: Brenna McDonald, IUSM), Indiana Clinical and Translational Sciences Institute Neuroscience Strategic Research Initiative, "Multi-site Evaluation of the Role of Deep Brain Structures in Long-term Neurological Disorder After Traumatic Brain Injury," August 1, 2014 – July 31, 2016, $100,000 (Support: $88,030).

b) Co-Principal Investigator (PI: Sharlene Newman, IU-Bloomington), Indiana Clinical and Translational Sciences Institute Collaboration in Translational Research Grant, "Neurological Consequences of Middle School Contact Sports Participation," October 1, 2015 – September 30, 2017, $62,398 (Support: $24,898).

**6. Please attach your curriculum vitae to your completed disclosure form.**

**Signature:** [redacted] **Date:** 11 May 2016

**Name:** Thomas M. Talavage

**Education:**

| *Degree* | *Date* | *School* |
|---|---|---|
| BSCEE | May 1992 | Purdue University (*Highest Distinction*) |
| MSEE | Aug 1993 | Purdue University<br>*Advisor: R.L. Kashyap* |
| PhD | Jun 1998 | Massachusetts Institute of Technology<br>*Advisors: B.R. Rosen and J.R. Melcher* |

**Honorary Society Memberships:**

[1] Alpha Lambda Delta (1989)
[2] Phi Eta Sigma (1989)
[3] Eta Kappa Nu (1991)
[4] Tau Beta Pi (1991)
[5] Golden Key (1992)
[6] Phi Kappa Phi (1992)

**Honors and Awards:**

[1] Purdue University Presidential Honors Award (1989)
[2] McDonnell-Douglas Scholarship (1991-1992)
[3] Outstanding Male Initiate, Golden Key Honor Society, Purdue Chapter (Spring 1992)
[4] DuPont Graduate Fellowship in Electrical Engineering (1992)
[5] Purdue University Andrews Fellowship (1992; Declined)
[6] National Science Foundation Graduate Fellowship (1992-1996)
[7] NIH T32 Training Grant Fellowship (1994-1998)
[8] Ruth and Joel Spira Outstanding Teacher Award – ECE (Spring 2000)
[9] Teaching for Tomorrow Program – Purdue University (2000-2001)
[10] Dean Marion B. Scott Outstanding Professor Award – Tau Beta Pi, IN A (Spring 2001)
[11] Who's Who Among America's Teachers (2002)
[12] Motorola Excellence in Teaching Award – ECE (Spring 2003)
[13] Outstanding Professor Award – Eta Kappa Nu, Beta Chapter (Spring 2004)
[14] Purdue University College of Engineering Young Researcher Award (2005)
[15] C. Holmes MacDonald Outstanding Electrical and Computer Engineering Teacher Award – Eta Kappa Nu Association (2005)
[16] Purdue University College of Engineering Advising Award (Spring 2008)
[17] Purdue University College of Engineering Engagement/Service Award (Spring 2008)
[18] Outstanding Professor Award – Eta Kappa Nu, Beta Chapter (Fall 2011)
[19] Purdue University College of Engineering Team Award – Purdue Neurotrauma Group (Spring 2013)

[20] Weldon School of Biomedical Engineering Faculty Service Award (Fall 2013)
[21] University Faculty Scholar, Purdue University (2015-2020)
[22] Lead, *Engineering Healthier Brains*, Purdue University College of Engineering 2014 Preeminent Team (announced 13 Nov 2015)

**Professional Experience:**

| | |
|---|---|
| May 1989 – Aug 1989 | Summer programmer<br>Pritsker Corporation, West Lafayette, IN |
| May 1990 – Aug 1990 | Summer programmer<br>Pritsker Corporation, West Lafayette, IN |
| Aug 1998 – Aug 2005 | Assistant Professor<br>School of Electrical & Computer Engineering<br>Weldon School of Biomedical Engineering<br>Purdue University |
| Aug 2005 – Aug 2012 | Associate Professor<br>School of Electrical & Computer Engineering<br>Weldon School of Biomedical Engineering<br>Purdue University |
| Aug 2012 – Present | Professor<br>School of Electrical & Computer Engineering<br>Weldon School of Biomedical Engineering<br>Purdue University |
| Jan 2004 – Present | Adjunct Assistant Professor<br>Department of Radiology<br>Indiana University School of Medicine |
| Nov 2007 – Present | Founding Co-Director, Purdue MRI Facility<br>Weldon School of Biomedical Engineering<br>Purdue University |

**Research Grants and Contracts Received:**

[1] Principal Investigator (no co-PIs), PRF Showalter Grant, "Functional Magnetic Resonance Imaging (fMRI) of Human Sensory Systems," July 1, 1999 - June 30, 2000, $50,000.

[2] Principal Investigator (no co-PIs), PRF Summer Faculty Grant, "Functional Magnetic Resonance Imaging (fMRI) Determination of Auditory Linguistic Threshold," June 1, 2000 - July 31, 2000, $5,000.

[3] Principal Investigator (no co-PIs), PRF Research Grant, "Characterization of Reduction of Systemic Noise in fMRI," June 1, 2001 - May 31, 2003, $26,140.

[4] Principal Investigator (no co-PIs), General Electric Medical Systems, "Modeling of 1.5 T and 3.0 T Magnetic Resonance Imager Acoustic Noise Fields During Echo-Planar Imaging," June 1, 2002 - May 31, 2003, $8,662.

[5] Principal Investigator (no co-PIs), Indiana Center for Excellence in Biomedical Imaging 21st Century Funds Pilot Award, "fMRI of Simulated Cochlear Implant Language Stimulation," July 1, 2002 - June 30, 2003, $31,330.

[6] Principal Investigator (no co-PIs), NIH/NIBIB R21 EB00524, "An fMRI-Compatible Hand Controller for Subject Interaction," May 15, 2002 - October 31, 2003, $112,502.

[7] Principal Investigator (no co-PIs), American Hearing Research Foundation Grant, "Simulation and Evaluation of a Novel Rehabilitation Scheme for Cochlear-Implant Patients," January 1, 2003 - December 31, 2003, $18,000.

[8] Co-Principal Investigator (PI: John A. Nyenhuis, Purdue), Rita Medical, "MRI Compatibility of Electrodes," June 1, 2003 - August 30, 2004, $7,000 (Support: $3,000).

[9] Principal Investigator (no co-PIs), Guidant Corporation, "Torque Measurement for Guidant Insignia I Plus Implantable Pulse Generator," January 1, 2004 - December 31, 2004, $4,533.

[10] Principal Investigator (no co-PIs), PRF Research Grant, "Characterizing and Accounting for Acoustic Scanner Noise in Event-Related fMRI," June 1, 2003 - May 31, 2005, $27,978.

[11] Consultant (PI: Jackson T. Gandour, Purdue), NIH/NIDCD R01 DC004585, "Functional Neuroimaging Studies of Speech Prosody," January 1, 2003 - June 30, 2005, $1,193,341 (Support: $28,763).

[12] Co-Investigator (PI: David A. Kareken and Gary D. Hutchins, IUSM), Eli Lilly, "Effects of AMPA potentiation on regional cerebral physiology, behavior and induced brain dysfunction: An exploratory, imaging study in healthy volunteers," October 1, 2004 - September 30, 2005, $450,000 (Support: $5,000).

[13] Co-Investigator (PI: David A. Kareken, IUSM), Alcoholic Beverage Medical Research Foundation, "Functional MRI of alcohol olfactory cues during IV ethanol infusion," January 1, 2005 - December 31, 2005, $50,000 (Support: $5,000).

[14] Subcontract Principal Investigator (PI: Elizabeth Thompson, IPFW), NIH/NIMH R21 MH068267, "Application of the STAP Algorithm to fMRI Data," May 1, 2004 - April 30, 2006, $241,413 (Subcontract: $59,250).

[15] Co-Investigator (PI: Kenneth Byrd, IUSM), American Equilibration Society, “fMRI analysis in bruxers and non-bruxers,” March 1, 2005 - May 31, 2006, $15,400 (Support: $2,400).

[16] Principal Investigator (no co-PIs), Indiana Radiology Associates, “Prof. Talavage support from IU Department of Radiology,” May 1, 2003 - December 31, 2006, $103,140.

[17] Co-Investigator (PI: Mario A. Svirsky, IUSM), Purdue University/Indiana University School of Medicine Collaboration in Biomedical Research Committee, “Perceptual Learning with a Distorted Sensory Input,” January 15, 2005 - December 31, 2006, $50,000 (Support: $19,831).

[18] Co-Investigator (PI: David A. Kareken, IUSM), NIH/NIAAA R01 AA014605, “fMRI of the mesolimbic dopamine system in risky drinkers,” August 10, 2005 - June 30, 2009, $1,527,556 (Support: $40,297).

[19] Co-Investigator (PI: Jeffrey Gilger, Purdue), American Psychological Foundation Esther Katz Rosen Grant, “A Neurodevelopmental Study of the Gifted and Twice Exceptional,” August 1, 2006 - July 31, 2009, $75,000 (Support: $18,750).

[20] Principal Investigator (no co-PIs), NIH/NIBIB R03 EB004855, “fMRI Detection by Clustering Model Fitting Parameters,” August 1, 2007 - July 31, 2009, $143,368.

[21] Consultant (PI: Mario A. Svirsky, IUSM), NIH/NIDCD R01 DC003937, “Models of Speech Perception by Cochlear Implant Users,” September 1, 2004 - August 31, 2009, $1,723,315 (Support: $172,592).

[22] Principal Investigator, Diversity Supplement to NIH/NIBIB R01 EB003990, “Systematic Artifact Reduction in Auditory fMRI,” March 7, 2007 - January 31, 2010, $131,750.

[23] Principal Investigator, Indiana Clinical and Translational Sciences Institute Project Development Team Grant, “Optical Stimulation of the Auditory Nerve: Characterization of Response Properties for Alternative Cochlear Implant Design,” May 1, 2009 – April 30, 2010, $3,500.

[24] Principal Investigator (co-PI: Larry J. Leverenz, Purdue), Indiana State Department of Health, Indiana Spinal Cord and Brain Injury Research Fund (Grant #203753), "Predictive Modeling of Cognitive Impairment from Head Trauma in Collegiate Football Players," January 1, 2009 - December 31, 2010, $120,000.

[25] Principal Investigator (co-PI: Charles A. Bouman, Purdue), NIH/NIBIB R01 EB003990, “Systematic Artifact Reduction in Auditory fMRI,” February 1, 2006 - January 31, 2011, $1,333,244.

[26] Co-Investigator (PI: Amit Anand, IUSM), NIH/NIMH R01 MH075025, “Dysfunctional Cortico-Limbic Activity and Connectivity in Bipolar Disorder and Lithium Effects: An fMRI Study,” March 17, 2007 - February 28, 2011, $1,215,523 (Support: $44,365).

[27] Principal Investigator (co-PIs: Charles A. Bouman, Eric A. Nauman, Larry J. Leverenz, Dennis A. Miller, Purdue), General Electric Healthcare, "Predictive Modeling of

Cognitive Impairment from Head Trauma in Collegiate Football Players," July 1, 2009 – May 31, 2011, $50,000.

[28] Investigator (PI: Jeff C. Ko, Purdue), Purdue University Discovery Park Seed Grant Program, “A New Method for Pain Assessment – functional MRI (fMRI) as a tool to assess acute and chronic pain in animals,” January 1, 2009 – December 31, 2011, $50,000 (Support: $25,000).

[29] Principal Investigator, Indiana Clinical and Translational Sciences Institute, Core Facilities Grant, “Assessment of Cognitive Function as a Possible Biomarker of Mild Traumatic Brain Injury,” July 1, 2011 – June 30, 2012, $9,600.

