

# DR. ERVIN SEJDIĆ, Ph.D.

*Curriculum Vitae*

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## PERSONAL INFORMATION

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Work Address	Home Address
Department of Electrical and Computer Engineering	5 Bayard Road, Apt. 612
University of Pittsburgh	Pittsburgh, PA, 15213, USA
Pittsburgh, PA 15261, USA	Cell: 412-298-0390
Tel: 412-624-0508	
E-mail: <a href="mailto:esejdic@ieee.org">esejdic@ieee.org</a>	
Web: <a href="http://www.imedlab.org">www.imedlab.org</a>	
Twitter: @DrErvinSejdic and @iMEDLaboratory	
Facebook: @DrErvinSejdic	

## EDUCATION

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2010 – 2011	<b>Harvard University, Boston, MA, USA</b> Research Fellowship in Medicine RESEARCH AREA: Cardiovascular and Cerebrovascular Monitoring of Older Diabetic Adults
2008 – 2010	<b>University of Toronto, Toronto, Ontario, Canada</b> Postdoctoral Training RESEARCH AREA: Rehabilitation Engineering and Biomedical Instrumentation
2003 – 2008	<b>The University of Western Ontario, London, Ontario, Canada</b> Doctor of Philosophy in Electrical Engineering, THESIS TITLE: Feature Representation Using Energy Concentration in Time-Frequency Domain For Extraction and Classification (defended in Dec. 2007)
2002 – 2003	<b>The University of Western Ontario, London, Ontario, Canada</b> Master of Engineering Science in Electrical Engineering (transferred to Ph.D. program), RESEARCH AREA: Time-Frequency Analysis of Heart Sounds
1998 – 2002	<b>The University of Western Ontario, London, Ontario, Canada</b> Bachelor of Engineering Science in Electrical Engineering - Wireless Communication

## RESEARCH EXPERIENCE/APPOINTMENTS

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Sep 2017 – Present	<b>Associate Professor (tenured)</b> , Department of Electrical and Computer Engineering, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
Sept 2017 – Present	<b>Associate Professor</b> , Department of Bioengineering, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
Sept 2017 – Present	<b>Associate Professor</b> , Department of Biomedical Informatics, School of Medicine, University of Pittsburgh, Pittsburgh, PA, USA
Sept 2017 – Present	<b>Associate Professor</b> , Intelligent Systems Program, Kenneth P. Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA, USA
Sept 2017 – Present	<b>Director</b> , Center for Networked Processing, Learning, Understanding and Sensing, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA

- Sept 2012 – Aug 2017 **Associate Director**, RFID Center of Excellence, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- Sep 2011 – Aug 2017 **Assistant Professor**, Department of Electrical and Computer Engineering, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- Sept 2012 – Aug 2017 **Assistant Professor**, Department of Bioengineering, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- July 2013 – Aug 2017 **Assistant Professor**, Department of Biomedical Informatics, School of Medicine, University of Pittsburgh, Pittsburgh, PA, USA
- Oct 2013 – Aug 2017 **Assistant Professor**, Intelligent Systems Program, Kenneth P. Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA, USA
- Oct 2010 – Dec 2012 **Adjunct Scientist**, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, Toronto, Ontario, Canada
- July 2010 – June 2011 **Research Fellow in Medicine**, Division of Gerontology, Beth Israel Deaconess Medical Center and Harvard Medical School, Harvard University, Boston, MA, USA
- Feb 2008 – June 2010 **Postdoctoral Fellow**, Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital and the Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada
- May 2002 – Jan 2008 **Research Assistant**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- June 2005 – July 2005 **Visiting Researcher**, Time-Frequency Signal Analysis Group, Center for Signals, Systems, and Information Theory, Electrical Engineering Department, University of Montenegro, Podgorica, Montenegro
- May 2001 – Sept 2001 **Research Assistant**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- May 2000 – Sept 2000 **Research Assistant**, Department of Applied Mathematics, The University of Western Ontario, London, Ontario, Canada

## PROFESSIONAL/ACADEMIC HONOURS AND AWARDS

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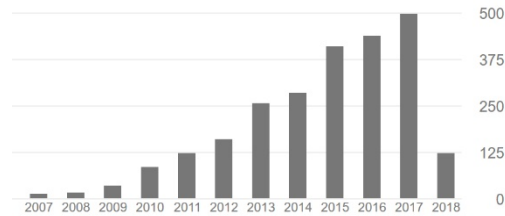
- 2018 Chancellor's Distinguished Research Award (Junior Scholar)  
University of Pittsburgh
- 2017 – 2021 Fulton C. Noss Faculty Fellow  
University of Pittsburgh
- 2017 – 2022 National Science Foundation  
CAREER: The Faculty Early Career Development Award
- 2016 Barack Obama, President of the United States  
Presidential Early Career Award for Scientists and Engineers
- 2010 Institute for Aging Research, Hebrew Senior Life  
Melvin First Young Investigator's Award
- 2005 – 2007 Natural Sciences and Engineering Research Council of Canada  
Postgraduate Scholarship D2
- 2005 - 2007 The University of Western Ontario  
Western Graduate Research Scholarship

- 2006 Dept. of Electrical and Computer Engineering, The University of Western Ontario  
Award for Outstanding Presentation in Graduate Symposium 2006
- 2003 – 2005 Natural Sciences and Engineering Research Council of Canada  
Postgraduate Scholarship
- 2003 – 2005 The University of Western Ontario  
Graduate Research Scholarship
- 2002 The University of Western Ontario  
Graduated with Distinction
- 1999 – 2002 Faculty of Engineering, The University of Western Ontario  
Dean's Honours List
- 1998 The University of Western Ontario  
Admission Scholarship

## SCHOLARLY CONTRIBUTIONS

**PA – Principal Author; SRA - Senior Responsible Author; CPA - Co-Principal Author; CA – Contributing Author**

	All	Since 2013
Citations	2475	2015
h-index	26	21
i10-index	56	51



### BOOKS

1. E. Sejdić and T. H. Falk, Eds., *Signal Processing and Machine Learning for Biomedical Big Data*, New York: CRC Press, 2018. **PA**
2. S. Stanković, I. Orović, E. Sejdić, *Multimedia Signals and Systems: Basic and Advanced Algorithms for Signal Processing*. New York: Springer, 2016. **CA**
3. S. Stanković, I. Orović, E. Sejdić, *Multimedia Signals and Systems*. New York: Springer, 2012. **CA**
4. E. Sejdić, I. Djurović, J. Jiang, L.J. Stanković, *Time-Frequency Based Feature Extraction and Classification: Considering Energy Concentration as a Feature Using Stockwell Transform and Related Approaches*. Saarbrücken, Germany: VDM Verlag Publishing, 2009. **PA**

### BOOK CHAPTERS

1. N. A. Khan, E. Sejdić, B. Boashash, "Adaptive Directional Time-Frequency Distributions," in *Time-Frequency Signal Analysis and Processing: A Comprehensive Reference*. B. Boashash, Eds. Second Edition, Academic Press, 2016, pp. 299-307. **CA**
2. E. Sejdić, "Time-Frequency Compressive Sensing," in *Time-Frequency Signal Analysis and Processing: A Comprehensive Reference*. B. Boashash, Eds. Second Edition, Academic Press, 2016, pp. 424-430. **PA**
3. E. Sejdić, S. Aviyente, B. Boashash, "Time-Varying Analysis of Brain Networks," in *Time-Frequency Signal Analysis and Processing: A Comprehensive Reference*. B. Boashash, Eds. Second Edition, Academic Press, 2016, pp. 937-963. **PA**
4. S. J. Haghighi, S. Primak, V. Kontorovich, E. Sejdić, "Wireless Communications and Multitaper Analysis: Applications to Channel Modelling and Estimation," in *Mobile and Wireless Communications Physical Layer Development and Implementation*. S. A. Fares and F. Adachi, Eds. Vienna, Austria: I-Tech Education and Publishing, 2010, pp. 25-46. **CA**
5. T. H. Falk, W-Y. Chan, E. Sejdić, T. Chau, "Spectro-Temporal Analysis of Auscultatory Sounds," in *New Developments in Biomedical Engineering*. D. Campolo, Ed. Vienna, Austria: I-Tech Education and Publishing, 2010, pp. 93-104. **CA**
6. E. Sejdić, J. Jiang, "Pattern Recognition in Time-Frequency Domain: Selective Regional Correlation and Its Applications," in *Pattern Recognition Techniques, Technology and Applications*. P.-Y. Yin, Ed. Vienna, Austria: I-Tech Education and Publishing, 2008, pp. 613-626. **PA**

**REFEREED JOURNAL PUBLICATIONS (trainees underlined)**

Journal	Impact factor 2017
AEU International Journal of Electronics and Communications	1.147
Aging Clinical and Experimental Research	1.394
Annals of Biomedical Engineering	3.221
Behavioral and Brain Functions	2.207
Behavioural Brain Research	3.002
Biomedical Engineering Online	1.683
BMC Medical Imaging	1.060
Brain Research	2.746
Brain Structure and Function	4.698
Biomedical Signal Processing and Control	2.214
Cognitive Neurodynamics	1.828
Comparative Medicine	0.832
Computers in Biology and Medicine	1.836
Computer Methods and Programs in Biomedicine	2.503
Diabetes Care	11.857
Digital Signal Processing	2.337
Dysphagia	2.077
Electronics Letters	1.155
Energy Technology	2.789
EURASIP Journal on Advances in Signal Processing	1.961
Fertility and Sterility	4.373
Folia Phoniatica et Logopaedica	0.417
Gait and Posture	2.347
Human Movement Science	1.841
IEEE Journal of Biomedical and Health Informatics	3.451
IEEE Sensors Journal	2.512
IEEE Signal Processing Letters	2.528
IEEE Signal Processing Magazine	9.654
IEEE Transactions on Biomedical Engineering	3.577
IEEE Transactions on Human-Machine Systems	2.493
IEEE Transactions on Microwave Theory and Techniques	2.897
IEEE Transactions on Neural Systems and Rehabilitation Engineering	3.410
IEEE Transactions on Signal Processing	4.300
IEEE Transactions on Systems, Man and Cybernetics, Part A	2.350
IET Signal Processing	1.298
JAMA Neurology	10.029
Journal of the American Geriatrics Society	4.388
Journal of Electrocardiology	1.514
Journal of Medical Systems	2.456
Journal of Neural Engineering	3.465
Journal of NeuroEngineering and Rehabilitation	3.516

Journal of Neuroscience Methods	2.554
Journal of Stroke and Cerebrovascular Diseases	1.517
Mechanical Systems and Signal Processing	4.116
Medical and Biological Engineering and Computing	1.916
Medical Engineering & Physics	1.819
Medical Hypotheses	1.066
Menopause	2.733
Nature	40.137
Neurocomputing	3.317
Neurorehabilitation and Neural Repair	4.107
Neuroscience	3.277
Neuroscience Letters	2.180
Neuroscience Research	2.060
Pediatric Exercise Science	1.704
Physica D: Nonlinear Phenomena	1.514
Physiological Measurement	2.058
Plastic and Reconstructive Surgery	3.784
PLoS ONE	2.806
Scientific Reports	4.259
Sensors	2.677
Signal Processing	3.110
Ultrasound in Medicine and Biology	2.494

