CURRICULUM VITAE

Gerwin Schalk, Ph.D.

PERSONAL INFORMATION

Name:	Gerwin Schalk
Date of Birth:	07/06/1971
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WWW:	http://www.gerv.org
Citizenships:	U.S.A., Austria

EXPERIENCE

07/2007 – present **Research Scientist V**
(eq. Associate Professor; tenured 06/08)
Wadsworth Center, NY State Dept. of Health, Albany, NY

12/2007 – present **Associate Professor**
Dept. of Neurology, Albany Medical College, Albany, NY

11/2007 – present **Adjunct Assistant Professor**
Dept. of Neurosurgery, Washington University in St. Louis, St. Louis, MO

08/2008 – present **Adjunct Faculty**
Dept. of Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, NY

09/2008 – present **Associate Professor**
Dept. of Biomedical Sciences, State University of New York at Albany, Albany, NY

08/2010 – present **Adjunct Full Professor**
Dept. of Electrical and Computer Engineering, University of Texas at El Paso, El Paso, TX

02/2005 – 05/2007 **Research Scientist IV (permanent position 10/05)**
11/2001 – 02/2005 **Research Scientist III**
06/1999 – 11/2001 **Research Scientist I**
Wadsworth Center, NY State Dept. of Health, Albany, NY

Major accomplishments:

Computer Science:

- Designed, led development, and project-managed BCI2000 (a general-purpose R&D platform for brain-computer interface research). This system has been provided to more than 2000 users around the world, and has provided the basis for experiments in more than 150 peer-reviewed papers. See grants.
- Designed and led development of a high-end

stimulation and data collection system for research on electrophysiological signals.

Neuroscience:

- Implemented the first brain-computer interface (BCI) based on electrocorticography (ECoG) (see patent).
- Led studies that showed for the first time that ECoG signals give substantial information about actions (such as kinematic parameters of movements) and cognition (such as directional attention and intention).

Innovation:

- Invented and implemented a method to detect events in brain signals in real time (see patent).

Neurophysiology:

- Found a new signal in the EEG (the "error potential") that follows errors in EEG-based communication.
- Found a new signal in ECoG (the "LMP") that encodes movement-related information.

Electrophysiology:

- Invented and implemented an efficient method for pulse train de-interleaving (provisional patent).

08/1997 – 03/1998 **Masters Thesis Research**
Wadsworth Center, NY State Dept. of Health, Albany, NY

1997 **Game Developer**
WO-Design, Fürstenfeld, Austria
- Developed computer game "Memory."

1996 – 1997 **Software Engineer**
- Developed software for computer tomography images.

1995 **Software Engineer**
Vermessungsbüro Schalk, Fürstenfeld, Austria
- Developed tools for GIS systems in Lisp.

1994 **Software/Electrical Engineer**
Cable-TV Fürstenfeld, Austria
- Designed and developed hardware and software for video broadcast system.

1990 – 1996 **Research Scientist**
Messphysik Ges.m.b.H, Fürstenfeld, Austria
- Invented, designed, and implemented an optical extension measurement system based on standard video cameras for use in material testing.

1992 – 1995 **Animation Engineer**
Animated Arts; Graz, Austria
- Professional 2D/3D graphics and animations.

1990 – 1995 **Co-Founder**
FSSF Software Training, Fürstenfeld, Austria

1990 – 1999 Professional PC and network maintenance.

ONGOING GRANT SUPPORT

- **BCI2000: Software for Brain-Computer Interface Research**, Principal Investigator, NIH/NIBIB, 9/1/06-6/30/12, total costs $1.24m, top 2.6th percentile in scientific evaluation.
- **A Brain-Based Communication and Orientation System**, Principal Investigator, US Army Research Office, 6/4/08-6/3/13, total costs $2.2m.
- **General-Purpose Brain-Computer Interface (BCI) System**, Co-Principal Investigator, NIH/NIBIB, 7/1/08-6/30/13, total costs $5.61m.
- **FLEXBIO Integrative Graduate Education Research Traineeship (IGERT)**, Wadsworth PI, Cornell University, 09/01/2008-08/31/2013, annual total costs $355k.
- **Methods for Functional Connectivity Analyses**, Principal Investigator, US Army Research Office, total direct costs $50k, 3/15/12-12/14/12.
- **Electrocorticography Workshop**, Principal Investigator, US Army Research Office, total direct costs $9,865, 10/11/12-10/10/13.