[30] Co-Principal Investigator (PI: Carol Boushey, Purdue), NIH/NCI U01 CA130784-04S1), “Improving Dietary Assessment Methods Using the Cell Phone and Digital Imaging,” August 1, 2010 – July 31, 2012, $133,410 (Support: $4,540).

[31] Principal Investigator, PRF Research Grant, “Predictive Modeling of Cognitive Impairment from Head Trauma in High School Athletes,” October 1, 2011 – September 30, 2012, $17,059.

[32] Co-Principal Investigator (PI: Wayne Campbell, Purdue), American Egg Board, “Effect of Increased Protein Intake with Exercise on Markers of Systemic Inflammation, Metabolic Health Status and Skeletal Muscle Adaptation in Older Adults,” January 1, 2011 – December 31, 2012, $164,856 (Support: $36,060).

[33] Principal Investigator, MIT Lincoln Laboratory, “Multi-modal Early Detection Interactive Classifier (MEDIC) System for Mild Traumatic Brain Injury (TBI) Assessment,” July 17, 2012 – July 18, 2013, $35,000.

[34] Principal Investigator (co-PI: Larry J. Leverenz, Purdue), Indiana Clinical and Translational Sciences Institute, Spinal Cord and Brain Injury Research Fund (SCBI 207-5), "Predictive Modeling of Cognitive Impairment from Head Trauma in High School Athletes," August 1, 2011 – July 31, 2013, $120,000.

[35] Principal Investigator (co-PI: Ulrike Dydak, Purdue), Indiana Clinical and Translational Sciences Institute, Spinal Cord and Brain Injury Research Fund (SCBI 207-32), "MR Spectroscopic Quantification of Brain Injury in High School Athletes," August 1, 2012 – July 31, 2014, $115,320.

[36] Investigator, OVPR Emerging Research Incentive Grant Program. “Next-Generation Orthobiologics for Joint Repair,” August 1, 2013 – May 31, 2016, $300,000 (Support: $14,430).

[37] Principal Investigator, PRF Research Grant, “Quantification of Microbleeds in Functional Impairment of Collision-Sport Athletes,” August 15, 2013 – July 31, 2014, $17,059.

[38] Principal Investigator (co-PIs: Eric A. Nauman, Larry J. Leverenz, Purdue), General Electric Healthcare, "Enhanced Imaging of Neurotrauma Associated with Head Trauma in High School Collision Sports," December 15, 2013 – August 14, 2014, $100,000.

[39] Co-Principal Investigator (PI: Michael E. Singer, BrainScope, Inc.), GE-NFL Head Health Initiative Challenge #1, "Acute Concussion Triage Using Portable EEG Assessment Trained With Imaging Biomarkers of Injury," May 1, 2014 – May 31, 2015, $300,000.

[40] Co-Principal Investigator (PI: Brenna McDonald, IUSM), Indiana Clinical and Translational Sciences Institute Neuroscience Strategic Research Initiative, "Multi-site Evaluation of the Role of Deep Brain Structures in Long-term Neurological Disorder After Traumatic Brain Injury," August 1, 2014 – July 31, 2016, $100,000 (Support: $88,030).

[41] Co-Principal Investigator (PI: Sharlene Newman, IU-Bloomington), Indiana Clinical and Translational Sciences Institute Collaboration in Translational Research Grant, "Neurological Consequences of Middle School Contact Sports Participation," October 1, 2015 – September 30, 2017, $62,398 (Support: $24,898).

[42] Investigator (PI: Zhongming Liu, Purdue), NIH/NIMH R01 MH104402, "Multimodal Hyperspectral Imaging of Brain Activity and Connectivity," August 1, 2014 – April 30, 2019, $2,000,000 (Support: $14,124).

**Professional Society Activities:**

Organization: IEEE (Institute of Electrical and Electronic Engineers)
Engineering in Medicine and Biology Society (EMBS)
Signal Processing Society

Activity: Student Member, 1989 –1998
Member, 1998 – 2011
Senior Member, 2011 – Present

Positions:

- Co-Chair, Functional Neuroimaging Track, *26th Annual International Conference of the IEEE EMBS* (2004)
- Co-Chair, Neuroimaging Symposium, *26th Annual International Conference of the IEEE EMBS* (2004)
- Session Chair, *26th Annual International Conference of the IEEE EMBS* (2004)
- Judge, Student Paper Competition, *26th Annual International Conference of the IEEE EMBS* (2004)
- Judge, Student Design Competition, *26th Annual International Conference of the IEEE EMBS* (2004)
- Session Chair, *28th Annual International Conference of the IEEE EMBS* (2006)
- Associate Editor, Biomedical Imaging and Image Processing Track, *30th Annual International Conference of the IEEE EMBS* (2008)
- Associate Editor, Biomedical Imaging and Image Processing Track, *31st Annual International Conference of the IEEE EMBS* (2009)

- Associate Editor, Biomedical Imaging and Image Processing Track, *32nd Annual International Conference of the IEEE EMBS* (2010)
- Associate Editor, Biomedical Imaging and Image Processing Track, *33rd Annual International Conference of the IEEE EMBS* (2011)
- Associate Editor, Biomedical Imaging and Image Processing Track, *34th Annual International Conference of the IEEE EMBS* (2012)
- Technical Program Committee Member, Special Sessions Co-Chair, *International Symposium on Biomedical Imaging (ISBI)* 2011
- Board of Governors for IEEE-Eta Kappa Nu (2009 – 2012)
- Chair, Communications Committee (ad-hoc), IEEE-Eta Kappa Nu Board of Governors (2013)

Organization: International Society for Magnetic Resonance in Medicine
Activity: Student Member, 1995 – 1998
Member, 1998 – present

Positions:

- Secretary, Current Issues in Brain Function Study Group, 2006-2007.
- Session Chair, *16th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine* (2008)
- Educational Session Moderator, *Absolute Beginner's Guide*, at the *19th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine* (2011)

Organization: Organization for Human Brain Mapping
Activity: Member, 1998 – present

Organization: Association for Research in Otolaryngology
Activity: Member, 2002 – present

Organization: Biomedical Engineering Society
Activity: Member, 2015 – present

**PhD Thesis Supervision Completed (Primary Advisees):**

| *Name* | *Date* | *Thesis Title* |
|---|---|---|
| J. Brandon Laflen | Dec. 2003 | "Measurement and Analysis of Perceptual Coding in the Human Auditory System: Multi-Modal Studies Using Neural Activation Patterns" |
| Gregory G. Tamer, Jr. | May 2005 | "Characterizing and Accounting for Acoustic Scanner Noise in Auditory Cortex Event-Related fMRI" |

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|---|---|---|
| Ashish Rao | Aug. 2005 | "Model based estimation and detection of hemodynamic response in event-related fMRI" |
| Sun Geun Kim | Aug. 2008 | "Neural correlates of visual and audio-visual perception using functional magnetic resonance imaging (fMRI)" |
| Javier Gonzalez Castillo | Dec. 2009 | "Application of Functional Magnetic Resonance Imaging to the Study of Language" |
| Shuowen Hu | Dec. 2009 | "Characterization and compensation of artifacts in functional magnetic resonance imaging" |
| Liang Liu | May 2010 | "Probability discriminant analysis for functional MRI and model-based tuning algorithm for MRI coil array" |
| Olumide Olulade | May 2010 | "Characterizing the Effect of Recent Acoustic History Properties on Auditory fMRI Responses" |
| Ruwan Ranaweera | Dec. 2010 | "Nonlinear Effects in Hemodynamic Response in Primary Auditory Cortex Associated with Temporal Patterns of Acoustic History" |
| Kihwan Han | May 2011 | "Methodologies to Enhance the Reliability of Functional MRI Analysis" |
| Andrea Snyder | Aug. 2011 | "Monitoring/Evaluating Disease States Using Functional Magnetic Resonance Imaging" |
| Daniel Aguiar | May 2012 | "Use of Computational Modeling of Auditory Nerve Activation Patterns for the Optimization of Cochlear Implant Electrical Stimulation Patterns" |
| Meghan Robinson | Dec. 2012 | "Functional Neuroimaging of Concussive and Sub-Concussive Head Injuries in High School Athletes and a Field Diagnostic for Detecting Them" |

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|---|---|---|
| Christopher Smalt | Dec. 2012 | "Functional Magnetic Resonance Imaging (fMRI) of a Real-Time Cochlear Implant Acoustic Simulation and Auditory Modeling of the Medial Olivocochlear Efferent System" |
| Minseok Kwon | May 2014 | "Modification of Computational Auditory Scene Analysis (CASA) for Noise-Robust Acoustic Feature" |
| Victoria Poole | Aug. 2014 | "Magnetic Resonance Spectroscopy as a Tool to Track Sustained Neuro-metabolic Changes Indicating Impairment in High School Contact Sport Athletes" |
| Il Yong Chun | Aug. 2015 | "Advances in Medical Imaging and Image Reconstruction" |

**PhD Thesis Supervision Completed (Co-Advisees):**

| *Name* | *Date* | *Thesis Title* |
|---|---|---|
| John Kassebaum | May 2008 | "Application of Frequency Domain State-Space Analysis to Sleep" (Co-advisor with Professor Russell Eberhart, IUPUI ECE) |
| Lejian Huang | May 2009 | "Novel imaging-processing-based analysis of fMRI data" (Co-advisor with Professor Mary Comer, ECE) |
| Catherine Strickland | Dec. 2009 | "Patient-specific three-dimensional geometric segmentation and model development for use with image-guided robotics systems for minimally invasive spine surgery" (Co-advisor with Professor Eric A. Nauman, ME) |
| Ching-Chih Wu | Dec. 2014 | "Current Steering and Electrode Spanning with Partial Tripolar Stimulation Mode in Cochlear Implants" (Co-advisor with Prof. Xin Luo, SLHS) |

**Master's Thesis Supervision Completed:**

| *Name* | *Date* | *Thesis Title* |
|---|---|---|

| | | |
|---|---|---|
| Jared Brosch | Dec. 2000 | "Physiologic Noise Analysis in fMRI - Investigative Comparison Using Human Subject Data and Mechanically Induced Noise Data" |
| Ulas Ziyan | Dec. 2001 | "Removal of Respiratory Artifacts from fMRI Data" |
| James Pollaro | May 2003 | "Image Space Estimation and Removal of Undersampled Respiration Noise in Multi-Slice fMRI Data" |
| Eri Haneda | Aug. 2003 | "fMRI Evaluation of a Novel Rehabilitation Scheme for Cochlear-Implant Users" |
| Jeffrey Jackson | Aug. 2003 | "An MR-Compatible Computer Joystick Device: Design Approaches and Tradeoff Analysis" |
| Pranesh Thirukkonda | Aug. 2003 | "Simplified Model of Auditory Nerve Activation Patterns Induced by Cochlear Implants" |
| Gilbert Tseng | May 2004 | "Characterization of Acoustic Noise Generated by Magnetic Resonance Imaging" |
| Ruwan Ranaweera | May 2005 | "Time-Frequency Features in Electroencephalography for Brain-Computer Interfacing" |
| Shrestha Basu Mallick | Dec. 2005 | "Technique for High Spatial Resolution, Focused Electrical Stimulation of Electrically-Excitable Tissue"<br>(Physics; co-advised with Prof. Ian Shipsey) |
| Chad Lau | May 2006 | "Sensiomotor Integration in Dexterous Control of Objects with Precision Grip"<br>(co-advised with Dr. Kristine Mosier, IUSM Department of Radiology) |
| Olumide Olulade | Aug. 2006 | "Characterizing the Effect of Acoustic Imaging Noise and Acoustic Time History in Auditory Cortex Functional Magnetic Resonance Imaging" |