1. K. N. Bocan, M. H. Mickle, E. Sejdić, "Simulating, modeling, and sensing variable tissues for wireless implantable medical devices" *IEEE Transactions on Microwave Theory and Techniques*, accepted, 2018. **SRA**
2. M. Montero-Odasso, M. Speechley, S. W. Muir-Hunter, Y. Sarquis-Adamson, L. A. Sposato, V. Hachinski, M. Borrie, J. Wells, A. Black, E. Sejdić, L. Bherer, H. Chertkow, "Motor and cognitive trajectories before dementia: Results from Gait and Brain Study," *Journal of the American Geriatrics Society*, accepted, 2018. **CA**
3. J. M. Dudik, J. L. Coyle, A. El-Jaroudi, Z.-H. Mao, M. Sun, E. Sejdić, "Deep learning for classification of normal swallow in adults," *Neurocomputing*, accepted, 2018. **SRA**
4. M. A. Rothfuss, N. G. Franconi, A. Star, M. Akcakaya, M. L. Gimbel, E. Sejdić, "Automatic early-onset free flap failure detection for implantable biomedical devices" *IEEE Transactions on Biomedical Engineering*, accepted, 2018. **SRA**
5. M. A. Rothfuss, N. G. Franconi, K. N. Bocan, J. V. Unadkat, M. L. Gimbel, M. H. Mickle, E. Sejdić, "Implantable energy harvesting stents for transcatheter wireless monitoring of peripheral artery disease" *IEEE Sensors Journal*, accepted, 2017. **SRA**
6. Lj. Stanković, E. Sejdić, M. Daković, "Vertex-frequency energy distribution" *IEEE Signal Processing Letters*, accepted, 2017. **CA**
7. M. A. Rothfuss, M. L. Gimbel, E. Sejdić, "Automatic patency discrimination in the pig bilateral femoral veins for biomedical implants" *IEEE Sensors Journal*, accepted, 2017. **SRA**
8. I. Jestrović, J. L. Coyle, S. Perera, E. Sejdić, "Influence of attention and bolus volume on brain organization during swallowing" *Brain Structure and Function*, accepted, 2017. **SRA**

9. A. Khalaf, M. Sybeldon, E. Sejdić, M. Akcakaya, "A brain-computer interface based on functional transcranial Doppler ultrasound using wavelet transform and support vector machines," *Journal of Neuroscience Methods*, accepted, 2017. **CA**
10. N. Seth, H. Simmons, F. Masood, W. A. Graham, D. L. Rosene, S. Westmoreland, S. Macri, B. Gwardjan, E. Sejdić, A. Hoggatt, D. R. Schalk, H. A. Abdullah, J. B. Sledge, S. Nesathurai, "Evidence from a non-human primate model of traumatic spinal cord injury in cynomolgus macaques (*Macaca fascicularis*) to evaluate for the efficacy of a combination pharmacological treatments" *Comparative Medicine*, accepted, 2017. **CA**
11. E. Sejdić, I. Orović, S. Stanković, "Compressive sensing meets time-frequency: An overview of recent advances in time-frequency processing of sparse signals," *Digital Signal Processing*, accepted, 2017. **PA**
12. E. Sejdić, I. Orović, S. Stanković, "A software companion for compressively sensed time-frequency processing of sparse nonstationary signals," *SoftwareX*, accepted, 2017. **PA**
13. F. Movahedi, J. L. Coyle, E. Sejdić, "Deep belief networks for electroencephalography: A review of recent contributions and future outlooks" *IEEE Journal of Biomedical and Health Informatics*, accepted, 2017. **SRA**
14. S. Al-Zaiti, E. Sejdić, J. Nemec, C. Callaway, P. Soman, R. Lux, "Spatial indices of repolarization correlate with non-ST evaluation myocardial ischemia in patients with chest pain," *Medical and Biological Engineering and Computing*, accepted, 2017. **CA**
15. B. A. Alqahtani, M. A. Ferchak, T. J. Huppert, E. Sejdić, S. Perera, S. L. Greenspan, P. J. Sparto, "Standing balance and strength measurements in older adults living in residential care communities," *Aging Clinical and Experimental Research*, vol. 29, no. 5, pp. 1021-1030, Oct. 2017. **CA**
16. K. B. Bocan, M. H. Mickle, E. Sejdić, "Multi-disciplinary challenges in tissue modeling for wireless electromagnetic powering: A review" *IEEE Sensors Journal*, vol. 17, no. 20, pp. 6498-6509, Oct 2017. **SRA**
17. L. Gurbeta, Z. Džemić, T. Bego, E. Sejdić, A. Badnjević, "Testing of anesthesia machines and defibrillators in healthcare institutions," *Journal of Medical Systems*, vol. 41, no. 9, pp. 133-1-10, Sept. 2017. **CA**
18. K. B. Bocan, M. H. Mickle, E. Sejdić, "Tissue variability and antennas for power transfer to wireless implantable medical devices" *IEEE Journal of Translational Engineering in Health and Medicine*, vol. 5, pp. 2700111-1-11, Aug. 2017. **SRA**
19. A. Gatouillat, A. Dumortier, S. Perera, Y. Badr, C. Gehin, E. Sejdić, "Analysis of the pen pressure and grip force signal during basic drawing tasks: the timing and speed changes impact drawing characteristics" *Computers in Biology and Medicine*, vol. 87, pp. 124-131, Aug. 2017. **SRA**
20. M. Montero-Odasso, Y. Sarquis-Adamson, M. Speechley, M. Borrie, V. Hachinski, J. Wells, P. M. Riccio, M. Schapira, E. Sejdić, R. Camicioli, R. Bartha, W. McIlroy, S. W. Muir-Hunter, "Dual-task gait predicts incident dementia in mild cognitive impairment: Results from the Gait and Brain Study," *JAMA Neurology*, vol. 74, no. 7, pp. 857-865, July 2017. **CA**
21. Lj. Stanković, M. Daković, E. Sejdić, "Vertex-frequency analysis: A way to localize graph spectral components," *IEEE Signal Processing Magazine*, vol. 34, no. 4, pp. 176-182, July 2017. **SRA**
22. F. Movahedi, A. Kurosu, J. L. Coyle, S. Perera, E. Sejdić "A comparison between swallowing sounds and vibrations in patients with dysphagia," *Computer Methods and Programs in Biomedicine*, vol. 144, pp. 179–187, June 2017.



23. F. Movahedi, A. Kurosu, J. L. Coyle, S. Perera, E. Sejdić “Anatomical directional dissimilarities in tri-axial swallowing accelerometry signals,” *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 25, no. 5, pp. 447-458, May 2017. **SRA**
24. M. A. Rothfuss, J. V. Unadkat, M. L. Gimbel, M. H. Mickle, E. Sejdić, “A review of totally implantable wireless ultrasonic Doppler blood flowmeters: towards accurate miniaturized chronic monitors,” *Ultrasound in Medicine and Biology*, vol. 43, no. 4, pp. 561-578, Mar. 2017. **SRA**
25. I. Jestrović, J. L. Coyle, E. Sejdić, “Differences in brain networks during consecutive swallows detected using an optimized vertex-frequency algorithm,” *Neuroscience*, vol. 344, pp. 113-123, Mar. 2017. **SRA**
26. H. T. Karim, T. J. Huppert, K. I. Erickson, M. E Wollam, P. J. Sparto, E. Sejdić, J. M. VanSwearingen, “Motor sequence learning-induced neural efficiency in functional brain connectivity” *Behavioural Brain Research*, vol. 319, pp. 87-95, Feb. 2017. **CA**
27. I. Jestrović, J. L. Coyle, E. Sejdić, “A fast algorithm for vertex-frequency representations of signals on graphs,” *Signal Processing*, vol. 131, pp. 438-491, Feb. 2017. **SRA**
28. Z. Zhang, J. Van Swearingen, J. S. Brach, S. Perera, E. Sejdić, “Most suitable mother wavelet for the analysis of fractal properties of stride interval time series via the average wavelet coefficient method,” *Computers in Biology and Medicine*, vol. 80, pp. 175-184, Jan. 2017. **SRA**
29. V. Rubežić, I. Djurović, E. Sejdić, “Average wavelet coefficient-based detection of chaos in oscillatory circuits,” *COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering*, vol. 36, no. 1, 2017. **CA**
30. A. Dumortier, E. Beckjord, S. Shiffman, E. Sejdić, “Classifying smoking urges via machine learning,” *Computer Methods and Programs in Biomedicine*, vol. 137, pp. 203-213, Dec. 2016. **SRA**
31. I. Jestrović, J. L. Coyle, S. Perera, E. Sejdić, “Functional connectivity patterns of normal human swallowing: difference among various viscosity swallows in normal and chin-tuck head positions,” *Brain Research*, vol. 1652, pp. 158-169, Dec. 2016. **SRA**
32. M. A. Rothfuss, N. G. Franconi, J. V. Unadkat, M. L. Gimbel, A. Star, M. H. Mickle, E. Sejdić, “A system for simple real-time anastomotic failure detection and wireless blood flow monitoring in the lower limbs” *IEEE Journal of Translational Engineering in Health and Medicine*, vol. 4, pp. 4100114-1-15, 2016. **SRA**
33. J. M. Dudik, J. L. Coyle, A. El Jaroudi, M. Sun, E. Sejdić “A matched dual-tree wavelet denoising for tri-axial swallowing vibrations,” *Biomedical Signal Processing and Control*, vol. 27, pp. 112-121, May 2016. **SRA**
34. K. Bocan, E. Sejdić “Adaptive transcutaneous power transfer to implantable devices: A state of the art review,” *Sensors*, vol. 16, no. 3, pp. 393-1-23, March 2016. **SRA**
35. H. Bleton, S. Perera, E. Sejdić “Cognitive tasks and cerebral blood flow through anterior cerebral arteries: A study via functional transcranial Doppler ultrasound recordings,” *BMC Medical Imaging*, vol. 16, pp. 22-1-12, 2016. **SRA**
36. J. M. Dudik, A. Kurosu, J. L. Coyle, E. Sejdić, “A statistical analysis of cervical auscultation signals from adults with unsafe airway protection,” *Journal of NeuroEngineering and Rehabilitation*, vol. 13, pp. 7-1-10, 2016. **SRA**
37. A. Sethi, E. Skidmore, E. Sejdić, L. Terhorst, C. Callaway, “Heart rate variability is associated with motor outcome 3-month after stroke,” *Journal of Stroke and Cerebrovascular Diseases*, vol. 25, no. 1, pp.129-135, Jan. 2016. **CA**