COMPLETED GRANT SUPPORT

- **Brain-Based Communication System Using Imagined Speech**, Principal Investigator, US Army Research Office, 07/1/07-06/30/11, total costs $405k.

PENDING GRANT SUPPORT

- **Brain-Based Reconstruction of Continuous Silent Speech.** Principal Investigator, US Army Research Office, 12/01/12-11/30/15, total costs: $602k. Submitted.

PATENTS

Schalk, G., Carp, J.S., and Wolpaw, J.R. **Detection of Temporal Patterns**. 2002. Provisional patent application filed.

Leuthardt, E., Schalk, G., Moran, D., Ojemann, J., Wolpaw, J.R. **Brain-Computer Interface**. 2003. US Patent #7,120,486. International patent application pending.

Schalk, G. Leuthardt, E., Brunner, P., Wolpaw, J.R. **Method For Analyzing Function of the Brain and Other Complex Systems**. 2006. US patent application pending.

AWARDS/NOMINATIONS

09/2011 g.tec BCI Award 2011 *(group finalist)*

01/2010 Invited to workshop at MIT to sit on expert panel to define the next X Prize on BCI technology; gave keynote address following Ray Kurzweil and John Donoghue

12/2009 Pangborn Award (*for scientific advances that have had or are anticipated to have a broad public health impact*)

10/2009 Who's Who in the East 2010

07/2009 World Technology Award *(nominee in biotechnology)*

07/2009 Who's Who Among Executives and Professionals Throughout the World 2010

09/2008 Best Paper Award from *IEEE T Biomed Eng* for Schalk et al., 2004

06/2008 Who's Who in the World 2009

02/2008 The Saatchi & Saatchi Award For World Changing Ideas *(group finalist)*

06/2007 Who's Who in the World 2008 (25th Anniversary Edition)
Who's Who in America 2008
11/2006 National Academy of Sciences: One of about 100 participants to be invited to Keck Futures Initiative "Smart Prosthetics"
09/2006 Founders Award of Excellence, Rensselaer Polytechnic Institute, for "creativity, leadership, discovery, and the values of pride and responsibility"
07/2006 Who's Who in America 2007
06/2006 Commissioner's Recognition Award, NY State Dept. of Health
06/2006 National Academy of Engineering: Invited participant to "German-American Frontiers of Engineering" symposium
06/2005 Altran Technology Innovation Award *(group winner)*
05/2005 Pirelli *Internet*ional Award *(group winner)*
03/2004 National Academy of Engineering: One of about 100 participants to be invited to "Frontiers of Engineering" symposium
03/2004 Technology Review's TR100: Top Innovators under 35 *(nominated)*
07/1997 Kurt-Goedel Stipend

EDUCATION

2006 **Ph.D.** **Computer and Systems Engineering**
Rensselaer Polytechnic Institute; Troy, NY, USA;
GPA 4.0/4.0

2001 **M.S.** **Information Technology**
Rensselaer Polytechnic Institute; Troy, NY, USA;
(Application area: eBusiness); GPA 4.0/4.0

1999 **M.S.** **Electrical Engineering and Computer Science**
Graz University of Technology, Graz, Austria;
(Application area: medical informatics with a focus on image processing and artificial intelligence)

1995 **B.S.** **Electrical Engineering and Computer Science**
Graz University of Technology, Graz, Austria

QUALIFICATIONS

- Comprehensive understanding of many diverse technical areas (i.e., biosignal processing, software engineering, machine learning).
- Comprehensive understanding of electrophysiological methods for recording brain signals, as well as the corresponding neurophysiology.
- Several important technology innovations (see Patents).
- Several major programming languages. Many of them expert-level (e.g., C++, Matlab). Many others good working knowledge (e.g., Java, SQL, PHP, LabView, Pascal, AutoLisp, 650x + 680x0 assembly).
- Proficient in many software technologies and APIs: e.g., TCP/IP and other Internet protocols, sockets, multi-threading, real-time programming, etc.
- Good working knowledge of theories of aspects of technology/research translation, e.g., technical innovation, intellectual property, and venture capital/angel funding.