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|---|---|---|
| N. Ellen Taylor | May 2007 | “Evaluation of a Noiseband-Based Cochlear Implant Simulator” |
| Angela Hoffa | May 2008 | “fMRI of the Visual System for Application to Schizophrenia” |
| Joseph Santos | Dec. 2008 | "Novel Pre-Surgical Screening for Cochlear Implant Candidates" |
| Joshua Hayden | May 2009 | “Diffusion weighted imaging in auditory functional magnetic resonance imaging” |
| Minseok Kwon | Aug. 2009 | “Characterization of acoustic imaging noise-induced hemodynamic response as a function of noise intensity in human auditory cortex fMRI at 3.0T” |
| Josh Speciale | May 2010 | “Sparse Representation of Parallel MRI Reconstruction” |
| Peter McKinnis | Aug. 2010 | “Analysis of Respiration Compensation Techniques in fMRI” |
| Allan Diaz | Dec. 2013 | “Detection of Brain Abnormalities in Football Players through Diffusion Weighted Imaging” |
| Aditya Balasubramanian | May 2014 | “Developing a Hardware Platform for a Low-Power, Low-Cost, Size-Constrained Biomechanical Telemetry System” |
| Blaine Gardner | May 2014 | “Developing an Embedded System Solution for High-speed, High-capacity Data Logging for a Size-constrained, Low-power, Biomechanical Telemetry System and Investigating Components for Optimal Performance” |
| Jeffery King | Dec. 2014 | “Developing a Practical Wireless Monitoring Solution for a Size Constrained, Low-Power, Biomechanical, Sports Telemetry System” |

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| Chetas Joshi | May 2015 | "Cerebrovascular Reactivity Alterations Due to Subconcussive Repetitive Head Trauma in Asymptomatic High School Football Athletes" |
| Xianglun Mao | May 2015 | "Individual Analysis of T2*-Weighted Gradient Echo Imaging in Asymptomatic and Symptomatic Athletes" |

**Master's and PhD Thesis Students Currently Being Supervised:**

| | | |
|---|---|---|
| Kausar Abbas | Ph.D. | (Began August 2011; ECE; passed QE; prelim) |
| Sumra Bari | Ph.D. | (Began August 2013; ECE; passed QE) |
| Ikbeom Jang | Ph.D. | (Began August 2013; ECE; passed QE) |
| Pratik Kashyap | Ph.D. | (Began August 2014; ECE) |
| Jing Li | Ph.D. | (Began August 2013; ECE; passed QE) |
| Xianglun Mao | Ph.D. | (Began May 2015; ECE; passed QE) |
| Usman Sadiq | Ph.D. | (Began August 2011; ECE; passed QE; Co-advisor with Prof. Charles Bouman, ECE) |
| Trey Shenk | Ph.D. | (Began May 2012; ECE; passed QE; prelim) |
| Diana Svaldi | Ph.D. | (Began August 2013; BME; passed QE; prelim) |
| Hyungsuk Kim | M.S. | (Began January 2015; ECE) |
| Soonho Kwon | M.S. | (Began January 2015; ECE) |

**Graduate Research Project Course Supervision:**

| *Name* | *Proj. Type* | *Date* | *Title* |
|---|---|---|---|
| Allene Manning | EE 696 | Dec. 1998 | "Functional Magnetic Resonance Imaging" |
| Teju Prasad | ECE 696 | Dec. 2000 | "Auditory fMRI" |
| Delphina Han | ECE 696 | May 2001 | "Auditory fMRI" |
| P. Thirukkonda | ECE 696 | May 2002 | "fMRI of Hearing and Language" |
| Yi-Shao Liu | ECE 696 | Dec. 2002 | "fMRI Noise Cancellation" |
| Chih-Hsin Huang | ECE 696 | Dec. 2003 | "Generation of acoustic stimuli from a modeled cochlear implant-induced neural activation pattern" |

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| Martin Beckmann | ECE 696 | Dec. 2008 | "MRI Pulse Sequence Programming" |
| Ching-Chih Wu | ECE 696 | Dec. 2008 | "Cochlear Implant Simulation" |
| Candice Gentry | BME 696 | Dec. 2009<br>May 2010<br>Dec. 2010 | "Functional MRI" |
| Nate Elder | ECE 696 | May 2011 | "fMRI of Visual Perception" |
| Thilo Balke | ECE 696 | May 2015 | "MRI in Neurotrauma" |

**Undergraduate Research Project Course Supervision:**

| *Name* | *Proj. Type* | *Date* | *Title* |
|---|---|---|---|
| Jared Brosch | EE 496 | Dec. 1998<br>May 1999 | "fMRI Analysis Tools"<br>"fMRI Data Analysis" |
| Arjun Sinha | EE 496 | Dec. 1999 | "Auditory Cortex Interconnectivity" |
| Ashish Tiwari | EE 496 | Dec. 1999 | "Magnetic Resonance Imaging Simulation" |
| W. Aaron Kay | EE 496 | May 2000 | "Overview of the Olfactory System" |
| Christopher Hiatt | ECE 496 | Dec. 2000 | "Functional Magnetic Resonance Imaging" |
| G.K. Viswanathan | ECE 496 | Dec. 2000 | "Auditory fMRI" |
| Jeffrey Jackson | ECE 496 | Dec. 2000 | "MRI Controller" |
| Gilbert Tseng | ECE 496 | Dec. 2000 | "MRI Controller" |
| James Telecsan | ECE 496 | Dec. 2000 | "MRI Controller" |
| James Pollaro | ECE 496 | May 2001 | "MRI Controller" |
| Eric Tkaczyk | ECE 496 | May 2001 | "MRI Simulator" |
| Daniel Dickinson | ECE 496 | Aug. 2001 | "Optical Joystick" |
| Erik Douglas | ECE 496 | Dec. 2001 | "fMRI of Nonsense Words" |
| Bryce Lobdell | ECE 496 | May 2002 | "MATLAB Simulation of MRI" |
| Stephen Cauley | ECE 496 | May 2002<br>May 2003 | "Event-Related fMRI Analysis" |
| Michael Parker | ECE 496 | May 2002 | "Conversion of Data for Use with the Talairach Coordinate System" |
| Jeremy Nethercutt | ECE 496 | Aug. 2002 | "MRI Cortex Reconstruction" |

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| | | May 2003<br>Dec. 2003 | |
| Nick Anderson | ECE 496 | Dec. 2002 | “fMRI Joystick Optics” |
| Santiago Duarte | ECE 496 | Dec. 2002 | “fMRI of Language” |
| Xiaobo Shi | ECE 496 | Dec. 2002<br>May 2003 | “fMRI Noise Cancellation”<br>“Noise Cancellation Analysis” |
| Fan Lee | ECE 496 | Aug. 2003<br>Dec. 2003 | “Simulation of CI Stimulation”<br>“Auditory Nerve Modeling” |
| Stephen Foldes | ECE 496 | Dec. 2003 | “Waveguide Stimulation” |
| Ka Ki Ng | ECE 496 | May 2005 | “Investigating Trial Location Variability in ER-fMRI of Visual Cortex” |
| Himani Shah | ECE 496 | Dec. 2005 | “fMRI of Motion Perception” |
| Akshay Kothari | ECE 496 | May 2006 | “fMRI Respiration Compensation” |
| Eric Naglich | ECE 496 | May 2006 | “Practical Guide to the Design of a 1.5 Tesla Receive-Only Auditory Cortex MRI coil” |
| Dan Gazanfari | ECE 496 | Aug. 2007<br>Aug. 2008 | “Cochlear Implants”<br>“Evaluation of Acoustic Simulations of Cochlear Implants” |
| Meenal Patel | BME 498 | May 2008<br>Dec. 2008 | “Functional MRI of the Auditory Cortex”<br>"FMRI of Auditory System" |
| Namita Agrawal | BME 296 | Dec. 2008 | "fMRI of Audio-Visual Integration" |
| Tiffany Sukwanto | ECE 496 | Dec. 2008 | "Functional MRI Research" |
| Sukyoun Choi | ECE 496 | May 2010 | “Functional MRI Applications” |
| Alexander Gaul | ECE 496 | May 2010<br>Dec. 2010 | “FMRI Analysis” |
| Keith Mier | ECE 496 | May 2010 | “FMRI Analysis” |
| Allan Diaz | ECE 496 | Aug. 2011 | “Parallel Imaging Reconstruction” |
| Jeff King | ECE 496 | Dec. 2011<br>May 2012<br>Dec. 2012 | “Football Telemetry”<br>“Sports Telemetry” |

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|---|---|---|---|
| Paul Rosenberger | ECE 496 | Dec. 2011 | "Football Telemetry" |
| | | May 2012 | "Sports Telemetry" |
| Ashley Eidsmore | ECE 496 | May 2012 | "Sports Telemetry" |
| Jake Gilfix | ECE 496 | May 2012 | "Sports Telemetry" |
| Xiaodong Li | ECE 496 | May 2012 | "MRI of Brain Trauma" |
| Caroline Trippel | ECE 496 | May 2012 | "Laser Excitation of Tissue" |
| Wudi Zhou | ECE 496 | May 2012 | "Sports Telemetry" |
| Zheyang Zhu | ECE 496 | May 2012 | "FMRI of Sports Injury" |
| | | Aug. 2012 | |
| JunSang Jin | ECE 496 | Dec. 2012 | "MRI of MTBI" |
| Sheik Dawood | ECE 496 | May 2013 | "fMRI of mTBI" |
| Hannah Prost | BIOL 294 | May 2013 | "fMRI of mTBI" |
| | BIOL 494 | Dec. 2013 | |
| | BIOL 494 | May 2014 | |
| Ruofei Chen | ECE 496 | May 2013 | "DTI of mTBI" |
| | | Dec. 2013 | |
| Sijia Qiu | ECE 496 | May 2013 | "DTI of mTBI" |
| | | Dec. 2013 | "Imaging of mTBI" |
| Michael Reutman | ECE 496 | Dec. 2013 | "MRI of mTBI" |
| Soon Ho Kwon | ECE 496 | May 2014 | "MRI Image Analysis" |
| | | Aug. 2014 | "Telemetry Analysis" |
| | | Dec. 2014 | "Impact Telemetry" |
| Hyung Suk Kim | ECE 496 | Aug. 2014 | "Telemetry Analysis" |
| | | Dec. 2014 | "Wireless Telemetry" |
| Ali Alrashoudi | ECE 296 | Dec. 2014 | "Telemetry and Imaging" |
| | | May 2015 | "Wireless Telemetry" |
| | | Aug. 2015 | "Neurotrauma Imaging" |
| Allen Chien | ECE 496 | Dec. 2014 | "Wireless Telemetry" |
| | | May 2015 | |
| | | Dec. 2015 | |
| Mikhiel Desai | ECE 296 | Dec. 2014 | "Impact Telemetry" |
| | | May 2015 | "Wireless Telemetry" |
| | | Dec. 2015 | |
| Sahil Sanghani | ECE 496 | Dec. 2014 | "Wireless Telemetry" |

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|---|---|---|---|
| Chase Haddix | BME 296<br>BME 498 | May 2015<br>Dec. 2015 | "Optical Nerve Stim" |
| Shuhui Tang | ECE 496 | May 2015 | "Telemetry and Imaging" |
| Rui Tian | ECE 496 | May 2015<br>Dec. 2015 | "Telemetry and Imaging"<br>"TBI Neuroimaging" |
| Matthew Leiter | ECE 496 | May 2015 | "Telemetry Apps" |