38. R. C. Thurston, H. J. Aizenstein, C. A. Derby, E. Sejdić, P. M. Maki, "Menopausal hot flashes and white matter hyperintensities," *Menopause*, vol. 23, no. 1, pp. 27-32, Jan. 2016. **CA**
39. E. Sejdić, K. A. Lowry, J. Bellanca, S. Perera, M. S. Redfern, J. S. Brach, "Extraction of stride events from gait accelerometry during treadmill walking," *IEEE Journal of Translational Engineering in Health and Medicine*, vol. 4, pp. 2100111-1-11, 2016. **PA**
40. E. Sejdić, A. Millecamps, J. Teoli, M. A. Rothfuss, N. G. Franconi, S. Perera, A. K. Jones, J. S. Brach, M. H. Mickle, "Assessing interactions among multiple physiological systems during walking outside a laboratory: An Android based gait monitor" *Computer Methods and Programs in Biomedicine*, vol. 122, no. 3, pp.450-461, Dec. 2015. **PA**
41. H. Bleton, E. Sejdić, "A cerebral blood flow evaluation during cognitive tasks following a cervical spinal cord injury: a case study using transcranial Doppler recordings," *Cognitive Neurodynamics*, vol. 9, no. 6, pp. 615-626, Dec. 2015. **SRA**
42. S. S. Al-Zaiti, C. Martin-Gill, E. Sejdić, M. Al-Rawashdeh, C. Callaway, "Rationale, development, and implementation of the electrocardiographic methods for the prehospital identification of non-ST elevation myocardial infarction events (EMPIRE)," *Journal of Electrocardiology*, vol. 48, no. 6, pp. 921-926, November-December 2015. **CA**
43. J. M. Dudik, I. Jestrović, B. Luan, J. L. Coyle, E. Sejdić, "Characteristics of dry chin-tuck swallowing vibrations and sounds," *IEEE Transactions on Biomedical Engineering*, vol. 62, no. 10, pp. 2456-2464, October 2015. **SRA**
44. I. Jestrović, J. L. Coyle, E. Sejdić, "Decoding human swallowing via electroencephalography: a state-of-the-art review," *Journal of Neural Engineering*, vol. 12, no. 5, pp. 051001-1-15, October 2015. **SRA**
45. A. Gatouillat, H. Bleton, J. VanSwearingen, S. Perera, S. Thompson, T. Smith, E. Sejdić, "Cognitive tasks during walking affect cerebral blood flow signal features in middle cerebral arteries and their correlation to gait characteristics," *Behavioral and Brain Functions*, vol. 11, pp. 29-1-11, September 2015. **SRA**
46. L. Mats, M. H. Mickle, Z. Zhou, J. R. Stachel, K. Bocan, N. G. Franconi, M. R. Rothfuss, L. Berger, T. Butler, C. Ubinger, S. Lauer, V. Sai, E. Sejdić, "A paradigm shift in passive RFID tag development and manufacturing flexibility to provide active tag functionality," *Journal of Low Power Electronics*, vol. 11, no. 3, pp. 323-332, September 2015. **CA**
47. J. M. Dudik, J. L. Coyle, E. Sejdić, "Dysphagia screening: Contributions of cervical auscultation signals and modern signal processing techniques," *IEEE Transactions on Human-Machine Systems*, vol. 45, no. 4, pp. 465-477, August 2015. **SRA**
48. I. Jestrović, J. L. Coyle, E. Sejdić, "Characterizing functional connectivity patterns during saliva swallows in different head positions," *Journal of NeuroEngineering and Rehabilitation*, vol. 12, pp. 61-1-11, July 2015. **SRA**
49. N. Seth, F. Masood, J. B. Sledge, W. A. Graham, D. L. Rosene, S. Westmoreland, S. Macri, E. Sejdić, A. Hoggatt, H. Simmons, H. A. Abdullah, S. Nesathurai, "Humane non-human primate model of traumatic spinal cord injury: Quantitative analysis of electromyographic data," *Open Journal of Veterinary Medicine*, vol. 5, no. 7, pp. 161-168, July 2015. **CA**
50. J. V. Unadkat, M. A. Rothfuss, M. H. Mickle, E. Sejdić and M. L. Gimbel, "The development of a wireless implantable blood flow monitor," *Plastic and Reconstructive Surgery*, vol. 136, no. 1, pp. 199-203, July 2015. **CA**

51. A. Millecamps, K. A. Lowry, J. S. Brach, S. Perera, M. S. Redfern, E. Sejdić, "Understanding the effects of pre-processing on extracted signal features from gait accelerometry signals," *Computers in Biology and Medicine*, vol. 62, pp. 164-174, July 2015. **SRA**
52. R. C. Thurston, P. M. Maki, C. A. Derby, E. Sejdić, H. J. Aizenstein, "Menopausal hot flashes and the default mode network," *Fertility and Sterility*, vol. 103, no. 6, pp. 1572–1578.e1, June 2015. **CA**
53. J. M. Dudik, A. Kurosu, J. L. Coyle, E. Sejdić, "A comparative analysis of DBSCAN, k-means, and quadratic variation algorithms for automatic identification of swallowing from swallowing accelerometry signals," *Computers in Biology and Medicine*, vol. 59, pp. 10-18, Apr. 2015. **SRA**
54. E. Sejdić, "Gear students up for big medical data," *Nature*, vol. 518, no. 7540, pp. 483, Feb. 2015. **PA**
55. J. M. Dudik, I. Jestrović, B. Luan, J. L. Coyle, E. Sejdić, "A comparative analysis of swallowing accelerometry and sounds during saliva swallows," *Biomedical Engineering Online*, vol. 14, pp. 3-1-15, Jan. 2015. **SRA**
56. N. G. Franconi, A. Bunger, E. Sejdić, M. H. Mickle, "Wireless communications in oil and gas wells," *Energy Technology*, vol. 2, no. 12, pp. 996-1005, Dec. 2014. **CA**
57. A. Sethi, C. Callaway, E. Sejdić, L. Terhorst and E. Skidmore, "Heart rate variability is associated with upper extremity recovery after stroke," *Neurorehabilitation and Neural Repair*, vol. 28, no. 9, pp. 927, Nov./Dec. 2014. **CA**
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30. E. Sejdić, I. Djurović, J. Jiang, "S-transform with frequency dependent Kaiser window," in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2007)*, vol. 3, Honolulu, Hawaii, USA, April 15-20, 2007, pp. 1165-1168. **PA**
31. P. Raković, E. Sejdić, Lj. Stanković, J. Jiang, "Time-frequency signal processing approaches with applications to heart sound analysis," in *Proc. of 33rd Computers in Cardiology Conference*, Valencia, Spain, Sep. 17-20, 2006, pp. 197-200. **CPA**
32. E. Sejdić, J. Jiang, "Comparative study of three time-frequency representations with applications to a novel correlation method," in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2004)*, vol. 2, Montreal, Canada, May 17-21, 2004, pp. 633-636. **PA**
33. E. Sejdić, J. Jiang, "Time-frequency analysis of the heart sounds," in *Proc. of 2002 ECEGRS*, London, Ontario, Canada, May 15-17, 2002, pp. 5-9. **PA**

#### **REFEREED CONFERENCE ABSTRACTS (trainees underlined)**

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1. A. Kurosu, J. M. Dudik, E. Sejdić, J. L. Coyle, "Physiological source of high resolution cervical auscultation signals during swallowing," *2016 Annual American Speech-Language-Hearing Association Convention (ASHA 2016)*, Philadelphia, Pennsylvania, USA, November 17-19, 2016.
2. S. Pomfret, E. Sejdić, J. L. Coyle "Characteristics of oropharyngeal swallowing following single lung transplantation in adults," *2015 Annual American Speech-Language-Hearing Association Convention (ASHA 2015)*, Denver, Colorado, USA, November 12-14, 2015.
3. E. Sejdić, "Time-frequency analysis as an analysis tool for brain networks," *The 2015 International Congress on Industrial and Applied Mathematics (ICIAM 2015)*, Beijing, China, August 10-14, 2015.
4. E. Sejdić, "An overview of the Stockwell transform: theory and applications," *The 2015 International Society for Analysis, its Applications and Computation Congress (ISAAC 2015)*, Macau, China, August 3-8, 2015.
5. I. Jestrović, J. L. Coyle, E. Sejdić, "Functional connectivity patterns associated with swallowing of fluids with various viscosity," *2015 IUPESM World Congress on Medical Physics and Biomedical Engineering (WC2015)*, Toronto, Ontario, Canada, June 7-12, 2015. **SRA**
6. I. Jestrović, J. L. Coyle, E. Sejdić, "Differences in functional connectivity patterns between swallowing in neutral and chin-tuck position," *The 23rd Annual Dysphagia Research Society Meeting*, Chicago, Illinois, USA, March 11-14, 2015. **SRA**

7. E. Sejdić, "Brain-machine interfaces based on transcranial Doppler sonography," *The 6<sup>th</sup> International IEEE EMBS Neural Engineering Conference*, San Diego, CA, USA, November 6-8, 2013. **PA**
8. D. Kalika, N. Czarnek, E. Sejdić, "Baseline characteristics of cerebral blood flow in the middle cerebral arteries measured via transcranial Doppler ultrasound," *2012 BMES Annual Meeting*, Atlanta, GA, USA, October 24-27, 2012. **SRA**
9. P. Sörös, E. Sejdić, "A fast and reliable paradigm for swallowing-related functional MRI," *28<sup>th</sup> Southern Biomedical Engineering Conference*, Houston, Texas, USA, May 4-6, 2012. **SRA**
10. N. Czarnek, D. Kalika, E. Sejdić, "Functional transcranial Doppler as a brain-to-computer interface," *28<sup>th</sup> Southern Biomedical Engineering Conference*, Houston, Texas, USA, May 4-6, 2012. **SRA**
11. B. Manor, H. Valkeinane, E. Sejdić, V. Novak, "The relationship between walking speed and brain volume in type 2 diabetes mellitus," *71<sup>st</sup> Scientific Sessions of American Diabetes Association*, San Diego, California, USA, June 24-28, 2011. **CA**
12. C. M. Steele, T. Chau, E. Sejdić, "Dual-axis cervical accelerometry for aspiration and dysphagia identification," *The Nineteenth Annual Dysphagia Research Society Meeting*, San Antonio, Texas, USA, March 3-5, 2011. **CPA**
13. D. Hung, E. Sejdić, T. Chau, C. M. Steele, "A study of average neck flexion angle during various swallowing tasks," *The 2009 Dysphagia Research Society Annual Meeting*, New Orleans, Louisiana, USA, March 5-7, 2009. **CPA**
14. E. Sejdić, P. Raković, L.J. Stanković, "Analysis and diagnosis of heart diseases using time-frequency analysis," *The 2nd congress of scientist from Bosnia and Herzegovina and abroad*, Sarajevo, Bosnia and Herzegovina, August 27-September 1st, 2008. **PA**

## INVITED LECTURES

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### Keynote Lectures

1. "(Relatively) big data to understand functional changes in swallowing, gait and handwriting" Keynote speaker at *the 6th Mediterranean Conference on Embedded Computing (MECO 2017)*, Bar, Montenegro, June 11-15, 2017.
2. "(Relatively) big data to understand functional changes in swallowing, gait and handwriting" Keynote speaker at *the International Conference on Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBIH 2017)*, Sarajevo, Bosnia and Herzegovina, Mar. 16-18, 2017.

### Podium Presentations (presenters italicized and underlined)

1. Y. Khalifa, Z. Zhang, E. Sejdić, "Sparse recovery of time-frequency representations via recurrent neural networks," in *Proc. of 22nd International Conference on Digital Signal Processing (DSP 2017)*, London, United Kingdom, Aug. 23-25, 2017.
2. A. Khalaf, M. Sybeldon, E. Sejdić, M. Akcakaya, "An EEG and fTCD based BCI for control," in *Proc. of the 50<sup>th</sup> Asilomar Conference on Signals, Systems, and Computers (ASILOMAR 2016)*, Pacific Grove, California, USA, Nov 6-9, 2016.
3. E. Sejdić, F. Movahedi, Z. Zhang, A. Kurosu, J. L. Coyle, "The effects of compressive sensing on extracted features from tri-axial swallowing accelerometry signals," in *Proc. of SPIE – Compressive Sensing V: From Diverse Modalities to Big Data Analytics*, vol. 9857, Baltimore, MD, USA, Apr 20-21, 2016.