LANGUAGES

English (fluent), German (native), Latin

PEER-REVIEWED JOURNAL ARTICLES

Schalk, G., Wolpaw, J.R., McFarland, D.J. and Pfurtscheller, G. **EEG-based communication: presence of an error potential**. Clinical Neurophysiology, 111:2138-2144, 2000.

Wolpaw, J.R., Birbaumer, N., Heetderks, W.J., McFarland, D.J., Peckham, P.H., Schalk, G., Donchin, E., Quatrano, L.A., Robinson, C.J., Vaughan, T.M. **Brain-computer interface technology: a review of the first international meeting**. IEEE Transactions on Rehabilitation Engineering, 8:164-173, 2000.

Schalk, G., Carp, J.S., Wolpaw, J.R. **Temporal transformation of multiunit activity improves identification of single motor units**. Journal of Neuroscience Methods, 114(1):87-98, 2002.

Wolpaw, J.R., McFarland, D.J., Vaughan, T.M., Schalk, G. **The Wadsworth Center brain-computer interface (BCI) research and development program.** IEEE Transactions on Neural Systems & Rehabilitation Engineering. 11(2):204-7, 2003.

Schalk, G., McFarland, D.J., Hinterberger, T., Birbaumer, N., Wolpaw, J.R. **BCI2000: A General-Purpose Brain-Computer Interface (BCI) System.** IEEE Transactions on Biomedical Engineering, 51(6):1034-1043, 2004. Received Best Paper Award by *IEEE T Biomed Eng* in 2008.

Blankertz, B., Mueller, K.R., Curio, G., Vaughan, T.M., Schalk, G., Wolpaw, J.R., Schloegl, A., Neuper, C., Pfurtscheller, G., Hinterberger, T., Schroeder, M., Birbaumer, N. **The BCI Competition 2003: Progress and Perspectives in Detection and Discrimination of EEG Single Trials**. IEEE Transactions on Biomedical Engineering, 51(6):1044-1051, 2004.

Leuthardt, E.C., Schalk, G., Wolpaw, J.R., Ojemann, J.G., Moran, D.W. **A Brain-Computer Interface Using Electrocorticographic Signals in Humans.** Journal of Neural Engineering, 1:63-71, 2004. (Paper rated "Exceptional" by Faculty of 1000 (http://www.facultyof1000.com); a rating that represents the top 1% of all publications).

Mellinger, J., Nijboer, F., Pawelzik, H., Schalk, G., McFarland, D.J., Vaughan, T.M., Wolpaw, J.R., Birbaumer, B., Kuebler, A. **P300 for communication: Evidence from patients with amyotrophic lateral sclerosis (ALS).** Biomedizinische Technik, 49(1):71-74, 2004.

Kuebler, A., Nijboer, F., Mellinger, J., Vaughan, T. M., Pawelzik, H., Schalk, G., McFarland, D. J., Birbaumer, N., Wolpaw, J. R. **Patients with ALS can use sensorimotor rhythms to operate a brain-computer interface.** Neurology, 64(10):1775-1777, 2005.

Chen, Y., Chen, X.Y., Jakeman, L.B., Schalk, G., Stokes, B.T., Wolpaw, J.R. **The Interaction of a New Motor Skill and an Old One: H-Reflex Conditioning and Locomotion in Rats.** The Journal of Neuroscience, 25(29):6898-6906, 2005.

Carp, J.S., Tennissen, A.M., Chen, X.Y., Schalk, G., Wolpaw, J.R. **Long-term spinal reflex studies in awake behaving mice.** Journal of Neuroscience Methods, 149(2):134-43, 2005.

Blankertz, B. Mueller, K.R., Krusienski, D., Schalk, G., Wolpaw, J.R., Schloegl, A., Pfurtscheller, G. Millan, J.R., Schroeder, M., Birbaumer, N. The **BCI Competition III: Validating Alternative Approaches to Actual BCI Problems.** IEEE Trans Neur Sys Rehab Eng, 14(2):153-159, 2006.