**Summer Undergraduate Research Experience Supervision:**

| *Name* | *Insitution* | *Program* | *Duration* |
|---|---|---|---|
| Kelly Bratic | Univ. Pittsburgh | REU (BME) | May-Aug 2001 |
| Alex Espinosa | Rose-Hulman | REU (BME) | May-Aug 2002 |
| Karen Hardy | Kettering Univ. | REU (BME) | May-Aug 2003 |
| N. Ellen Taylor | Rose-Hulman | REU (BME) | May-Aug 2004 |
| Adeshola Lawal | Univ. Minnesota | SURF (ECE) | May-Aug 2005 |
| Joseph Santos | UPR-Mayaguez | SURF (ECE) | May-Aug 2005 |
| Angela Hoffa | Purdue Univ. | REU (BME)<br>SURF (BME)<br>SURF (BME) | May-Aug 2005<br>May-Aug 2006<br>May-Aug 2007 |
| Rachel Lenhart | Univ. Tennessee | REU (BME) | May-Aug 2006 |
| Matteo Mannino | Purdue Univ. | SURI (ECE) | May-Aug 2006 |
| Mehmet Gunal | Purdue Univ. | SURF (ECE) | May-Aug 2006 |
| Namita Agrawal | Purdue Univ. | SURF (BME) | May-Aug 2008 |
| Hecmarie Melendez | UPR-Piedras | SROP (BME) | May-Jul 2011 |
| Samantha Tulisiak | St. Mary's College | HHMI (BME) | May-Jul 2011 |
| Daniel Wodicka | Johns Hopkins | SURF (BME) | May-Aug 2011 |
| Paul Rosenberger | Purdue Univ. | SURF (ECE) | May-Aug 2012 |

**Courses Developed:**

- BME/ECE 528 — Measurement and Stimulation of the Nervous System (begun Spring 2002)
- ECE 695T/BME 695R — Magnetic Resonance Imaging (begun Fall 2008)
- BME 595 — Functional MRI Applications (RET Module; begun Spring 2009)
- ECE 202H — Linear Circuit Analysis II, Honors (begun Spring 2010; with S. Pekarek)

- BME 595 — Medical Imaging and Diagnostic Technology (begun Fall 2013)

**Courses "In Charge Of":**

- ECE 255 — Electronic Devices Analysis and Design (Fall 1999 – Fall 2014)
- ECE 400 — ECE Senior Seminar (Fall 2003 – Fall 2007)
- ECE 520 — Topics in Bioengineering (Fall 1998 – Fall 2004)
- ECE 528 — Measurement and Stimulation of the Nervous System (Spring 2002 – Present)
- BME 595 — Functional MRI Applications (Spring 2009 – 2010)
- ECE 695T — Magnetic Resonance Imaging (Fall 2008 – Present)

**School Committee Activities:**

- Committee: ECE Qualifying Exam Committee
  Activity: Member, 1998 – 2000
  Member, 2002 – 2004
  Member, 2007 – Present
- Committee: ECE Curriculum Committee
  Activity: Member, 1999 – 2002
- Committee: BME Curriculum Committee
  Activity: Member, 2003 – 2008
- Committee: ECE Graduate Committee
  Activity: Member, 2004 – 2007
- Committee: BME MD/PhD Committee
  Activity: Chair, 2005 – 2010
  Member, 2010 – Present
- Committee: ECE External Review Committee (Ad Hoc)
  Activity: Member, 2005 – 2006
- Committee: ECE Strategic Planning Committee
  Activity: Member, 2007 – 2009
- Committee: BME External Review Committee (Ad Hoc)
  Activity: Member, 2008 – 2009
- Committee: BME Graduate Committee
  Activity: Chair, 2011 – Present

**Engineering-Wide Committee Activities:**

- Committee: First Year Engineering

Activity: Member (BME), 2003 – 2009

- Committee: Faculty Affairs Committee
  Activity: Member (ECE), 2010 – 2013

**University-Wide Committee Activities:**

- Committee: Healthcare Engineering Signature Area Committee
  Activity: Member (BME), 2006 – 2015
- Committee: Computational Life Sciences Graduate Program Committee
  Activity: Member (ECE), 2007 – Present
- Committee: University Senate
  Activity: Member (ECE), 2013 – Present

**Research Book Contributions and Books Published:**

[1] J.R. Melcher, T.M. Talavage and M.P. Harms, "Functional MRI of the Auditory System," Chapter 32 in *Functional MRI*, C.T.W. Moonen, P.A. Bandettini, eds., Springer-Verlag, Mauer, Germany, 1999.

[2] T.M. Talavage, I.S. Johnsrude and J. Gonzalez-Castillo, "Hemodynamic Imaging: Functional Magnetic Resonance Imaging," Chapter 6 in *Springer Handbook of Auditory Research, Vol. 43: The Human Auditory Cortex*, D. Poeppel, T. Overath, A. Popper, R. Fey, eds., Springer-Verlag, Mauer, Germany, 2012.

**Serial Journal Articles:**

[1] P. W. Woodruff, R. R. Benson, P. A. Bandettini, K. K. Kwong, R. J. Howard, **T. Talavage**, J. Belliveau, and B. R. Rosen, "Modulation of auditory and visual cortex by selective attention is modality-dependent," *NeuroReport*, vol. 7, no. 12, pp. 1909-13, Aug 1996, 10.1097/00001756-199608120-000007.

[2] A. R. Guimaraes, J. R. Melcher, **T. M. Talavage**, J. R. Baker, P. Ledden, B. R. Rosen, N. Y. Kiang, B. C. Fullerton, and R. M. Weisskoff, "Imaging subcortical auditory activity in humans," *Human Brain Mapping*, vol. 6, no. 1, pp. 33-41, Jul 1998, 10.1002/(SICI)1097-0193(1998)6:1<33::AID-HBM3>3.0.CO;2-M.

[3] R. R. Benson, D. B. FitzGerald, L. L. LeSueur, D. N. Kennedy, K. K. Kwong, B. R. Buchbinder, T. L. Davis, R. M. Weisskoff, **T. M. Talavage**, W. J. Logan, G. R. Cosgrove, J. W. Belliveau, and B. R. Rosen, "Language dominance determined by whole brain functional MRI in patients with brain lesions," *Neurology*, vol. 52, no. 4, pp. 798-809, Mar 1999, 10.1212/WNL.52.4.798.

[4] **T. M. Talavage**, W. B. Edmister, P. J. Ledden, and R. M. Weisskoff, "Quantitative assessment of auditory cortex responses induced by imager acoustic noise," *Human Brain*

*Mapping*, vol. 7, no. 2, pp. 79-88, Feb 1999, 10.1002/(SICI)1097-0193(1999)7:2<79::AID-HBM2>3.0.CO;2-R

[5] W. B. Edmister, **T. M. Talavage**, P. J. Ledden, and R. M. Weisskoff, "Improved auditory cortex imaging using clustered volume acquisitions," *Human Brain Mapping*, vol. 7, no. 2, pp. 89-97, Feb 1999, 10.1002/(SICI)1097-0193(1999)7:2<89::AID-HBM2>3.0.CO;2-N.

[6] **T. M. Talavage**, P. J. Ledden, R. R. Benson, B. R. Rosen, and J. R. Melcher, "Frequency-dependent responses exhibited by multiple regions in human auditory cortex," *Hearing Research*, vol. 150, no. 1-2, pp. 225-44, Dec 2000, 10.1016/S0378-5955(00)00203-3.

[7] J. R. Brosch, **T. M. Talavage**, J. L. Ulmer, and J. A. Nyenhuis, "Simulation of human respiration in fMRI with a mechanical model," *IEEE Transactions on Biomedical Engineering*, vol. 49, no. 7, pp. 700-7, Jul 2002, 10.1109/TBME.2002.1010854.

[8] X. Li, J. Gandour, **T. Talavage**, D. Wong, M. Dzemidzic, M. Lowe, and Y. Tong, "Selective attention to lexical tones recruits left dorsal frontoparietal network," *NeuroReport*, vol. 14, no. 17, pp. 2263-6, Dec 2003, 10.1097/01.wnr.0000097045.56589.31.

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experience," *Human Brain Mapping*, vol. 27, no. 2, pp. 173-83, Feb 2006, 10.1002/hbm.20176.

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**Pending Serial Journal Articles:**

[1] K. Abbas, J. Goni and T.M. Talavage, "History of Exposure to Concussions and Subconcussions in High School Football Alters Graph Theory Measures of Functional Connectivity."

[2] I.Y. Chun, S. Noh, D.J. Love, T.M. Talavage, S. Beckley and S.J. Kisner, "MSE-Based Excitation Pattern Design for MIMO SENSE MRI Image Reconstruction."

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[170] J.M. Speciale, C.A. Bouman and T.M. Talavage, "Accelerating Parallel Acquisition Reconstruction with Sparse Matrix Transformations," *19th Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Montreal, Quebec, Canada, May 2011, CD-ROM #2871.

[171] T.M. Talavage, E.L. Breedlove, K.E. Morigaki, M.E. Robinson, R.D. Ranaweera, E.A. Nauman and L.J. Leverenz, "fMRI Assessment of Effects of Technique on Neurological Impairment in High School Football Players," *19th Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Montreal, Quebec, Canada, May 2011, CD-ROM #3642. **{E-Poster}**

[172] O. Olulade, J. Gilger, T. Talavage, G. Hynd, C. McAteer, "FMRI Evidence for Spatial Visualization Differences in Dyslexic Individuals," *17th Annual Meeting of the*

*Organization for Human Brain Mapping*, Quebec, Quebec, Canada, June 2011, CD-ROM #168.

[173] M. Robinson, T. Talavage, E. Breedlove, K. Morigaki, R. Benson, E. Nauman and L. Leverenz, "How many hits is too many? Toward a dose-response of head collisions as revealed in football by fMRI," *17th Annual Meeting of the Organization for Human Brain Mapping*, Quebec, Quebec, Canada, June 2011, CD-ROM #307.

[174] C. Smalt, J. Gonzalez Castillo, M. Svirsky, D. Pisoni and T. Talavage, "Neural Adaptation of Normal Hearing Listeners to a Portable Cochlear Implant Acoustic Simulation," *17th Annual Meeting of the Organization for Human Brain Mapping*, Quebec, Quebec, Canada, June 2011, CD-ROM #810.

[175] E. Malaia, R. Ranaweera, T. Talavage and R. Wilbur, "Default Network in Deaf Signers," *17th Annual Meeting of the Organization for Human Brain Mapping*, Quebec, Quebec, Canada, June 2011, CD-ROM #975.

[176] C. Smalt, T. Talavage, D. Pisoni and M. Svirsky, "Neural Adaptation and Perceptual Learning using a Portable Real-Time Cochlear Implant Simulator in Natural Environments," *Proceedings of the 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Boston, MA, August 2011, p. 1145-1148.

[177] O.H. Melendez-Fernandez, S. Tulisiak, D. Wodicka and T.M. Talavage, "Towards Progress in Neurocognitive Injury Assessment in High School Contact Sports," Presented at the 2011 Annual Biomedical Research Conference for Minority Students, St. Louis, MO, November 2011.

[178] C.J. Smalt, A. Krishnan and T.M. Talavage, "A Subtraction Method to Reduce Cochlear Implant Electrical Artifact Contamination of Sustained Auditory Brainstem Responses," *Abstracts of the 35th Annual Midwinter Meeting of the Association for Research in Otolaryngology*, San Diego, CA, February 2012.

[179] V.N. Poole, E. Breedlove, M. Robinson, K. Morigaki, L. Leverenz, E. Nauman, U. Dydak and T. Talavage, "Asymptomatic high school contact sport athletes exhibit metabolic changes that correlate with head collision history," *Neuroscience 2012*, New Orleans, LA, October 13–17, 2012, #552.07/L13.