4. E. Sejdić, "Time-frequency analysis as an analysis tool for brain networks," *The 2015 International Congress on Industrial and Applied Mathematics (ICIAM 2015)*, Beijing, China, August 10-14, 2015.
5. E. Sejdić, "An overview of the Stockwell transform: theory and applications," *The 2015 International Society for Analysis, its Applications and Computation Congress (ISAAC 2015)*, Macau, China, August 3-8, 2015.
6. I. Jestrović, J. L. Coyle, E. Sejdić, "Functional connectivity patterns associated with swallowing of fluids with various viscosity," *2015 IUPESM World Congress on Medical Physics and Biomedical Engineering (WC2015)*, Toronto, Ontario, Canada, June 7-12, 2015.
7. I. Djurović, E. Sejdić, N. Bulatović, M. Simeunović, "An analysis of spectral transformation techniques on graphs," *SPIE – Compressive Sensing IV*, Baltimore, MD, USA, Apr. 22-24, 2015.
8. E. Sejdić, J. M. Dudik, A. Kurosu, I. Jestrović, J. L. Coyle, "Understanding differences between healthy swallows and penetration-aspiration swallows via compressive sensing of tri-axial swallowing accelerometry signals," *SPIE – Compressive Sensing III*, vol. 9109, Baltimore, MD, USA, May 7-9, 2014.
9. A. Can-Cimino, L. F. Chaparro, E. Sejdić, "Asynchronous signal dependent non-uniform sampler" in *SPIE – Compressive Sensing III*, vol. 9109, Baltimore, MD, USA, May 7-9, 2014.
10. E. Sejdić, L.F. Chaparro, "Time-frequency representations based on compressive samples" in *21st European Signal Processing Conference (EUSIPCO'13)*, Marrakech, Morocco, September 9-13, 2013.
11. X. Liu, J. R. Stachel, E. Sejdić, M. H. Mickle, and J. L. Berger, "The UHF Gen 2 RFID system for transcutaneous operation for orthopedic implants," in *2013 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2013)*, Minneapolis, MN, USA, May 6-9, 2013.
12. I. Orović, A. Draganić, S. Stanković, E. Sejdić, "A unified approach for the estimation of instantaneous frequency and its derivatives for non-stationary signal analysis," *11th International Conference on Information Science, Signal Processing and their Applications (ISSPA 2012)*, Montreal, QC, Canada, July 2-5, 2012.
13. N. Czarnek, D. Kalika, E. Sejdić, "Functional transcranial Doppler as a brain-to-computer interface," *28th Southern Biomedical Engineering Conference*, Houston, Texas, USA, May 4-6, 2012.
14. E. Sejdić, U. Ozertem, I. Djurović, D. Erdogmus, "A new approach for the reassignment of time-frequency representations," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2009)*, Taipei, Taiwan, April 19-24, 2009.
15. S. Primak, E. Sejdić, "Application of multitaper analysis to wireless communications problems," *First International Symposium on Applied Sciences in Biosciences and Communications Technologies (ISABEL '08)*, Aalborg, Denmark, Oct. 25-28, 2008.
16. E. Sejdić, P. Raković, L.J. Stanković, "Analysis and diagnosis of heart diseases using time-frequency analysis," *The 2nd congress of scientist from Bosnia and Herzegovina and abroad*, Sarajevo, Bosnia and Herzegovina, August 27-September 1st, 2008.

#### Poster Presentations (presenters italicized and underlined)

1. M. Daković, L.J. Stanković, B. Lutovac, E. Sejdić, T. B. Šekara, "A resistive circuits analysis using graph spectral decomposition," in *Proc. of the 6th Mediterranean Conference on Embedded Computing (MECO 2017)*, Bar, Montenegro, June 11-15, 2017.
2. M. Sybeldon, L. Schmit, E. Sejdić, M. Akcakaya, "Transfer learning for EEG based BCI using Learn++.NSE and mutual information," in *Proc. of the 2017 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2017)*, New Orleans, Louisiana, USA, Mar 5-9, 2017.

3. A. Kurosu, J. M. Dudik, E. Sejdić, J. L. Coyle, "Physiological source of high resolution cervical auscultation signals during swallowing," *2016 Annual American Speech-Language-Hearing Association Convention (ASHA 2016)*, Philadelphia, Pennsylvania, USA, November 17-19, 2016.
4. I. Jestrović, J. L. Coyle, E. Sejdić, "Differences in functional connectivity patterns between swallowing in neutral and chin-tuck position," *The 23rd Annual Dysphagia Research Society Meeting*, Chicago, Illinois, USA, March 11-14, 2015.
5. E. Sejdić, L.F. Chaparro, "A compressive sampling approach for brain-machine interfaces based on transcranial Doppler sonography: A case study of resting-state maximal cerebral blood velocity signals" *1st IEEE Global Conference on Signal and Information Processing (GlobalSIP 2013)*, Austin, Texas, USA, December 3-5, 2013.
6. E. Sejdić, "Brain-machine interfaces based on transcranial Doppler sonography," *The 6<sup>th</sup> International IEE EMBS Neural Engineering Conference*, San Diego, CA, USA, November 6-8, 2013.
7. J. R. Stachel, E. Sejdić, A. Ogirala, and M. H. Mickle, "The impact of the internet of things on implanted medical devices including pacemakers, and ICDs," *2013 IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2013)*, Minneapolis, MN, USA, May 6-9, 2013.
8. E. Sejdić, "Computational and instrumental gait assessments," *2013 Annual Meeting of Claude D. Pepper Older Americans Independence Centers*, Bethesda, MD, USA, April 8-9, 2013.
9. P. Sörös, E. Sejdić, "A fast and reliable paradigm for swallowing-related functional MRI," *28<sup>th</sup> Southern Biomedical Engineering Conference*, Houston, Texas, USA, May 4-6, 2012.
10. E. Sejdić, L. F. Chaparro, "Recovering heart sounds from sparse samples," *38<sup>th</sup> Annual Northeast Bioengineering Conference*, Philadelphia, PA, USA, March 16-18, 2012.
11. A. Can, E. Sejdić, L. F. Chaparro, "An asynchronous scale decomposition for biomedical signals," *IEEE Signal Processing in Medicine and Biology Symposium (SPBM11)*, New York, USA, Dec. 10<sup>th</sup>, 2011.
12. A. S. Love, E. Sejdić, M. Markowski, M. Waxer, J. B. Morton, R. Sobot, "A brain-controlled 3D sonar scanner," *21st IEEE Canadian Conference on Electrical and Computer Engineering (IEEE CCECE 2008)*, Niagara Falls, Ontario, Canada, May 4-7, 2008.
13. E. Sejdić, M. Luccini, S. Primak, K. Baddour, T. Willink, "Channel estimation using modulated discrete prolate spheroidal sequences based frames," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2008)*, Las Vegas, Nevada, USA, March 31-April 04, 2008.
14. E. Sejdić, P. Raković, M. Daković, L.J. Stanković, "An algorithm for decomposition of heart sounds based on S-method," *2007 European Signal Processing Conference (EUSIPCO 2007)*, Poznan, Poland, Sep. 3-7, 2007.
15. E. Sejdić, I. Djurović, J. Jiang, "S-transform with frequency dependent Kaiser window," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2007)*, vol. 3, Honolulu, Hawaii, USA, April 15-20, 2007.
16. P. Raković, E. Sejdić, L.J. Stanković, J. Jiang, "Time-frequency signal processing approaches with applications to heart sound analysis," *33rd Computers in Cardiology Conference*, Valencia, Spain, Sep. 17-20, 2006.
17. A. G. Rehorn, E. Sejdić, Y. Jiang, J. Jiang, P. Orban, "Advanced modeling, diagnosis and control of manufacturing equipment," *2005 AUTO21 HQP Conference*, Oshawa, Ontario, Canada, May 10-12, 2005.

18. *E. Sejdić, J. Jiang, "Comparative study of three time-frequency representations with applications to a novel correlation method," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2004), vol. 2, Montreal, Canada, May 17-21, 2004.*

### Invited Presentations and Lectures

1. "Engineering human gait" *St. Joseph's Parkwood Institute, Oct. 17, 2017.*
2. "Engineering human functions: Novel data analytics and instrumentation to understand and alter swallowing and gait" *University of Western Ontario, Oct. 17, 2017.*
3. "Engineering human functions: Novel data analytics and instrumentation to understand and alter swallowing and gait" *University of Tuzla, Aug. 31, 2017.*
4. "Medical Internet of Things and Big Data in Healthcare" *Institut National des Sciences Appliquées de Lyon, June 27, 2017.*
5. "(Relatively) big data to understand functional changes in swallowing, gait and handwriting" *Montenegrin Academy of Sciences and Arts, March 23, 2017.*
6. "(Relatively) big data to understand functional changes in swallowing, gait and handwriting" *Temple University, November 17, 2016.*
7. "Introduction to big data and recent advances to understand changes in swallowing, gait and handwriting functions" *University of Pittsburgh, April 5, 2016.*
8. "From big data to functional outcomes: Can we use large data sets to understand changes in swallowing, gait and cerebral functions?" *University of Buffalo, March 4, 2016.*
9. "From big data to functional outcomes: Can we use large data sets to understand changes in swallowing, gait and cerebral functions?" *University of Waterloo, February 19, 2016.*
10. "(Big) Data analytics in gait research" *University of Pittsburgh, February 15, 2016.*
11. "From big data to functional outcomes: Can we use large data sets to understand changes in swallowing, gait and cerebral functions?" *University of Western Ontario, January 22, 2016.*
12. "From big data to functional outcomes: Can we use large data sets to understand changes in swallowing, gait and cerebral functions?" *University of Michigan, January 7, 2016.*
13. "From big data to functional outcomes: Can we use large data sets to understand changes in swallowing, gait and cerebral functions?" *IEEE SPS & EMBS Atlanta, Georgia Tech, November 20, 2015.*
14. "A signal processing approach to biomarkers: Dynamical biomarkers and recent advances in swallowing, gait, handwriting and preference detection research," *University of Pittsburgh, November 15, 2013.*
15. "Real-time monitoring of bridge pier scouring during flood events" *2013 Transportation Forum, University of Pittsburgh, March 27<sup>th</sup>, 2013.*
16. "Introduction to time-frequency analysis and its biomedical applications," *Workshop on Microlocal Methods in Medical Imaging, Fields Institute, August 15<sup>th</sup>, 2012.*
17. "A preliminary study of brain networks associated with swallowing," *Center for Bioimage Informatics, Carnegie Mellon University, April 11<sup>th</sup>, 2012.*
18. "A signal processing approach to biomarkers: Dynamical biomarkers and recent advances in swallowing, gait, handwriting and preference detection research," *University of Delaware, January 18<sup>th</sup>, 2011.*
19. "Introduction to rehabilitation engineering and an overview of recent advances in swallowing, gait, handwriting and preference detection research," *Simon Fraser University, June 1<sup>st</sup>, 2010.*

20. "A tale of biomedical engineering efforts: An overview of recent advances to understand swallowing, gait, handwriting and preference detection," *Harvard University*, May 5<sup>th</sup>, 2010.
21. "An overview of rehabilitation engineering and recent advances," *University of Western Ontario*, February 12<sup>th</sup>, 2010.
22. "Innovative medical and electronic devices" *Ryerson University*, January 21<sup>st</sup>, 2010.
23. "Rehabilitation engineering," *University of Montenegro*, October 20<sup>th</sup>, 2009.
24. "The Aspirometer: A Progress Report," *Bloorview Kids Rehab*, Toronto, Ontario, Canada, Bloorview Seminar Series, Sept. 8, 2009.
25. "Dual-axis cervical auscultation: An overview of recent advances," *Toronto Rehabilitation Institute*, Toronto, Ontario, Canada, The Upper Airway Club Meeting, April 27, 2009.