[180] N. Zhang, M. Robinson, V. Poole, E. Breedlove, K. Morigaki Breedlove, L. Leverenz, E. Nauman and T. Talavage, "Influence of In-Season Hit History and Post-Season Recovery Time on Brain Health in High School Football Players," *The 65th Annual Eastern Athletic Trainers' Association Convention*, Buffalo, NY, January 2013.

[181] E.L. Breedlove, J. Gilger, M. Robinson, K. Morigaki Breedlove, V. Poole. L.J. Leverenz, T.M. Talavage and E.A. Nauman, "The Effect of Number, Location, and Magnitude of Hits to the Head on Changes in Neurophysiology for a Population of High School Football Players," *2013 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 4, 2013.

[182] K.M. Breedlove, E.L. Breedlove, M. Robinson, V. Poole, T.M. Talavage, L.J. Leverenz, E.A. Nauman, "Neurophysiological Deficits in Football Assessed Using ImPACT, fMRI and Head Impact Telemetry," *2013 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 4, 2013.

[183] D. Aguiar, T. Talavage and J.B. Laflen, "A Case Study of Optimized Cochlear Implant Stimulation in a Congenitally Deaf Individual." *Abstracts of the 36th Annual Midwinter Meeting of Association for Research in Otolaryngology*, Baltimore, MD, February 2013.

[184] V.N. Poole, L. Leverenz, E. Nauman, T. Talavage and U. Dydak, "1H MRS Suggests Chronic and Acute Injury in High School Football Players," *21st Annual Meeting of the International Society for Magnetic Resonance in Medicine*, Salt Lake City, UT, April 2013. **{E-Poster}**

[185] T. Shenk, K. Abbas, E. Breedlove, V. Poole, K. Breedlove, L. Leverenz, E. Nauman, T. Talavage and M. Robinson, "Functional Connectivity Alterations in Asymptomatic High School Football Players," *21st Annual Meeting of the International Society for Magnetic Resonance in Medicine*, Salt Lake City, UT, April 2013. **{E-Poster}**

[186] I.Y. Chun, A. Diaz, Y.-J. Jin, X. Li, L. Leverenz, E. Nauman and T. Talavage, "Robust Detection of Progressive White Matter Abnormalities in mTBI using DW-MRI," *21st Annual Meeting of the International Society for Magnetic Resonance in Medicine*, Salt Lake City, UT, April 2013. **{E-Poster}**

[187] M. Robinson, E. Breedlove, V. Poole, L. Leverenz, E. Nauman and T. Talavage, "Proximal and Distal Effects of Subconcussive Head Impacts on fMRI Activity in Asymptomatic High School Football Players," *21st Annual Meeting of the International Society for Magnetic Resonance in Imaging*, Salt Lake City, UT, April 2013.

[188] I.Y. Chun and T. Talavage, "Fast Non-Convex Statistical Compressed Sensing MRI Reconstruction Based on Approximated Lp(0<p<1)-Quasi-Norm with Fewer Measurements than Using L1-Norm," *21st Annual Meeting of the International Society for Magnetic Resonance in Imaging*, Salt Lake City, UT, April 2013.

[189] I.Y. Chun and T. Talavage, "Edge-Preserving Non-Iterative MAP SENSE MRI Reconstruction," *21st Annual Meeting of the International Society for Magnetic Resonance in Imaging*, Salt Lake City, UT, April 2013.

[190] I.Y. Chun and T. Talavage, "Sparse Tikhonov-Regularized SENSE MRI Reconstruction," *21st Annual Meeting of the International Society for Magnetic Resonance in Imaging*, Salt Lake City, UT, April 2013.

[191] I.Y. Chun, A. Diaz, X. Li, Y.J. Jin, L. Leverenz, E. Nauman and T. Talavage, "DTI Detection of Symptomatic and Asymptomatic Injury Due to Repetitive Head Blows," *19th Annual Meeting of the Organization for Human Brain Mapping*, Seattle, WA, June 2013, #3277

[192] K. Abbas, T. Shenk, E. Breedlove, K. Breedlove, V. Poole, L. Leverenz, E. Nauman, T. Talavage and M. Robinson, "Functional Connectivity in Asymptomatic High School

Football Players and Non-Contact Athletes," *19th Annual Meeting of the Organization for Human Brain Mapping*, Seattle, WA, June 2013, #3280

[193] V. Poole, U. Dydak, L. Leverenz, E. Nauman and T. Talavage, "Spectroscopic Analysis of Neuro-metabolic Changes in Female Soccer Players," *19th Annual Meeting of the Organization for Human Brain Mapping*, Seattle, WA, June 2013, #3296.

[194] I.Y. Chun and T.M. Talavage, "Efficient Statistical Compressed Sensing X-Ray CT Reconstruction from Fewer Measurements," *Proceedings of the 12th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine*, Lake Tahoe, CA, June 2013, p. 30-33. **{Oral Presentation}**

[195] K. Abbas, T. Shenk, E. Breedlove, K. Breedlove, V. Poole, L. Leverenz, E. Nauman, T. Talavage and M. Robinson, "Functional Connectivity in Asymptomatic High School Football Players and Non-Contact Athletes," *3rd Indiana Neuroimaging Symposium*, Bloomington, IN, October 25, 2013.

[196] I.Y. Chun, A. Diaz, S. Qiu, L.Leverenz, E. Nauman and T. Talavage, "DTI Detection of Symptomatic and Asymptomatic Injury Due to Repetitive Hit Exposures," *3rd Indiana Neuroimaging Symposium*, Bloomington, IN, October 25, 2013.

[197] K. Abbas, T. Shenk, E. Breedlove, K. Breedlove, V. Poole, L. Leverenz, E. Nauman, T. Talavage and M. Robinson, "Functional Connectivity in Asymptomatic High School Football Players and Non-Contact Athletes," *2014 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 2-6, 2014.

[198] V. Poole, K. Breedlove, T. Shenk, K. Abbas, M. Robinson, E. Breedlove, L. Leverenz, E. Nauman, U. Dydak and T. Talavage, "Neurometabolic Influences on ImPACT Cognitive Testing in Collision Athletes," *2014 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 2-6, 2014.

[199] L. Leverenz, K. Breedlove, E. Breedlove, M. Robinson, V. Poole, J.R. King, P. Rosenberger, M. Rasmussen, T. Talavage and E. Nauman, "Quantifying the Risk of Abnormal Neurophysiology as a Result of Sub-Concussive Blows in High School Football Athletes," Presented at the 2014 IOC World Conference on Prevention of Injury & Illness in Sport, Monaco, April 2014, *British Journal of Sports Medicine* 48(7):627.

[200] K. Dunville, J.E. Kim, J. Li, T. Conley, J.X. Cheng, T. Talavage, C. Couture and W. Campbell, "Skeletal muscle fat accumulation and increased fatty acid saturation are related to worsening glucose control in older adults," Presented at Experimental Biology 2014, April 2014, *The FASEB Journal*, 28(1 Suppl):133.8.

[201] I.Y. Chun, B. Adcock and T. Talavage, "Non-Convex Compressed Sensing CT Reconstruction Based on Tensor Discrete Fourier Slice Theorem," *36th Annual International IEEE EMBS Conference*, Chicago, IL, August 26-30, 2014, #FC05.6. {**Oral Presentation**}

[202] I.Y. Chun, B. Adcock and T. Talavage, "Efficient Compressed Sensing SENSE Parallel MRI Reconstruction with Joint Sparsity Promotion and Mutual Incoherence

Enhancement," *36th Annual International IEEE EMBS Conference*, Chicago, IL, August 26-30, 2014, #TB05.7.

[203] A. Barbu, N. Siddharth, D. Barrett, W. Chen, C. Xiong, J.J. Corso, C.D. Fellbaum, C. Hanson, S.J. Hanson, S. Helie, E. Malaia, B.A. Pearlmutter, J.M. Siskind, T.M. Talavage and R.B. Wilbur, "Seeing is Worse than Believing: Reading People's Minds Better than Computer-Vision Methods Recognize Actions," *European Conference on Computer Vision 2014*, Zürich, Switzerland, September 6-12, 2014, pp. 612-627. {**24% acceptance rate**}

[204] K. Abbas, T.E. Shenk, V.N. Poole, L.J. Leverenz, E.A. Nauman, T.M. Talavage and M.E. Robinson, "Hyper-connectivity in the Default Mode Network (DMN) of Asymptomatic High School Football Athletes as a Result of Repetitive Subconcussive Head Trauma," *Fourth Biennial Conference on Resting State/Brain Connectivity*, Cambridge, MA, September 11-13, 2014.

[205] E. Malaia, J. Gonzalez-Castillo, C. Weber-Fox, T.M. Talavage and R.B. Wilbur, "Neural processing of verbal event structure: temporal and functional dissociation between telic and atelic verbs." In: Mandouilidou, C., de Ameida, R. (eds.) *Cognitive Science Perspectives on Verb Representation and Processing*, 2015, pp. 131 - 140.

[206] K. Abbas, T.E. Shenk and T.M. Talavage, "High school football athletes with history of concussion have relatively vulnerable and faster aging resting state brain network than those without" *23rd Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Toronto, Ontario, Canada, May 30-June 5, 2015, #1426.

[207] I. Jang, I.Y. Chun, L.J. Leverenz, E.A. Nauman and T.M. Talavage, "Robust Detection of Axonal Abnormalities in High School Collision-Sport Athletes: Longitudinal Single Subject Analysis," *23rd Annual Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, Toronto, Ontario, Canada, May 30-June 5, 2015, #4419 {**E-poster**}

[208] I. Jang, I.Y. Chun and T. Talavage, "DWI Detection of WM Abnormality and Relation with Collision Events in High School Athletes," *21st Annual Meeting of the Organization for Human Brain Mapping*, Honolulu, HI, June 2015, #1315.

[209] X. Mao, E. Nauman and T. Talavage, "A Study of Susceptibility Weighted MRI in Asymptomatic and Symptomatic Athletes," *21st Annual Meeting of the Organization for Human Brain Mapping*, Honolulu, HI, June 2015, #1324.

[210] T.E. Shenk, D. Svaldi, M. Robinson and T. Talavage, "An fMRI Comparison of Two High-School Football Teams," *21st Annual Meeting of the Organization for Human Brain Mapping*, Honolulu, HI, June 2015, #1337.

[211] D. Svaldi, C. Joshi and T. Talavage, "Cerebrovascular Reactivity alterations in Female High School Soccer players," *21st Annual Meeting of the Organization for Human Brain Mapping*, Honolulu, HI, June 2015, #1342.

[212] S. Bari, I.Y. Chun, L. Leverenz, E. Nauman and T. Talavage, "DTI Detection of WM Abnormalities using Randomization Test with Complete and Incomplete Pairs," *21st Annual Meeting of the Organization for Human Brain Mapping*, Honolulu, HI, June 2015, #2198.

[213] R.D. Sayer, G.G. Tamer, Jr., N. Chen, J.R. Tregellas, M.A. Cornier, D.A. Kareken, T.M. Talavage and W.W. Campbell, "Effects of Acute Aerobic Exercise and Protein Intake on Appetite and the Neural Response to Visual Food Cues," Presented at Experimental Biology 2015, March 28-April 1, 2015, *The FASEB Journal*, 29(1 Suppl):597.13.

[214] T. Shenk, T. Balke, K. Abbas and T. Talavage, "Disrupted Executive Control Network of Female Soccer Players Found Using Dual-Regression ICA," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October, 2015, #P-Fr-605.