## RESEARCH CONTRIBUTIONS

### RESEARCH GRANTS AND CONTRACTS

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#### Peer reviewed (Current)

1. The Aspirometer: A noninvasive tool to detect swallowing safety and efficiency (Renewal). **Principal Investigator**. National Institutes of Health (About \$1.7 million; 2018-2023).
2. Phase I IUCRC University of Pittsburgh: Center for Space, High-performance, and Resilient Computing (SHREC). **Co-Principal Investigator** (PI: Alan George, Co-PIs: Ervin Sejdic, Alex Jones, Jun Yang). National Science Foundation (\$450,000; 2017-2022).
3. Instrumental screening for dysphagia by combining high-resolution cervical auscultation with advanced data analysis tools to identify silent dysphagia and silent aspiration. **Principal Investigator**. National Institutes of Health (\$1,211,286; 2017-2021).
4. Gait as a clinical marker to predict progression to dementia syndromes in MCI. **Co-Investigator** (PI: Manuel Montero-Odasso). Canadian Institutes of Health Research (\$967,725; 2017-2022).
5. CAREER: Advanced data analytics and high-resolution cervical auscultation can accurately predict dysphagia. **Principal Investigator**. National Science Foundation (\$549,139; 2017-2022).
6. Adapting a new contrast sensitivity visual screening into PennDOT's driver qualifications program. **Principal Investigator**. Pennsylvania Department of Transportation (\$176,012; 2016-2018)
7. Presidential Early Career Awards for Scientists and Engineers (an extension of The Aspirometer: A noninvasive tool to detect swallowing safety and efficiency). **Principal Investigator**. National Institutes of Health (\$306,102; 2016-2018).
8. Pittsburgh older Americans independence center. **Co-investigator**. (PI: Susan Greenspan). National Institutes of Health (\$930,406, My share is about \$26,000, 2015-2020)
9. The Aspirometer: A noninvasive tool to detect swallowing safety and efficiency. **Principal Investigator**. National Institutes of Health (\$998,597; 2013-2018).

#### Peer reviewed (Completed)

1. I-HITS: Individualized hand improvement and tracking system for stroke. **Co-Investigator** (PI: Amit Sethi, Co-I: Ervin Sejdić). The University of Pittsburgh Center for Medical Innovation (\$22,000; 2016-2017).
2. Stratifying Prehospital ECGs of Acute Coronary Syndrome Patients to Expedite Stratifying Prehospital ECGs of Acute Coronary Syndrome Patients to Expedite Treatment Decision Making in Emergency Departments (SPEED). **Co-Investigator** (PI: Salah Al-Zaiti, Co-I: Ervin Sejdić). National Center for Advancing Translational Sciences (\$25,000, 2017).
3. Measuring the effect of grid voltage on building energy loads. **Co-Principal Investigator**. (PI: Thomas McDermott, CO-PI: Ervin Sejdić and Murat Akcakaya). The Mascaro Center for Sustainable Innovation at the University of Pittsburgh (\$50,000; 2015-2016).
4. Remote Sensing for Bridge Scour Projects - Phase 3. **Principal Investigator**. Pennsylvania Department of Transportation (\$86,117; 2015-2016)
5. Clinical and Translational Science Institute. **Co-Investigator**. National Institutes of Health (My share: \$44,548; 2014-2015)



6. Stratifying Prehospital ECGs of Ischemic Coronary Events at Emergency Departments (SPEED). Co-Investigator (PI: Salah Al-Zaiti, Co-I: Clifton Callaway, Ervin Sejdić and Amro El-Jaroudi). The University of Pittsburgh Center for Medical Innovation (\$12,000; 2014-2015).
7. I-HITS: Individualized hand improvement and tracking system for stroke. Co-Investigator (PI: Amit Sethi, Co-I: Ervin Sejdić and Scott Bleakely). The University of Pittsburgh Center for Medical Innovation (\$18,000; 2015-2016).
8. Collaborative Academic Rehabilitation Engineering (CARE). Collaborator. (Principal Investigator: T. Chau. Co-Applicants: R. Baecker, J. P. Santerre, H. E. Naguib, A Colantonio, G. R. Fernie, W Wong, C Steele, B. E. Maki, M. R. Popovic, A. Mihailidis.) Natural Sciences and Engineering Research Council, Collaborative Research and Training Experience (CREATE) Program (\$1,650,000, 2009-2015). Grant No: 370871-2009.
9. A comparative study of swallowing sounds and vibrations. Principal Investigator. The Central Research Development Fund at the University of Pittsburgh (\$16,000; 2012-2014).
10. Wireless implantable blood flow monitoring device for free flap surgeries and peripheral vascular stens. Co-Principal Investigator (with Michael L. Gimbel, Marlin H. Mickle, Michael A. Rothfuss). The University of Pittsburgh Center for Medical Innovation (\$15,000; 2013-2014).
11. Biometric Authentication using Handwriting Biomechanics. Co-Principal Investigator (with T. Chau, E. Anagnostou and Syngrafii Corporation): NSERC Collaborative Research and Development Program. (\$340,000; 2010-2013). Grant No: CRDPJ 391549-09.
12. A passive pH sensor for general application. Co-Principal Investigator (with Marlin H. Mickle). University Innovation Grant (\$12,000; 2013).
13. Phase 2 – Remote sensing for bridge scour project. Principal Investigator. Pennsylvania Department of Transportation (\$160,000; 2013).
14. iGait – A smart and low-cost device for monitoring human gait. Principal Investigator. The Claude D. Pepper Older Americans Independence Center at University of Pittsburgh (\$10,000; 2012).

### Industrial support (Current)

1. General work order #3. **Principal Investigator.** GS1, (\$40,000; 2018)

### Industrial support (Completed)

1. General work order #2. **Principal Investigator.** GS1, (\$40,000; 2017-2018)
2. General work order. **Principal Investigator.** GS1, (\$40,000; 2016-2017)
3. Report GUI updates for new high speed point-of-sale report template. **Principal Investigator.** GS1, (\$2,375; 2016)
4. High speed point-of-sale sentinel testing. **Principal Investigator.** GS1, (\$2,375; 2016)
5. POS handheld/presentation setup. **Principal Investigator.** GS1, (\$14,250; 2016)
6. Internet 2 - Internet of Things University Electric Vehicle Project. **Principal Investigator.** Innova UEV, (\$5,000; 2015-2016).
7. Contactless credit card skimming mall demonstration project. **Principal Investigator.** Rogue Industries, (\$19,360; 2015).
8. Report GUI updates and new report generation. **Principal Investigator.** GS1, (\$4,750; 2015)

9. Analysis code update and new report generation. **Principal Investigator.** GS1, (\$6,840; 2015)
10. Point-of-Sale scanner testing. **Principal Investigator.** GS1, (\$16,625; 2015)
11. Point-of-Sale scanner testing setup. **Principal Investigator.** GS1, (\$15,972; 2015)
12. Wheel painting. **Principal Investigator.** GS1, (\$595; 2014-2015).
13. Installation of protective fence. **Principal Investigator.** GS1, (\$2,250; 2014-2015).
14. General Distribution Test. **Principal Investigator.** GS1, (\$20,710; 2014-2015).
15. Long Range Scanning Test. **Principal Investigator.** GS1, (\$18,150; 2014).
16. Plan for Equipment Functionality. **Principal Investigator.** GS1, (\$77,145; 2014).
17. Travelon RFID testing. **Principal Investigator.** Travelon Inc., (\$1,400; 2013).
18. Credit card demonstration. **Principal Investigator.** Rogue Industries, (\$5,000; 2013).
19. Ortho-Tag Development and Sensor Electronics for pH - Phase II. **Co-Principal Investigator** (with Marlin H. Mickle). Ortho-Tag, Inc. (\$99,860; 2012-2013)

### Non-peer reviewed (Completed)

1. Brain Gain Program (BGP+ Classic). **Principal Investigator.** World University Services Austria. (1800 euros, 2010)
2. Brain Gain Program (BGP+ Classic). **Principal Investigator.** World University Services Austria. (2300 euros, 2009)

## PATENTS

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### Patents filled

1. E. Sejdić, J. M. Dudik, J. L. Coyle, A. El-Jaroudi, Z.-H. Mao, M. Sun, "Deep learning for classification of normal swallows in adults," US Patent 62/375,964, August 17, 2016.
2. M. A. Rothfuss, E. Sejdić, M. L. Gimbel, "A touch probe passively powered wireless stent antenna for implanted sensor powering and interrogation," US Patent 62/336,897, filed on May 16, 2016.
3. S. Al-Zaiti, E. Sejdić, C. W. Callaway, "Electrocardiographic methods," US Patent 62/146,775, filed on April 13, 2015.
4. M. H. Mickle, Z. Zhou, K. Bocan, J. R. Stachel, V. Sai, A. Ogirala, N. G. Franconi, E. Sejdić "Passively powered image capture and transmission system," U.S. Patent 62/053,939, filed on September 23, 2014.
5. M. H. Mickle, J. R. Stachel, K. Bocan, E. Sejdić "Powering and reading implanted devices," U. S. Patent 61/823598, filed on May 15, 2013.
6. C. M. Steele, T. Chau, E. Sejdić "Method and device for aspiration detection," U. S. Patent 61/433750, filed on January 18th, 2011.
7. M. Modir Shanechi, T. Chau, E. Sejdić, "Handwriting authentication method, system and computer program," U. S. Patent 61/167024, filed on April 6th, 2009.
8. E. Sejdić, T. Chau, "Method and system of segmentation and the time duration analysis of dual-axis swallowing accelerometry signals," U. S. Patent 61/109223, filed on October 29th, 2008.

**Patents granted**

1. T. Chau, C. M. Steele, E. Sejdić, B. Maruzzo, "Method and device for swallowing impairment detection" China Patent 201280013867.X, November 9, 2016.
2. E. Sejdić, T. Chau, "A procedure for denoising dual-axis swallowing accelerometry," U. S. Patent 8,992,446, March 31, 2015.

**RESEARCH INTERESTS**

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- Advanced information systems in medicine
- Anticipatory medical devices
- Rehabilitation engineering
- Assistive technologies
- Robot-mediated rehabilitation
- Biomedical signal processing
- Swallowing difficulties
- Gait analysis
- Vascular aging and diseases

**PARTNERSHIPS**

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**Industrial Partnerships****Company**

GS1

**Research Area**

Barcodes

Panacis Medical Inc. (Ottawa, Ontario, Canada)



Swallowing difficulties

Syngrafii (Toronto, Ontario, Canada)



Handwriting biometrics

**Clinical Partnerships****Institution**

University of Pittsburgh Medical Center (Pittsburgh, PA, USA)

**Research Area**

Human gait and swallowing difficulties

Toronto Rehabilitation Institute (Toronto, Ontario, Canada)



Swallowing difficulties

Holland Bloorview Kids Rehabilitation Hospital (Toronto, Ontario, Canada)



Swallowing difficulties

## TEACHING AND SUPERVISION

### TEACHING EXPERIENCE

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#### Undergraduate teaching

- 2011- Present **Instructor**, Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- ECE 1563 – Signal Processing Laboratory  
Teaching effectiveness: 4.59/5 (Fall 2011), 4/5 (Spring 2012), 4.39/5 (Spring 2013), 4.73/5 (Fall 2013), 4.19/5 (Spring 2016), 4.11/5 (Spring 2017)
  - ECE 1552 - Signals and Systems  
Teaching effectiveness: 4.08/5 (Spring 2014), 4.33/5 (Fall 2015), 4.08/5 (Fall 2016)
- 2009 **Guest Lecturer**, Department of Electrical and Computer Engineering, Ryerson University, Toronto, Ontario, Canada
- BME 100 – Introduction to Biomedical Engineering
- 2008 **Guest Lecturer**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- ECE 330b – Control Systems
- 2007 **Lecturer**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- ECE 208a – Electrical Measurements and Instrumentation  
Teaching effectiveness: 6/7 (Fall 2007)
- 2002 – 2007 **Teaching Assistant**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- ECE 331a – Digital Signal Processing (2002-2006)
  - ECE 241b – Electrical Laboratory II (2004-2007)
  - ECE 469b – Digital Control (2003)

#### Graduate Teaching

- 2011 – Present **Instructor**, Department of Electrical and Computer Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- ECE 2555 – Biomedical Signal Processing  
Teaching effectiveness: 3.88/5 (Spring 2017)
  - ECE 2595 – Introduction to Advanced Signal Processing Approaches in Biomedicine  
Teaching effectiveness: 4.27/5 (Fall 2012), 3.67/5 (Fall 2014), 4.33/5 (Fall 2015)
  - ECE 3893 – Graduate Seminar
- 2015 – Present **Instructor**, Department of Biomedical Informatics, School of Medicine, University of Pittsburgh, Pittsburgh, PA, USA
- BIOINF 2032 – Biomedical Informatics Journal Club  
Teaching effectiveness: 4.5/5 (Spring 2015)
- 2013 – Present **Guest Lecturer**, Swanson School of Engineering, University of Pittsburgh, Pittsburgh, PA, USA
- ENGR 3000 – Preparation for an Academic Career

- 2011 **Guest Lecturer**, Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, USA
- EECE 7310 – Modern Signal Processing
- 2008 **Guest Lecturer**, Institute of Biomaterials and Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada
- BME 1450 – Bioengineering Science
- 2008 **Guest Lecturer**, Department of Electrical and Computer Engineering, The University of Western Ontario, London, Ontario, Canada
- ECE 9931 – Modeling and Simulation of MIMO Wireless Channels

## TRAINING OF HIGHLY QUALIFIED PERSONNEL

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### PhD students

- 2017 – Present Shitong Mao, PhD, University of Pittsburgh, Topic: Swallowing and machine learning
- 2017 – Present Pritika Dasgupta, PhD, University of Pittsburgh, Topic: Gait and machine learning
- 2017 – Present Yassin Khalifa, PhD, University of Pittsburgh, Topic: Swallowing and machine learning
- 2016 – Present Soheli Sarwar, PhD, University of Pittsburgh, Topic: Machine learning
- 2016 – Present Zhenwei Zhang, PhD, University of Pittsburgh, Topic: Swallowing and machine learning
- 2012 – Present Nicholas Franconi, PhD, University of Pittsburgh, Topic: Wireless monitoring device (co-supervising with Dr. Andy Bunker)

### PhD students completed

- 2012 – 2017 Michael Rothfuss, PhD, University of Pittsburgh, “Automatic blood vessel patency detection for wireless implantable medical devices”
- 2012 – 2017 Kara Bocan, PhD, University of Pittsburgh, “Analysis of tissue variability and adaptive transcutaneous power”
- 2013 – 2016 Iva Jestrovic, PhD, University of Pittsburgh, “A study of brain networks associated with swallowing via electroencephalography signals”
- 2013 – 2015 Joshua Dudik, PhD, University of Pittsburgh, “Cervical auscultation for the identification of swallowing difficulties”

### Masters students

- 2017 – Present Qifan He, Masters of Science, University of Pittsburgh, Topic: Swallowing and machine learning
- 2017 – Present Justin Hawks, Masters of Science, University of Pittsburgh, Topic: Machine learning

### Masters students completed

- 2016 – 2017 Cedrine Rebrion, Masters of Science, University of Pittsburgh, “Horizontal and vertical displacement of the hyoid bone affect cervical auscultation signal features during swallowing”
- 2015 – 2016 Etienne Zahnd, Masters of Science, University of Pittsburgh, “Prediction methods for  $1/f^{\beta}$  processes with application to the analysis of stride interval time series”

- 2015 – 2016 Zhenwei Zhang, Masters of Science, University of Pittsburgh, “Most suitable mother wavelet for the analysis of fractal properties of stride interval time series via the average wavelet coefficient”
- 2014 – 2015 Antoine Dumortier, Masters of Science, University of Pittsburgh, “Classifying smoking urges via machine learning”
- 2014 – 2015 Arthur Gatouillat, Masters of Science, University of Pittsburgh, “A study of the motor cognitive interaction during walking using transcranial Doppler”
- 2013 – 2015 Othman Muhei-Aldin, Masters of Science, University of Pittsburgh, “A study of brain networks associated with motor sequence learning foot tapping tasks”
- 2013 – 2014 Heloise Bleton, Masters of Science, University of Pittsburgh, “Cognitive function evaluation following a cervical spinal cord injury: a case study through the middle cerebral arteries using transcranial Doppler”
- 2012 – 2013 Alexandre Millecamps, Masters of Science, University of Pittsburgh, “Analysis of the effects of pre-processing and dual-tasking on gait accelerometry signals”
- 2012 – 2013 Alexander Schaefer, Masters of Science, University of Pittsburgh, “An assessment of fractal characterization methods for  $1/f^{\beta}$  processes with application to the analysis of stride interval time series”
- 2012 – 2013 Iva Jestrovic, Masters of Science, University of Pittsburgh, “The effects of head movements and fluids with increasing viscosity on swallowing sounds”
- 2012 – 2013 Joshua Dudik, Masters of Science, University of Pittsburgh, “Age, sex and head position effects on swallowing accelerometry and sounds”
- 2012 – 2013 Hanrui Huang, Masters of Science, University of Pittsburgh, “Characterization of anterior cerebral artery blood flow in resting state by using transcranial Doppler recordings”
- 2012 – 2013 Bo Luan, Masters of Science, University of Pittsburgh, “A graph-theoretic approach to brain networks associated with swallowing”
- 2010 – 2010 Hayley Faulkner, Masters of Applied Science, University of Toronto, Topic: Transcranial Doppler Ultrasound as a novel access modality (co-supervised with Dr. T. Chau)
- 2009 – 2010 Andrew Myrden, Masters of Applied Science, University of Toronto, Topic: Transcranial Doppler Ultrasound as a novel access modality (co-supervised with Dr. T. Chau)
- 2009 – 2010 Céleste Mérey, Masters of Health Science, University of Toronto, “Quantitative classification of swallowing safety through accelerometer measurement device” (co-supervised with Dr. T. Chau)
- 2008 – 2010 Denine Ellis, Masters, University of Toronto, “Investigating the relationship between metabolic energy expenditure and fractal dynamics” (co-supervised with Dr. T. Chau)
- 2008 – 2009 Jillian Fairley, Masters of Applied Science, University of Toronto, “The effect of treadmill walking on the fractal dynamics of pediatric gait” (co-supervised with Dr. T. Chau)
- 2008 – 2009 Matthew Chang, Masters of Applied Science, University of Toronto, “The relationship between dynamic stability and fractal dynamics of gait” (co-supervised with Dr. T. Chau)
- 2008 Fady Hana, Masters of Health Science, University of Toronto, “Anthropometric and demographic correlates of dual-axis swallowing accelerometry” (co-supervised with Dr. T. Chau)

**Graduate internship students**

2012 Lakshmi Ramanathan, ENSEA (Grande école d'ingénieurs généraliste en électronique),  
Project: "Human gait assessment using iPhone"

**Undergraduate independent study**

2012 Meng Li, University of Pittsburgh, "Comparison of signal features based on cerebral blood flow velocities during cognitive tasks and rests"  
2012 Dimitry Kalika, University of Pittsburgh, "Cerebral blood flow velocity in anterior cerebral arteries"  
2012 Bo Luan, University of Pittsburgh, "Brain networks associated with swallowing"  
2012 Scott Thompson, University of Pittsburgh, "Multimodal assessment of swallowing"

**Undergraduate senior design**

2017 Nathan Anuskiewicz, University of Pittsburgh, "Mobile step length measurement using IMUs"  
2017 Jennifer Fang, University of Pittsburgh, "Mobile step length measurement using IMUs"  
2017 Michael Mortensen, University of Pittsburgh, "Mobile step length measurement using IMUs"  
2015 Andrew Wolfe, University of Pittsburgh, "ServBot: Exploring the future of labor automation in the food industry"  
2015 Ziquan Zhou, University of Pittsburgh, "ServBot: Exploring the future of labor automation in the food industry"  
2015 Darren Hall, University of Pittsburgh, "Roadrunner: Human-powered portable charging station for EV"  
2015 Michael Milli, University of Pittsburgh, "Roadrunner: Human-powered portable charging station for EV"  
2014 Mark Bressler, University of Pittsburgh, "TCD splitter"  
2014 James Dwyer, University of Pittsburgh, "TCD splitter"  
2014 Scott Hally, University of Pittsburgh, "TCD splitter"  
2014 James Clampffer, University of Pittsburgh, "Robotic arm controller"  
2014 Robert McCartney, University of Pittsburgh, "Robotic arm controller"  
2014 Mohan Wang, University of Pittsburgh, "Robotic arm controller"  
2014 Amanda Erhard, University of Pittsburgh, "Writing kinematics in healthy young adults"  
2014 Kai Manuel, University of Pittsburgh, "Writing kinematics in healthy young adults"  
2013 Jeffrey Logsdon, University of Pittsburgh, "Writing kinematics in healthy young adults"  
2013 Sovay McGalliard, University of Pittsburgh, "Writing kinematics in healthy young adults"  
2013 Zachary Shelhamer, University of Pittsburgh, "Writing kinematics in healthy young adults"  
2013 Scott Thompson, University of Pittsburgh, "The effects of cognitive tasks on cerebral blood flow velocity during walking"  
2013 Traci Smith, University of Pittsburgh, "The effects of cognitive tasks on cerebral blood flow velocity during walking"  
2013 Meng Li, University of Pittsburgh, "A wearable physiological monitor with real time communication"

- 2013 Zhipeng Liu, University of Pittsburgh, “A wearable physiological monitor with real time communication”
- 2012 Joseph Ates, University of Pittsburgh, “iGait: Low cost medical data acquisition” (co-supervised with Dr. A. K. Jones)
- 2012 Nicholas Czarnek, University of Pittsburgh, “Analysis of brain signals using bilateral transcranial Doppler ultrasound”
- 2012 Krystal Heath, University of Pittsburgh, “iGait: Low cost medical data acquisition” (co-supervised with Dr. A. K. Jones)
- 2012 Dimitry Kalika, University of Pittsburgh, “Analysis of brain signals using bilateral transcranial Doppler ultrasound”

### **Undergraduate thesis supervision**

- 2008 – 2009 Delbert Hung, University of Toronto, “A study of average neck flexion angle and its relation to anthropometric variables”
- 2008 – 2009 Vicki Kumisar, University of Toronto, “An investigation of baseline characteristics of dual-axis swallowing accelerometry signals”

### **Undergraduate internship students**

- 2009 Alanna Vanden Kroonenberg, University of Waterloo, Project: “Effects of listening to music or viewing televisions on human gait”