[215] K. Abbas, J. Goni and T. Talavage, "History of Concussion Reduces Brain Resting State Network Efficiency," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October 2015, #P-Fr-609.

[216] M.U. Sadiq, K. Abbas and T. Talavage, "Correlating Sub-concussive Brain Injuries with Decreased Grey Matter Volume," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October 2015, #P-Fr-611.

[217] C. Joshi, D. Svaldi, E. Nauman and T. Talavage, "Cerebrovascular Reactivity Changes in Asymptomatic Football Athletes," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October 2015, #P-Fr-612.

[218] B. Cummiskey, E. Nauman, J. Meyer, D. Adams, T. Talavage and L. Leverenz, "Direct Assessment of Impact Mitigation by Football Helmets," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October 2015. {**Oral Presentation**}

[219] X. Mao, J. Murray and T. Talavage, "Magnitude Susceptibility-weighted Imaging Analysis on Neurophysiological Changes of High School Female Soccer Athletes," *Biomedical Engineering Society 2015 Annual Meeting*, Tampa, FL, October 2015. {**Oral Presentation**}

[220] R.D. Sayer, A. Amankwaah, G.G. Tamer, Jr., N. Chen, J.R. Tregellas, M.A. Cornier, D.A. Kareken, T.M. Talavage, M. McCrory and W.W. Campbell, "Effects of Dietary Protein and Fiber at Breakfast on Postprandial Appetite, Neural Responses to Visual Food Stimuli and *ad libitum* Energy Intake at Lunch in Overweight Adults," Presented at Experimental Biology 2016, April 2-6, 2016, *The FASEB Journal*, 30(1 Suppl):418.7.

[221] R.D. Sayer, G.G. Tamer, Jr., N. Chen, J.R. Tregellas, M.A. Cornier, D.A. Kareken, T.M. Talavage, M. McCrory and W.W. Campbell, "Test-Retest Reliability and Postprandial Time Course of the Neural Responses to Visual Food Stimuli," Presented at Experimental Biology 2016, April 2-6, 2016, *The FASEB Journal*, 30(1 Suppl):1161.4.

[222] K. Abbas and T.M. Talavage, "Resilience of Functional Brain Networks to Focal Damage in Asymptomatic Football Athletes," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

[223] S. Bari, K. Abbas, E. McCuen, L. Leverenz, E. Nauman and T. Talavage, "MR Spectroscopic Changes in Asymptomatic High School Soccer Athletes Due to Repetitive Head Trauma," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

[224] I. Jang, T. Talavage, E. Nauman and L. Leverenz, "Collision-Sports and Axonal Impairment: DWI Assessment in High School Football Athletes," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

[225] X. Mao, T. Shenk, L. Leverenz and T. Talavage, "The Effect of Task Performance on N-back fMRI Among High School Athletes," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

[226] M.U. Sadiq and T.M. Talavage, "Investigating Changes in Hippocampal Volume and Cognitive Performance in High School Contact-Sport Athletes," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

[227] M.U. Sadiq and T.M. Talavage, "Investigating Cortical Thinning in Contact-Sport Athletes with History of Concussion," *22nd Annual Meeting of the Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016.

**Invited Lectures:**

[1] "Functional Magnetic Resonance Imaging of Sensory Systems," Anatomy Seminar Series, Department of Anatomy, Indiana University School of Medicine, Indianapolis, IN, April 1, 1999.

[2] "Auditory fMRI: Neurophysiology and Applications to Language Perception," DeVault Otologic Research Laboratory, Indiana University School of Medicine, Indianapolis, IN, May 16, 2000.

[3] "Use of fMRI for the Study of Audition and Language Perception," Speech Research Laboratory, Indiana University, Bloomington, IN, February 8, 2002.

[4] "Medical Imaging Research Activities at Purdue University," General Electric Medical Systems, Applied Sciences Laboratory, Waukesha, WI, March 1, 2002.

[5] "Current ECE Research in Medical Imaging at Purdue University," General Electric Medical Systems, Applied Sciences Laboratory, Waukesha, WI, February 27, 2004.

[6] "fMRI Evaluation of a Novel Cochlear Implant Rehabilitation Strategy: Improving Adaptation to Basalward Shift for Speech Perception in CI Users," General Electric Medical Systems, Applied Sciences Laboratory, Waukesha, WI, February 27, 2004.

[7] "Auditory fMRI: Results, Problems and Solutions," Speech Research Laboratory, Indiana University, Bloomington, IN, December 14, 2004.

[8] "Auditory Neuroscience with fMRI: Problems and Solutions," Biophysics Seminar Series, Department of Biophysics, Medical College of Wisconsin, Milwaukee, WI, March 4, 2005.

[9] "Auditory fMRI: Neurophysiology to Perception," Grand Rounds, Department of Otolaryngology-Head and Neck Surgery, University of Cincinnati College of Medicine, Cincinnati, OH, March 9, 2005.

[10] "Brain Mapping of Frequency Tonotopy in the Auditory Cortex," *Workshop on the Functional Organization of the Laminar Structure of the Auditory Cortex,* Johns Hopkins University, Baltimore, MD, February 4, 2006.

[11] "Auditory Neuroengineering," MD/PhD Seminar Series, Indiana University School of Medicine, Indianapolis, IN, March 23, 2006.

[12] "fMRI of Auditory Neurophysiology: Tonotopy and Related Issues," Department of Biomedical Engineering, Illinois Institute of Technology, Chicago, IL, October 20, 2006.

[13] "Inverse and Iterative Solutions in Neuroimaging and Neuroscience," MIND Institute, Albuquerque, NM, December 7, 2007.

[14] "Audio-Visual Integration Benefit During Degraded Speech Perception: Behavioral Measures from an fMRI Study," Speech Research Laboratory, Indiana University, Bloomington, IN, April 4, 2008.

[15] "Neuroimaging at Purdue: A Vision for the Future," *2nd Annual Indiana Neuroimaging Symposium*, Indianapolis, IN, April 25, 2008.

[16] "Inverse Solutions: The Purdue MRI Facility and You," *3rd Annual Purdue/Korean Institute of Science and Technology Global Research Laboratory Symposium*, Seoul, South Korea, June 2, 2008.

[17] "Neuroimaging Correlates of Neurocognitive Evaluation of High School Football Players," *Purdue University-University of Pittsburgh Medical Center Summit on Concussion in Sports*, West Lafayette, IN, February 28, 2010. [Talavage]

[18] "Neuroimaging Correlates of Neurocognitive Evaluation of High School Football Players," Department of Radiology, Wayne State University, Detroit, MI, April 20, 2010. [Talavage]

[19] "Functional Impairments in High School Football Players: How do we detect occult injury and minimize future risk?" Center for the Study of Learning, Georgetown University, Washington, D.C., November 3, 2010. [Talavage]

[20] "Functional Impairments in High School Football Players: How do we detect occult injury and minimize future risk?" Section on Functional Imaging Methods, NIMH, NIH, Washington, D.C., November 4, 2010. [Talavage]

[21] "Neurological Impairment in Football Players: Detecting injury and minimizing future risk," *Research in 5*, Purdue University Science Journalism Laureates Reception, West Lafayette, IN, November 4, 2010. [Nauman (for Talavage)]

[22] "Predictive Modeling of Cognitive Impairment from Head Trauma," *The 63rd Annual Eastern Athletic Trainers' Association Convention*, Philadelphia, PA, January 10, 2011. [Breedlove (for Talavage)]

[23] "Use of Computer-Based Neurocognitive Testing to Identify Impairments in Patients Without Symptoms," *2011 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 1, 2011. [Leverenz, Talavage (for Nauman)]

[24] "Use of Computer-Based Neurocognitive Testing to Identify Impairments in Patients Without Symptoms," Kiwanis Club, West Lafayette, IN, February 24, 2011. [Leverenz, Nauman, Talavage]

[25] "Can We Play Football Safely? Lessons learned from studying High School football players," Carmel Chamber of Commerce, Carmel, IN, March 9, 2011. [Talavage, Breedlove]

[26] "Can We Play Football Safely? Lessons learned from studying High School football players," *Science on Tap Lafayette*, Lafayette, IN, April 21, 2011. [Leverenz, Nauman, Talavage]

[27] "Neurology and Neurotrauma Research at Purdue," *Big Ten/CIC Head Injury Summit*, Chicago, IL, April 30, 2011. [Nauman, Leverenz, Talavage]

[28] "Neuroimaging of Concussive and Subconcussive Injury: Probing Neurological Health in High School Athletes," *Speech and Hearing Biosciences Technology Program Seminar*, MIT-Harvard Division of Health Sciences and Technology, Cambridge, MA, May 31, 2011. [Talavage]

[29] "Acute Head Injury: Biomechanics," *21st Annual Practical Pediatrics for the Primary Care Physician*, St. Paul, MN, September 16, 2011. [Talavage]

[30] "How Many Hits is Too Many? Head Collisions in High School Football," *Silicon Valley Symposium*, San Francisco, CA, September 28, 2011. [Talavage]

[31] "CRASH: High School Football Head Injuries," *Purdue University President's Council "Back to Class*," September 30, 2011. [Leverenz, Nauman, Talavage]

[32] "Subconcussive Blows in High School Football: Identifying the Problem," Lafayette Rotary Club, West Lafayette, IN, October 4, 2011. [Leverenz, Talavage]

[33] "Biomechanical Linkage of History of Head Collisions to Neurophysiological Impairments in High School Athletes," *2011 Big Sky Athletic Training and Sports Medicine Conference*, Big Sky, MT, February 2, 2012. [Talavage, Nauman]

[34] "Neuroimaging of Concussive and Subconcussive Injury: Potential Clinical Application," *2012 Keystone Symposium on Clinical and Molecular Biology of Acute and Chronic Traumatic Encephalopathies*, Keystone, CO, February 27, 2012. [Talavage]

[35] "Sub-Concussive and Concussive mTBI in High School Contact Sport Athletes," *2012 Indiana Spinal Cord and Brain Injury Research Conference*, Indianapolis, IN, June 8, 2012. [Talavage]

[36] "Subconcussive Impacts in High School Athletes," Indiana Football Officials Association Clinic, Franklin, IN, June 23, 2012. [Leverenz, Talavage]

[37] "Sub-Concussive and Concussive mTBI in High School Contact Sport Athletes," *2012 Orthopedic Symposium for Physicians and Medical Professionals*, Methodist Sports Medicine, Indianapolis, IN, October 5, 2012. [Talavage]

[38] "How Many Hits is Too Many? Neurophysiological Consequences of Head Collisions in Football," *Delaware Center for Neuroscience Research Brain Buzz, a Public Talk,* Dover, DE, October 10, 2012. [Talavage]

[39] "Neuroimaging of Concussive and Subconcussive Injury: Probing Neurological Health in High School Athletes," Delaware State University, Dover, DE, October 11, 2012. [Talavage]

[40] "Sub-concussive and Concussive mTBI in Contact Sport Athletes," *Purdue West Coast Partnership "Discovery with Delivery" Symposium*, San Jose, CA, November 7, 2012. [Talavage]

[41] "Sub-concussive Impacts on High School Athletes," Purdue Alumni Association, Columbus, OH, May 29, 2013. [Leverenz, Talavage]

[42] "Imaging Effects of Sub-Concussive Blows in High School Athletes: Can We Play Sports Safely?" DeVault Otologic Research Laboratory, Indianapolis, IN, June 12, 2013. [Talavage]

[43] "MRI of mTBI in High School Collision Sports," *TBI Summer School*, Wayne State University, Detroit, MI, June 14, 2013. [Talavage]

[44] "Purdue Neurotrauma Group: Study of Collegiate Athletes 2013-2014," *Big Ten/CIC/Ivy League Summit on Traumatic Brain Injury*, Chicago, IL, July 18, 2013. [Talavage]

[45] "Pre-Clinical Neuroimaging of Repetitive Head Collisions in High School and Collegiate Athletes," General Electric Healthcare, Waukesha, WI, September 16, 2013. [Talavage, Leverenz]

[46] "Preventing Traumatic Brain Injury in High Impact Sports," *President's Colloquia at Westwood*, West Lafayette, IN, October 2, 2013. [Talavage]

[47] "Pre-Clinical Neuroimaging of Effects of Repetitive Blows to the Head in High School Athletes," *3rd Indiana Neuroimaging Symposium*, Bloomington, IN, October 25, 2013. [Talavage]

[48] "Sub-concussive Impacts in High School Athletes," *Science with a Twist*, Indianapolis, IN, February 20, 2014. [Leverenz, Nauman, Talavage]

[49] "From Cochlear Implants to Concussions: Using Imaging to Reshape Clinical Practice," Wright State University, Dayton, OH, March 19, 2014.