### **Undergraduate summer research supervision**

- 2017 Jasna Nuhic, 2<sup>nd</sup> year Biomedical Engineering, International Burch University, “Machine learning for cervical auscultation signals”
- 2017 Henry Phalen, 3<sup>rd</sup> year Biomedical Engineering, University of Pittsburgh, “Analysis of neuroimaging data”
- 2015 Breno de Andrade, 4<sup>th</sup> year Electrical Engineering, Federal University of Rio Grande do Norte (UFRN-Brazil), “Gait monitoring using a smartphone”
- 2015 Joao Antonio de Santa Ritta E Rondina, 4<sup>th</sup> year Electrical Engineering, University of Brasilia, “Gait monitoring using a smartphone”
- 2015 Jacques Bourree, 4<sup>th</sup> year Electrical Engineering, École polytechnique universitaire de Montpellier - Polytech Montpellier, “Handwriting assessment”
- 2014 Antoine Charon, 4<sup>th</sup> year Electrical Engineering, École polytechnique de l'université de Nantes - Polytech Nantes, “The application of graph theory to gait assessment”
- 2014 Christian Thomas, 1<sup>st</sup> year engineering student, University of Pittsburgh, “The application of graph theory to gait assessment”
- 2013 John Teoli, 3<sup>rd</sup> year Electrical Engineering, University of Pittsburgh, “Human gait assessment using a smart phone”
- 2012 Kara Bocan, 4<sup>th</sup> year Electrical/Biomedical Engineering, University of Pittsburgh, “Design of continuous audio output for a fingertip pulse oximeter” (co-supervised with Dr. M. Mickle)



- 2012 Annmarie Grant, 1st year Electrical Engineering, University of Pittsburgh, “I can’t get up because I haven’t fallen: iGait as preventative measure” (co-supervised with Dr. A. K. Jones)
- 2012 Meng Li, 3rd year Electrical Engineering, University of Pittsburgh, “Assessment of cerebral blood flow velocities during cognitive tasks and rests”
- 2010 Briar Findlay, 2nd year Kinesiology, Queen’s University, “Understanding the baseline characteristics of pediatric swallowing accelerometry signals”
- 2009 Yingying Fu, 2nd year Electrical Engineering, University of Toronto, “Effects of audio, visual and tactile cues on human gait”
- 2009 Rebecca Jeffery, 2nd year Biological Science, University of Guelph, “Investigation of human gait while listening to music or watching TV”
- 2009 Alison Pak, 2nd year Psychology, University College London (England), “Understanding connections between brain and human gait while exposed to different cues”
- 2009 Duluxan Sritharan, 2nd year Electrical Engineering, University of Toronto, “Fractal analysis of repetitive handwriting tasks in a pediatric population”
- 2008 Delbert Hung, 3rd year Engineering Science, University of Toronto, “Average angle extraction of neck flexion angle from sagittal videos”
- 2008 Vicki Komisar, 3rd year Engineering Science, University of Toronto, “Characterization of noise and disturbances in swallowing signals”

### High school internship students

- 2017 Adam Moritz, “Machine learning of high-resolution cervical auscultation signals”
- 2015 Olaoluwa Owoputi, Plum Senior High School, Pittsburgh, PA, “Classifying EEG swallowing signals by liquid viscosity”

### PhD supervisory and examination committees

- 2017 Joydeep Rakshit, “Efficient security in non-volatile Memories,” Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Kartik Mohanram. PhD proposal exam.
- 2017 Sicheng Li, “Towards efficient hardware acceleration of deep neural networks on FPGA,” Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Helen Li. PhD dissertation final exam.
- 2017 Heather Bansbach, Evaluation of an inertial sensor to quantify postural stability assessments in young healthy individuals and individuals with chronic ankle instability, Department of Bioengineering, University of Pittsburgh. Supervisor: Tim Sell. PhD dissertation final exam
- 2017 Ismail Bayram, FeFET based nonvolatile TCAM and DRAM development, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation final exam
- 2017 Oluwafemi J. Aworo, Resilient microgrids using a state controller, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Alexis Kwasinski, PhD dissertation proposal exam

- 2017 Mona Ramadan, Video analysis by deep learning, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Amro El Jaroudi. PhD dissertation proposal exam
- 2016 Ismail Bayram, FeFET based nonvolatile TCAM and DRAM development, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation proposal exam
- 2016 Enes Eken, Developing spin-hall assisted STT-RAM design and variation aware simulation tool, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation proposal exam
- 2016 Thamer Alharbi, , Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Zhi-Hong Mao. PhD dissertation proposal exam
- 2016 Sicheng Li, A data locality-aware design framework for reconfigurable sparse matrix multiplication kernel, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Helen Li. PhD dissertation proposal exam
- 2016 Yaojun Zhang, A statistical STT-RAM design view and robust designs at scaled technologies, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation final exam
- 2016 Xiang Chen, Smartphone power consumption characterization and dynamic optimization techniques for OLED display, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation final exam
- 2016 Heather Bansbach, Evaluation of an inertial sensor to quantify postural stability assessments in young healthy individuals and individuals with chronic ankle instability, Department of Bioengineering, University of Pittsburgh. Supervisor: Tim Sell. PhD dissertation proposal exam
- 2016 Yuan Hu, Improving coordinated traffic signal timing through connected vehicle technology, Department of Civil and Environmental Engineering, University of Pittsburgh. Supervisor: Mark Magalotti. PhD dissertation final exam
- 2016 Beiye Liu, Neuromorphic system design and application, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation final exam
- 2016 Kent W. Nixon, Invisible shield: Gesture-based mobile authentication, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD preliminary exam
- 2015 Hao Wang, Transfer function based multiple-resonator wireless power transmission system analysis and design, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Mingui Sun. PhD dissertation final exam
- 2015 Brandon M. Hamschin, A sequential method for passive detection, characterization and localization of multiple low probability of intercept LFM CW signals, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Patrick J. Loughlin. PhD dissertation final exam
- 2015 Wujie Wen, Error characterization and correction techniques for reliable spin-transfer torque random access memory design, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation final exam

- 2015 Sicheng Li, FPGA acceleration of recurrent neural network based language model, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD preliminary exam
- 2015 Vikram Thiruneermalai Gomatam, Characterization and classification of objects in non-stationary channels, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Patrick J. Loughlin. PhD dissertation final exam.
- 2014 Yicheng Bai, A wearable indoor navigation system for blind and visually impaired individuals, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Mingui Sun. PhD dissertation final exam.
- 2014 Xiang Chen, Smartphone power consumption characterization and dynamic optimization techniques for OLED display, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation proposal exam.
- 2014 Jiafeng Xie, Novel single and hybrid finite field multipliers over  $GF(2^M)$  for emerging cryptographic systems, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Zhihong Mao. PhD dissertation final exam.
- 2014 Brandon Hamschin, Passive detection, characterization and localization of multiple LFM CW LPI signals, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Patrick Loughlin. PhD dissertation proposal exam.
- 2014 Vikram Thiruneermalai Gomatam, Characterization and classification of objects in non-stationary channels, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Patrick J. Loughlin. PhD dissertation proposal exam.
- 2014 Wujie Wen, Error characterization and correction techniques for reliable spin-transfer torque random access memory designs, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD dissertation proposal exam.
- 2014 Azime Cimino-Can, Asynchronous representation and processing of analog sparse signals using a time-scale framework, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Luis F. Chaparro. PhD dissertation final exam.
- 2014 Shiyong Dong, Time-frequency characterization of heart rate variability signals: applications to the analysis and detection of perinatal asphyxia, School of Medicine, The University of Queensland, Supervisor: Paul Colditz. PhD dissertation final exam.
- 2014 Jiafeng Xie, Novel finite field multipliers over  $GF(2^M)$  for emerging cryptographic systems, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Zhihong Mao. PhD dissertation proposal exam.
- 2013 Haifeng Xu, A self-organizing wireless sensor network and distributed computing engine with commodity palmtop computers, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Alex K. Jones. PhD proposal exam.
- 2013 Hao Wang, Transfer function based multiple-resonator wireless power transmission system analysis and design, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Mingui Sun. PhD proposal exam.
- 2013 Jiafeng Xie, Low latency, low complexity multiplies over  $GF(2^M)$  for modern cryptographic systems, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Zhihong Mao. PhD preliminary exam.

- 2013 Yaojun Zhang, STT-RAM cell design optimization for persistent and non-persistent error rate reduction, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Yiran Chen. PhD preliminary exam.
- 2013 Osama Alkishriwo, The discrete linear chirp transform and its applications, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Luis F. Chaparro. PhD dissertation final exam.
- 2012 Yicheng Bai, A wearable indoor navigation system for the blind and visually impaired individuals, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Mingui Sun. PhD proposal exam.
- 2012 Chengliu Li, Magnetic hand tracking for human-computer interfaces, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Mingui Sun. PhD proposal exam.
- 2012 Ang Li, Control system model for analysis of electricity market bidding process, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisors: Zhihong Mao and Greg Reed. PhD dissertation final exam.
- 2012 Azime Can, Asynchronous continuous-time processing of sparse signals, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Luis F. Chaparro. PhD proposal exam.
- 2012 Ang Li, Control system model for analysis of electricity market bidding process, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisors: Zhihong Mao and Greg Reed. PhD proposal exam.
- 2011 Osama Alkishriwo, The discrete linear chirp transform and its applications, Department of Electrical and Computer Engineering, University of Pittsburgh. Supervisor: Luis F. Chaparro. PhD proposal exam.

### **MS supervisory and examination committees**

- 2018 Sarah A. Pomfret, Comparison of swallowing outcomes in single vs. double lung transplant recipients, Department of Communications Science and Disorders, University of Pittsburgh, Supervisor: James L. Coyle. MS thesis exam.
- 2017 Busra Tugce Susam, Pain assessment with electrodermal activity signals by machine learning applications, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Murat Akacakaya. MS thesis exam
- 2016 Matt Sybeldon, Addressing nonstationarity in EEG applications, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Murat Akacakaya. MS thesis exam.
- 2016 Malia Kelsey, Applications of sparse recovery and dictionary learning analysis towards the analysis of electrodermal activity, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Murat Akacakaya. MS thesis exam.
- 2015 Brian B. Doll, Optimization of neuromuscular electrical stimulation to reduce muscle fatigue during isometric contractions, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Nitin Sharm. MS thesis exam.

- 2014 Sinan Yigit, Optimal controller design for more-electric aircraft power systems, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisors: Zhihong Mao and Greg Reed. MS thesis exam.
- 2014 David Bjanec, Heuristic spike sort tuner for the determination of an optimal parameter set for a generic spike sorting algorithm, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Douglas J. Weber. MS thesis exam.
- 2013 Haitao Yang, Acquiring uniaxial stress-strain curve by fast finite element analysis for characterization of whole-cell elastic property, Department of Electrical and Computer Engineering, University of Pittsburgh, Supervisor: Guangyong Li. MS thesis exam.

## STUDENT HONOURS AND AWARDS

### Summer and undergraduate student awards

Student	Award	Amount
Henry Phalen	Swanson School of Engineering Summer Research Award. 2017	\$4000
Christian Thomas	Pitt EXCEL Summer Research Internship	\$ 1650
John Teoli	Swanson School of Engineering Summer Research Award. 2013.	\$ 3500
Meng Li	Swanson School of Engineering Summer Research Award. 2012.	\$ 3500
Briar Findlay	CIHR Summer Studentship in Mobility, Musculoskeletal, Oral, and Skin Health and Arthritis Across the Lifespan. 2010	\$ 4950
Yingying Fu	NSERC Undergraduate Summer Research Award. 2009	\$ 4500
Rebecca Jeffery	CIHR Summer Studentship in Mobility, Musculoskeletal, Oral, and Skin Health and Arthritis Across the Lifespan. 2009	\$ 4950
Duluxan Sritharan	NSERC Undergraduate Summer Research Award. 2009	\$ 4500

## PROFESSIONAL ACTIVITIES

### PEER REVIEW COMMITTEES

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2016	External Review, Rehabilitation Research Institute of Singapore
2016	External Review, National Institutes of Health
2014	External Review, Maryland Industrial Partnerships
2013	External Review, NASA
2012	External Review, The Royal Society Wolfson Laboratory Refurbishment Grant, The Royal Society, UK

### JOURNAL EDITORIAL RESPONSIBILITIES

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<b>Area Editor</b>	1. IEEE Signal Processing Magazine (2017- Present)
<b>Associate Editor</b>	1. Biomedical Engineering Online (2017- Present) 2. IEEE Transactions on Biomedical Engineering (2017- Present)
<b>Reviewer</b>	1. Acta Acustica united with Acustica 2. AEU International Journal of Electronics and Communications 3. Age and Ageing 4. AGE: Journal of the American Aging Association 5. American Journal of Physical Medicine and Rehabilitation 6. Annals of Biomedical Engineering 7. Applied and Computational Harmonic Analysis 8. Autonomic Neuroscience: Basic and Clinical 9. Behavioural Brain Research 10. Biological Psychology 11. Biomedical Engineering Letters 12. Biomedical Signal Processing and Control 13. Biomedicine and Pharmacotherapy 14. BMC Anesthesiology 15. Brain Research 16. Circuits, Systems & Signal Processing 17. Chemosensory Perception 18. China Communications 19. Clinical EEG & Neuroscience 20. Clinical Interventions in Aging 21. Clinical Neurophysiology 22. Computer Methods and Programs in Biomedicine 23. Computers in Biology and Medicine 24. Cognitive Neurodynamics 25. Critical Care

26. Digital Signal Processing
27. Electronics
28. Energies
29. Entropy
30. EURASIP Journal on Advances in Signal Processing
31. Expert Opinion on Drug Delivery
32. Expert Review of Respiratory Medicine
33. Gait and Posture
34. Geotechnical Testing Journal
35. Healthcare Technology Letters
36. Human Factors: The Journal of the Human Factors and Ergonomics Society
37. IEEE Access
38. IEEE Communications Letters
39. IEEE Journal of Biomedical and Health Informatics
40. IEEE Potentials
41. IEEE Review in Biomedical Engineering
42. IEEE Sensors Journal
43. IEEE Signal Processing Letters
44. IEEE Signal Processing Magazine
45. IEEE Transactions on Affective Computing
46. IEEE Transactions on Audio, Speech and Language Processing
47. IEEE Transactions on Biomedical Engineering
48. IEEE Transactions on Cybernetics
49. IEEE Transactions on Geoscience and Remote Sensing
50. IEEE Transactions on Haptics
51. IEEE Transactions on Information Technology in BioMedicine
52. IEEE Transactions on Instrumentation and Measurement
53. IEEE Transactions on Neural Networks and Learning Systems
54. IEEE Transactions on Signal and Information Processing over Networks
55. IEEE Transactions on Signal Processing
56. IEEE Transactions on Wireless Communications
57. IET Radar, Sonar & Navigation
58. IET Science, Measurement & Technology
59. International Archives of Otorhinolaryngology
60. International Journal of Adaptive Control and Signal Processing
61. International Journal of Antennas and Propagation
62. International Journal of Cardiology
63. International Journal of Social Robotics
64. International Journal of Speech-Language Pathology
65. Journal of Alzheimer's Disease
66. Journal of Applied Physiology
67. Journal of Computational Science
68. Journal of Gerontology: Medical Science

69. Journal of Healthcare Engineering
70. Journal of Medical and Biological Engineering
71. Journal of Medical Internet Research
72. Journal of Motor Behavior
73. Journal of NeuroEngineering and Rehabilitation
74. Journal of Pseudo-Differential Operators and Applications
75. Journal of Speech, Language, and Hearing Research
76. Journal of Spinal Cord Medicine
77. Journal of Sport Science
78. Journal of Zhejiang University SCIENCE A: Applied Physics & Engineering
79. Mathematics and Computers in Simulation
80. Mathematical Problems in Engineering
81. Medical & Biological Engineering & Computing
82. Medical Engineering & Physics
83. Multidimensional Systems and Signal Processing
84. Neurocomputing
85. NeuroImage
86. Pattern Recognition Letters
87. PeerJ
88. PLoS ONE
89. Proceedings of the IEEE
90. Recent Patents in Engineering
91. Research Letters in Signal Processing
92. Robotics and Autonomous Systems
93. Scientific Reports
94. Signal, Image and Video Processing
95. Signal Processing
96. Shock and Vibration
97. The Journal of the Acoustical Society of America

## CONFERENCE EDITORIAL RESPONSIBILITIES

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| <b>Reviewer</b> | <ol style="list-style-type: none"> <li>1. International Joint Conference on Neural Networks (IJCNN 2016), July 24-29, 2016, Vancouver, BC, Canada</li> <li>2. IEEE International Symposium on Circuits and Systems (ISCAS 2016), May 22-25, 2015, Montreal, QC, Canada</li> <li>3. IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2015), September 17-20, 2015, Boston, MA, USA</li> <li>4. 11<sup>th</sup> International Conference on Sampling Theory and Applications (SampTA 2015), May 25-29, 2015, Washington, DC, USA</li> <li>5. Design of Medical Devices Conference (DMD 2014), April 7-10, 2014, Minneapolis, MN, USA</li> </ol> |
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6. 2nd International Conference on Control and Fault-Tolerant Systems (SysTol'13), October 9-11, 2013, Nice, France
  7. 21<sup>st</sup> European Signal Processing Conference (EUSIPCO 2013), September 3-7, 2013, Marrakech, Morocco
  8. 8<sup>th</sup> International Workshop on Systems, Signal Processing and their Applications (WOSSPA 2013), May 12-15, 2013, Mazafran, Algiers, Algeria
  9. 11<sup>th</sup> International Conference on Information Science, Signal Processing and Their Applications (ISSPA 2012), July 2-5, 2012, Montreal, Quebec, Canada
  10. 2012 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2012), April 29-May 2, 2012, Montreal Quebec, Canada
  11. 10th International Conference on Information Science, Signal Processing and Their Applications (ISSPA 2010), Kuala Lumpur, Malaysia
  12. XXII International Symposium on Information, Communication and Automation Technologies (ICAT 2009), Sarajevo, Bosnia and Herzegovina
  13. 2009 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC 2009), Sapporo, Japan
  14. 16th European Signal Processing Conference (EUSIPCO 2008), Lausanne, Switzerland
  15. 67th IEEE Vehicular Technology Conference: VTC2008-Spring, Singapore

**Associate Editor**

1. 2012 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2012), April 29-May 2, 2012, Montreal Quebec, Canada

**Program Track Co-Chair**

1. 8<sup>th</sup> International Workshop on Systems, Signal Processing and their Applications (WOSSPA 2013), May 12-15, 2013, Mazafran, Algiers, Algeria

**Program Committee**

1. 2nd IEEE International Workshop on Wireless Communications and Networking in Extreme Environments (IEEE WCNEE 2018), April 15-19, 2018, Honolulu, HI, USA – technical program committee member
2. IEEE World Congress on Computational Intelligence (IEEE WCCI), July 25-29, 2015, Vancouver, British Columbia, Canada. Special session on affective brain-computer interaction - program committee member.
3. SPIE Compressive Sensing IV, April 20-21, 2016, Baltimore, Maryland, USA
4. IEEE Global Conference on Signal and Information Processing (GlobalSIP), December 14-16, 2015, Orlando, Florida, USA. Executive member – student travel grant chair.
5. SPIE Compressive Sensing IV, April 22-24, 2015, Baltimore, Maryland, USA
6. 11<sup>th</sup> International Conference on Information Science, Signal Processing and Their Applications (ISSPA 2012), July 2-5, 2012, Montreal, Quebec, Canada
7. XXIII International Symposium on Information, Communication and Automation Technologies (ICAT 2011), Sarajevo, Bosnia and Herzegovina

**Session Chair**

1. SPIE Compressive Sensing V, April 20-21, 2016, Baltimore, Maryland, USA (Special session on compressive sensing signal processing)

2. SPIE Compressive Sensing IV, April 22-24, 2015, Baltimore, Maryland, USA (Special session on compressive sensing signal processing)
3. 2014 Asilomar Conference on Signals, Systems and Computers, November 2-5, 2014, Pacific Grove, California, USA (Special session on neural engineering and signal processing)
4. 21<sup>st</sup> European Signal Processing Conference (EUSIPCO 2013), September 3-7, 2013, Marrakech, Morocco (Special session on sparse signal representation and processing)
5. IEEE Statistical Signal Processing Workshop (SSP'12), August 5-8, 2012, Ann Arbor, Michigan, USA (Poster session on compressive sensing)
6. 11<sup>th</sup> International Conference on Information Science, Signal Processing and Their Applications (ISSPA 2012), July 2-5, 2012, Montreal, Quebec, Canada (Special session on advances in time-frequency analysis and its applications)

**General Chair**

1. Symposium on Signal Processing and Machine Learning in Large Medical Datasets at the Fifth IEEE Global Conference on Signal and Information Processing (GlobalSIP 2017), November 14-16, 2017, Montreal, Quebec, Canada.
2. IEEE Signal Processing Society Summer School on Signal Processing and Machine Learning for Big Data, May 17-19, 2016, Pittsburgh, PA, USA.

**UNIVERSITY SERVICES**


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2015 – Present	Member, Technology Transfer Committee, University of Pittsburgh
2016 – 2017	Member, Faculty search committee (computer engineering), Department of Electrical and Computer Engineering, University of Pittsburgh
2015 – 2016	Member, Faculty search committee (devices), Department of Electrical and Computer Engineering, University of Pittsburgh
2012 – 2015	Member, Graduate committee, Department of Electrical and Computer Engineering, University of Pittsburgh
2015	Faculty mentor, Computer Science, Biology and Biomedical Informatics (CoSBBi), The University of Pittsburgh Cancer Institute (UPCI) Academy
2014 - 2015	Member, Faculty search committee (signal processing), Department of Electrical and Computer Engineering, University of Pittsburgh
2013 – 2014	Member, Innovation and Entrepreneurship Curriculum Reform Committee, Swanson School of Engineering, University of Pittsburgh
2013 – 2014	Member, Graduate admission committee, Intelligent Systems Program, Kenneth P. Dietrich School of Arts and Sciences, University of Pittsburgh
2009	Reviewer, IBBME Scientific Day University of Toronto
2007	Judge, Western Research Forum The University of Western Ontario
2006	Representative of the Faculty of Engineering, Society of Graduate Students The University of Western Ontario

2006	Judge, Western Research Forum The University of Western Ontario
2006	Member, Academic Graduate Committee The University of Western Ontario
2005 – 2006	Founder and President, IEEE Engineering in Medicine and Biology Student Chapter The University of Western Ontario
2004	Representative of the Faculty of Engineering, Society of Graduate Students The University of Western Ontario
2002 – 2003	Executive, Graduate Engineering Society The University of Western Ontario
2000 – 2001	Student Member, Teaching Effectiveness Committee, Faculty of Engineering The University of Western Ontario
2000 – 2001	Vice-President, Undergraduate Engineering Society The University of Western Ontario
1999 - 2000	Director of Communications, Undergraduate Engineering Society The University of Western Ontario

## SCHOLARLY AND PROFESSIONAL AFFILIATIONS

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- Member, American Association for the Advancement of Science
- Member, Biomedical Engineering Society
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
- Senior Member, IEEE Signal Processing Society
- Senior Member, IEEE Engineering in Medicine and Biology Society

## MEDIA COVERAGE

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### Web

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"President Obama Honors Extraordinary Early-Career Scientists"

[www.whitehouse.gov](http://www.whitehouse.gov), Feb. 18, 2016

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27, 2013

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"Pitt researchers propose mathematical model that examines multiple  
walking patterns in older adults" [www.news-medical.net](http://www.news-medical.net), July 3, 2013

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2, 2013

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"Ervin Sejdic named to RFID Center post"

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