[50] "Functional MRI and Auditory Neurophysiology: Techniques, Findings and Implications," Northern Illinois University, DeKalb, IL, April 2, 2014.

[51] "Making Collision Sports Safer: Redefining Concussion and How We Treat Head Injuries," University of Puerto Rico-Mayaguez, Mayaguez, PR, April 10, 2014. [Talavage]

[52] "Concussions and Other Effects of Repetitive Head Blows in High School Athletes," Annual Retreat of the North Central Indiana School Study Council, Nashville, IN, June 27, 2014. [Talavage]

[53] "The Role of Medical Imaging in the Re-Characterization of Mild Traumatic Brain Injury," Indiana University, Bloomington, IN, March 2, 2015. [Talavage]

[54] "Engineering Healthier Brains: Re-shaping how youth sports affects brain health," Purdue University Sigma Xi Chapter, West Lafayette, IN, April 8, 2015. [Talavage]

[55] "Redefining Traumatic Brain Injury – Prevention, Protection, Repair," Purdue Alumni Club of Boone County, Thorntown, IN, April 28, 2015. [Leverenz, Nauman, Talavage]

[56] "Redefining Traumatic Brain Injury – Prevention, Protection, Repair," Purdue Alumni Club of Tippecanoe County, Lafayette, IN, June 17, 2015. [Leverenz, Nauman, Talavage]

[57] "Medical Imaging to Re-Characterize 'Concussion' for Improved Diagnosis and Prevention," *Concussion: A National Challenge*, National Academy of Engineering-Institute of Medicine Regional Meeting, Cleveland, OH, June 24, 2015. [Talavage]

[58] "Engineering Healthier Brains: Re-shaping how youth sports affects brain health," Scientech, Indianapolis, IN, August 17, 2015. [Talavage]

[59] "Toward Healthier Brains in Collision Sports: Medical Imaging and Health Monitoring," Ohio State University, Columbus, OH, September 24, 2015. [Talavage]

[60] "Application of Structural Health Monitoring for Characterization, Treatment and Prevention of Repetitive Strain Injuries in the Brain," *Concussion Neuroimaging Consortium Symposium*, Lincoln, NE, October 20, 2015. [Talavage, Nauman]

[61] "Engineering Healthier Brains: Re-shaping how youth sports affect brain health," *Rad Science: Skate Park Physics*, Indiana State Museum, Indianapolis, IN, October 22, 2015. [Leverenz, Nauman, Talavage]

[62] "Heads Up: Concussion in Contact Sports," 2016 Indiana Academy of Science Annual Meeting, Indianapolis, IN, March 26, 2016. [Leverenz, Nauman, Talavage]

[63] "Sub-Concussive Mild TBI in High School Athletes: A Neuroimaging Study," *From Biomechanics to Behavior: A Multidisciplinary Approach to Explosive and Concussive Traumatic Brain Injury*, Purdue University Integrative Neuroscience Center, West Lafayette, IN, May 11, 2016. [Talavage]

**Published Reviews:**

[1] Y. Fu, T.M. Talavage and J.X. Cheng, "New imaging techniques in the diagnosis of multiple sclerosis," *Expert Opinion on Medical Diagnosis* vol. 2, pp. 1055–1065, September 2008.

[2] J. Gonzalez-Castillo, O.A. Olulade and T.M. Talavage, "Using fMRI to Study Auditory Comprehension," *Imaging in Medicine* vol. 4, pp. 137-143, February 2012. {**Invited**}

[3] T.M. Talavage and D.A. Hall, "How Challenges in Auditory fMRI Led to General Advancements for the Field," *NeuroImage* Special Issue: Twenty Years of Functional MRI: The Science and the Stories, vol. 62, pp. 641-647, August 15, 2012. {**Invited**}

[4] T.M. Talavage, J. Gonzalez-Castillo and S.K. Scott, "Auditory Neuroimaging with fMRI and PET," *Hearing Research* vol. 307, pp. 4-15, January 2014. {**Invited**}

**Patents:**

[1] J.B. Laflen and T.M. Talavage, "Technique for High Spatial Resolution, Focused Electrical Stimulation of Electrically-Excitable Tissue," Patent #7,697,980, Issue Date: 13 April 2010.

[2] E. Nauman, E.L. Breedlove, A.D. Zakrajsek, T.M. Talavage, "Dynamic Load-Absorbing Materials and Articles." Patent #9,056,983, Issue Date: 16 June 2015.

**Invited Research Summary:**

[1] T.M. Talavage, "Medical Imaging to Recharacterize Concussion for Improved Diagnosis in Asymptomatic Athletes," in *The Bridge*, National Academy of Engineering, vol. 46, no. 1., pp. 85-90, Spring 2016. (Special issue: *Concussion: A National Challenge*)

**Activities as a Referee:**

*Conferences:*

[1] International Society for Magnetic Resonance in Medicine
[2] International Magnetics (INTERMAG)
[3] IEEE Engineering in Medicine and Biology Society
[4] Organization for Human Brain Mapping
[5] International Conference on Communications, Circuits and Systems
[6] International Conference on Image Processing
[7] International Symposium on Biomedical Imaging

*Journals:*

[1] Cerebral Cortex
[2] IEEE Transactions on Medical Imaging
[3] IEEE Transactions on Biomedical Engineering
[4] Human Brain Mapping
[5] NeuroImage
[6] Hearing Research
[7] Neuroscience Letters
[8] Journal of the Acoustical Society of America

[9] IEEE Transactions on Magnetics

[10] Brain Research

[11] Proceedings of the National Academy of Sciences USA

[12] Audiology and Neurootology

[13] Magnetic Resonance in Medicine

[14] Laser Surgery in Medicine

[15] Technology in Cancer Research and Treatment

[16] Journal of Speech, Language and Hearing Research

[17] Journal of Magnetic Resonance Imaging

[18] Journal of Magnetic Resonance

[19] Journal of Electronic Imaging

[20] Journal of Neurotrauma

[21] Concepts in Magnetic Resonance A

[22] Journal of Neuroscience Methods

[23] Medical Physics

[24] Sensors

[25] Frontiers in Neuroscience

[26] International Journal of Biomedical Imaging

[27] Brain Connectivity

[28] Developmental Neuropsychology

*Proposals:*

[1] NSF STS Program (2001)

[2] United States - Israel Binational Science Foundation (2006)

[3] NIH T90 (2006)

[4] NIH MEDI, invited reviewer (2007)

[5] NIH NIDCD F31/F32 (2007, 2013, 2014, 2015, 2016)

[6] NIH NIDCD Tinnitus (2008)

[7] NIH NIDCD R03 (2009, 2011)

[8] NIH NIDCD L30 (2010, 2012)

[9] NIH NIDCD SBIR (2011)

[10] NIH ANIE, mail reviewer (2012)

*Books:*

[1] Wiley Encyclopedia of Biomedical Engineering

*Theses:*

[1] External Reader, PhD Thesis, Swinburne University of Technology, Melbourne, Australia (2004, 06)

**Editorial Positions:**

[1] Associate Editor, *IEEE Transactions on Biomedical Engineering* (2011 – 2013)

**Short Courses and Workshops Attended:**

[1] Purdue University Racial Diversity Workshop, Fall 2000

[2] Neural Interfaces Workshop, National Institutes for Health, National Institute for Neurological Disorders and Stroke (NIH-NINDS), Bethesda, MD, November 15-17, 2004.

[3] Boston University-Cleveland Clinic Chronic Traumatic Encephalopathy Conference, Las Vegas, NV, October 2012. {**Invited Attendee**}

**Other Activities:**

*Administrative*

[1] Area Chair, Communications, Networking, Signal and Image Processing (2006 – 2012)

[2] Area Chair, Biomedical Imaging and Sensing (2012 – Present)

[3] Member, Working Group on Concussion Research, Committee on Institutional Cooperation (CIC) (2011 – Present)

[4] Member, NCAA Concussion Task Force (2013 – Present)

[5] Scientific Advisory Board Member, NCAA-DOD CARE Consortium (2014 – Present)

[6] Member, Concussion Neuroimaging Consortium (2014 – Present)

*Advising*

- Student Organizations

[1] Tau Beta Pi (Indiana Alpha Chapter): Advisor (1999 – 2009)

[2] Purdue University IEEE Student Chapter: Branch Counselor (1999 – 2007)

[3] Eta Kappa Nu (Beta Chapter): Advisor (2000 – 2001), Head Advisor (2001 – Present)

- Academic Programs

[1] Mentor, HORIZONS Student Support Program, Purdue University, Fall 2007, 2008.

*Conference Oral Session Moderator*

[1] *26th Annual International Conference of the IEEE EMBS* (2004)

[2] *VIII International Conference on Cochlear Implants* (2004)

[3] *28th Annual International Conference of the IEEE EMBS* (2006)

[4] *Computational Imaging V* (2007)

[5] *16th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine* (2008)

[6] Educational Session Moderator, *Absolute Beginner's Guide*, at the *19th Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine* (2011)

*Internal Workshops and Symposiums*

[1] Co-Chair, Neuroimaging Symposium, *26th Annual International Conference of the IEEE EMBS* (2004)

[2] Coordinator, Medical Imaging Track, Healthcare Engineering Workshop, Purdue University, 26 September 2006

[3] Co-Organizer and Moderator, Purdue MRI Facility Dedication Symposium, 2 November 2007.

*Research Coverage in the Media*

[1] J. Krizen, "Purdue and Jeff High School teaming up," WLFI Channel 18 News, West Lafayette, IN, 7 August 2009.

[2] E. Weddle, *Lafayette Journal & Courier*, 21 August 2009.

[3] K. Mayer, "Head Injury Study Scores Early Touchdown," *Purdue ECE Impact*, Spring 2010.

[4] A. Deiro, "Football hits affect without symptoms," WLFI Channel 18 News, West Lafayette, IN, 3 October 2010.

[5] D. Rancken & B. Petrie, KRLD 1080, Dallas, TX, 4 October 2010. [Live interview]

[6] R. Huppke, "Friday night lights' risk: 1,800 hits to the head: New study warns of undiagnosed brain injuries in high school players," *Chicago Tribune/Los Angeles Times*, 6 October 2010.

[7] N. Baird, "Purdue study sheds light on football-related trauma," *Lafayette Journal & Courier*, 7 October 2010.

[8] N. Newell, "Study: Brain damage possible without concussion symptoms," *Indianapolis Star*, 7 October 2010.

[9] D. MacAnally, "Purdue researchers track football concussions," WTHR Channel 13 News, Indianapolis, IN, 8 October 2010.

[10] S. Klemet, WBAA 920 News, West Lafayette, IN, 27 October 2010.

[11] J. Staysniak, *The Big Joe Show*, 1070 "The Fan", Indianapolis, IN, 27 October 2010.

[12] R. Bazell, "Sports Illustrated puts football's hard hits in hot seat," *NBC Nightly News*, 27 October 2010. (http://www.nbcnews.com/video/nightly-news/39879251#39879251)

[13] R. Bazell, "Brain Injuries in High School Football Players Under Scrutiny," *NBC Nightly News*, 27 October 2010. (http://www.nbcnews.com/video/nightly-news/39875962#39875962)

[14] S. Sandsberry, "Gray Matter: Attitudes toward brain injuries changing with more knowledge," *Yakima (WA) Herald*, 29 October 2010.

[15] D. Spehler, "Research measures power of football hits," WRTV Channel 6 News, Indianapolis, IN, 29 October 2010.

[16] D. Epstein, "The Damage Done," *Sports Illustrated*, 1 November 2010. **[Cover article]**

[17] P. King, "Monday Morning Quarterback," sportsillustrated.cnn.com, 1 November 2010.

[18] R. Meyer, "Head Games," *InfoTrak*, TalkZone Talk Channel, 5 November 2010.

[19] W. Forrest, "fMRI gauges concussions in high school football players," AuntMinnie.com, 22 November 2010.

[20] H. Feldmeyer, "Changes found in football players thought to be concussion-free," *BoilerBytes*, BigTen Network, 23 November 2010. (http://www.purdue.edu/boilerbytes/index.php?id=XKNm6YvWpwg)

[21] L. Collier Cool, "Brain changes found in football players without concussion," www.healthyimagination.com, 29 November 2010.

[22] "Blows to the Brain: Insight from Tragedy," *GE Signa PULSE*, Fall 2010.

[23] S. Vedantam, "The National Brain-Damage League," *Slate.com*, 18 January 2011.

[24] G. Easterbrook, "Tuesday Morning Quarterback," sports.espn.go.com, 8 February 2011.

[25] T. Schultz, "Purdue professor advises parents about sports concussions," *Indianapolis Star*, 10 March 2011.

[26] "Football High" (www.pbs.org/wgbh/frontline/football-high) *Frontline*, 12 April 2011.

a. http://www.pbs.org/wgbh/pages/frontline/football-high/interviews/tom-talavage.html (*transcript of interview*)

b. http://www.pbs.org/wgbh/pages/frontline/football-high/live-chat-dretzin-talavage-casa (*transcript of live on-line chat*)

[27] D. Epstein, "Unique study explores cumulative effect of hits in high school football," *SportsIllustrated.CNN.com*, 13 April 2011.

[28] R. Patnaik, "Study on football concussions looks at how early damage can be done to players," *Purdue Exponent*, 25 April 2011.

[29] T. Nunez, "Lesser blows now the big concern with regard to concussions," *New Orleans Times-Picayune*, 22 June 2011.

[30] T. Nunez, "Athletic trainers give their brains a workout for a winning edge," *New Orleans Times-Picayune*, 25 June 2011.

[31] S. Cameron, KCTV-5, Kansas City, MO, 15 July 2011. [Satellite Interview]

[32] D. Edwards and J. Green, "Life after football," *Hamilton (Ontario) Spectator*, 6 August 2011.

[33] S. Jansen and G. Garcia-Roberts, "Knocked Out: Medical effects of concussion far worse for kids," *Houston Press,* 17 August 2011.

[34] M. Lazerus, "Concussions in football: The long-term impact," *(Merrillville) Post-Tribune,* 18 August, 2011.

[35] N. Baird, "By analyzing violent hits, researchers at Purdue hope to reduce concussions," *Lafayette Journal & Courier,* 19 August 2011.

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[37] R. Brady and D. McGinn, "Concussion awareness spreading in high school football," *The (Toronto, Ontario) Globe and Mail,* 19 September 2011.

[38] K. Veleta, "Researchers Uncover Hidden Impact of Football Concussions," *Life Sciences INdiana*, 29 September 2011.

[39] M. Gunn, *TechNation*, KQED/National Public Radio, San Francisco, CA, 8 October 2011.

[40] J. Doherty, "Silence no option with Purdue head work," *The (Northwest Indiana) Times,* 7 November 2011.

[41] K. Thompson, "West Lafayette graduate defines student-athlete," *Lafayette Journal & Courier,* 28 November 2011.

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[43] D.Z. Jackson, "The black hole of sports," *The Boston Globe*, 8 January 2012, p. C.11.

[44] K. Hamalainen, "Head to Head," *Scholastic Science World,* 23 January 2012, pp. 14-17.

[45] S. Curtiss, "From Science to Sport," *The Weekly Special Super Bowl Spectacular*, WTIU Channel 30, Bloomington, IN, 2 February 2012.

[46] M. McMillen, "Little blows to head add up to big risk," *WebMD Health News*, 3 February 2012.

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[48] Z. Tong, "Football Concussions," *DailyPlanet,* Discovery Channel Canada, 6 February 2012. (http://watch.discoverychannel.ca/daily-planet/february-2012/daily-planet---february-06-2012/#clip614063; 03:40-09:40)

[49] E. Rentschler, "Football players experience 200 lb. hits to the head," WLFI Channel 18 News, West Lafayette, IN, 8 February 2012.

[50] E. Hartman, "Purdue research group studies impacts of concussions," *Purdue Exponent,* 10 February 2012.

[51] M. Oriard and T. Trigsted, Sanctioned Savagery: The Untold Story of American Football, screened at The 2nd Annual Santa Clara Valley Brain Injury Conference, 23-25 February 2012.

[52] K. Stack, "Concussion-Sensing Chin Strap Raises Questions," *WIRED Magazine Online*, 26 March, 2012.

[53] J. Burroughs, KCSN radio, Northridge, CA, 13 March 2012. [Phone Interview]

[54] L.A. Richardson, "Helmet research is resulting in reduction and prevention of brain injury," *BoilerBytes*, 17 April 2012. (http://www.purdue.edu/boilerbytes/index.php?id=-DlSd8I8rpE)

[55] G. Gross, KKSF 910 radio, San Francisco, CA, 4 May 2012. [Live interview]

[56] S. Matthews, "Researchers Uncover Hidden Impact of Football Concussions," WRTV Channel 6 News, Indianapolis, IN, 4 May 2012.

[57] D. MacAnally, "Purdue Helmet Liner Designed to Mitigate Football Head Injuries," WTHR Channel 13 News, Indianapolis, IN, 5 May 2012.

[58] B. Wilhelm, *The Sports Exchange*, WATD 95.9 FM, Marshfield, MA, 1 July 2012. [Live interview]

[59] S. Greene, WDEL 1150 AM, Wilmington, DE, 8 October, 2012.

[60] B. Goldberg, "Your Brain on Football," *HBO Real Sports with Bryant Gumbel*, 20 November 2012.

[61] K. Erdahl, "Purdue researchers: Seau brain disease offers lesson football players, parents", WXIN Channel 59 News, Indianapolis, IN, 11 January 2013.

[62] M. Slaby, "Seau report backs Purdue conclusions", *Lafayette Journal & Courier*, 12 January 2013.

[63] E. Rentschler, "Is there a 'safe' number of hits?" WLFI Channel 18 News, West Lafayette, IN, 14 January 2013.

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[65] D. Thomas, "Purdue researchers develop helmet technology to better protect brain", WRTV Channel 6 News, Indianapolis, IN, 30 January 2013.

[66] S. Lehr, "New football helmet technology can decrease G-force", WIBC 93.1FM, Indianapolis, IN, 31 January 2013.

[67] R. Van Wyk, "Purdue researchers unveil new helmet to limit football concussions", WTHR Channel 13 News, Indianapolis, IN, 7 February 2013.

[68] B. Benner, "Professors Patent New Football Helmet Liner", *Inside Indiana Business with Gerry Dick*, 10 February 2013.

[69] J. Keilman, "State lawmaker wants to limit tackling during high school football practice", *Chicago Tribune*, 11 February 2013.

[70] C. Dietz, “New football helmet liner developed by Purdue University engineers”, WFHB 91.3FM, Bloomington, IN, 15 February 2013.

[71] T. Mackin, “Purdue researchers study brains of college football players”, WISH Channel 8 News, Indianapolis, IN, 28 August 2013.

[72] K. Erdahl, “Neurotrauma researchers to evaluate Purdue football injuries”, WXIN Channel 59 News, Indianapolis, IN, 28 August 2013.

[73] C. Walser, “Scientists study Purdue football team for concussion research”, WRTV Channel 6 News, Indianapolis, IN, 30 August 2013.

[74] D. MacAnally, “High schools keep closer eye on possible concussions”, WTHR Channel 13 News, Indianapolis, IN, 31 August 2013.

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[76] D. MacAnally, “Purdue collecting concussion data from soccer players”, WTHR Channel 13 News, Indianapolis, IN, 4 September 2013.

[77] W. Meiners, “The Purdue Neurotrauma Group could help revolutionize football through safer helmet technology”, *Purdue Alumnus Magazine*, vol. 102, Sept/Oct 2013.

[78] J. Schmidt, “Sensors in Purdue football helmets help improve health research”, *Purdue Exponent*, 16 September 2013.

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[80] S. Thieke, “Hits on athletes are harder than you think,” WLFI Channel 18 News, West Lafayette, IN, 29 May 2014.

[81] R. Van Wyk, “Purdue, IU research gives new look at concussions,” WTHR Channel 13 News, Indianapolis, IN, 30 May 2014.

[82] L. Cordes, “Concussion: Research reveals startling facts,” *Purdue Exponent*, West Lafayette, IN, 14 July 2014.

[83] J. Cooley, The Impact of Cody Lehe, Bloomington, IN: InspiringVoices; 11 September 2014.

[84] S. Ingle, "American football can no longer ignore dangers of trauma,” *Guardian*, London, UK, 21 September 2014.

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[90] B. Bell and R. Krause, "Study finds some non-concussive head injuries in athletes go unnoticed," WKCAU Channel 9 News , Sioux City, IA, 9 October 2015. (http://www.siouxlandmatters.com/news/local-news/study-finds-some-non-concussive-head-injuries-in-athletes-go-unnoticed)

[91] S. Gregory, "Why We Need Hit Counts in Football," Time Magazine, 12 October 2015. (http://time.com/4069037/football-brain-injury-hit-counts-cte/)

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[96] K. Sanders, *Andrea Mitchell Reports*, MSNBC, 12 November 2015. [Live interview]

[97] K. Sanders, *Live with Thomas Roberts*, MSNBC, 12 November 2015. [Live interview]

[98] K. Sanders, "Heading a Soccer Ball Is Like Dropping a Brick on Your Head," NBC News, 12 November 2015. (http://www.nbcnews.com/feature/short-take/video/heading-a-soccer-ball-is-like-dropping-a-brick-on-your-head-565706819620)

[99] S. Fainaru and M. Fainaru-Wada, "NFL backs away from funding BU brain study; NIH to fund it instead," ESPN.com, 22 December 2015. (http://espn.go.com/espn/otl/story/_/id/14417386/nfl-pulls-funding-boston-university-head-trauma-study-concerns-researcher)

[100] K. Sullivan, "Purdue researchers respond to the movie 'Concussion'," WLFI Channel 18 News, West Lafayette, IN, 25 December 2015. (http://wlfi.com/2015/12/25/purdue-researchers-respond-to-the-movie-concussion)

[101] K. Veleta, "Purdue Head Injury Experts Must Raise Money to Remain Independent," *Life Sciences INdiana*, 28 January 2016. (http://www.insideindianabusiness.com/story/31079920/purdue-head-injury-experts-must-raise-money-to-remain-independent)