Leuthardt, E.C., Miller, K., Schalk, G., Rao, R.N., Ojemann, J.G. **Electrocorticography-Based Brain Computer Interface – The Seattle Experience.** IEEE Trans Neur Sys Rehab Eng, 14(2):194-198, 2006.

Krusienski, D.J., Schalk, G., McFarland, D.J., and Wolpaw, J.R. **A μ-rhythm Matched Filter for Continuous Control of a Brain-Computer Interface.** IEEE Trans Biomed Eng, 54(2):273-280, 2006.

Wilson, J.A., Felton, E.A., Garell, P.C., Schalk, G., Williams, J.C. **ECoG factors underlying multimodal control of a brain-computer interface.** IEEE Trans Neur Sys Rehab Eng, 14(2):246-250, 2006.

Cincotti, F., Bianchi, L., Birch, G., Guger, C., Mellinger, J., Scherer, R., Schmidt, R.N., Suárez, O.Y., Schalk, G. **BCI Meeting 2005 – Workshop on Technology: Hardware and Software.** IEEE Trans Neur Sys Rehab Eng, 14(2):128-131, 2006.

Vaughan, T.M., McFarland, D.J., Schalk, G., Sarnacki, W.A., Krusienski, D.J., Sellers, E.W., Wolpaw, J.R. **The Wadsworth BCI Research and Development Program: At Home With BCI.** IEEE Trans Neur Sys Rehab Eng, 14(2):229-233, 2006.

Leuthardt, E.C., Schalk, G., Moran, D.W., Ojemann, J.G. **The Emerging World of Neuroprosthetics: A Neurosurgical Perspective.** Neurosurgery, 59(1):1-14, July 2006.

Leuthardt, E.C., Miller, K.J., Anderson, N., Schalk, G., Dowling, J., Miller, J., Moran, D., Ojemann, J.G. **Electrocorticographic Frequency Alteration Mapping: A Clinical Technique for Mapping the Motor Cortex.** Neurosurgery, 60(4 Suppl 2): 260-271, 2007.

Miller, K.J., Leuthardt, E.C., Schalk, G., Rao, R.P.N., Anderson, N.R., Moran, D.W., Miller, J.W., Ojemann, J.G. **Spectral Changes in Cortical Surface Potentials During Motor Movement.** Journal of Neuroscience, 27(9): 2424-32, 2007.

Mellinger, J., Schalk, G., Braun, C., Preissl, H., Rosenstiel, W., Birbaumer, N., Kuebler, A. **An MEG-based Brain-Computer Interface (BCI).** NeuroImage, 36(3):581-93, 2007.

Schalk, G., Kubanek, J., Miller, K.J., Anderson, N., Leuthardt, E.C., Ojemann, J.G., Limbrick, D., Moran, D., Gerhardt, L.A., Wolpaw, J.R. **Decoding Two-Dimensional Movement Trajectories Using Electrocorticographic Signals in Humans.** Journal of Neural Engineering, 4:264-275, 2007. This paper was highlighted as one of "the very best research published in Journal of Neural Engineering in 2007."

Schalk, G., Brunner, P., Gerhardt, L.A., Bischof, H., Wolpaw, J.R. **Brain-Computer Interfaces (BCIs): Detection Instead of Classification.** Journal of Neuroscience Methods, 167:51–62, 2008.

Allison, B.Z., McFarland, D.J., Schalk, G., Zheng, S.D., Moore-Jackson, M., Wolpaw, J.R. **Towards an independent brain-computer interface using steady state visual evoked potentials.** Clinical Neurophysiology, 119, 399-408, 2008.

Cincotti, F., Mattia, D., Aloise, F., Bufalari, S., Schalk, G., Oriolo, G., Cherubini, A., Marciani, M.G., Babiloni, F. **Non-Invasive Brain-Computer Interface System: Towards Its Application As Assistive Technology.** Brain Research Bulletin, 75(6):796-803, 2008.

Schalk, G. **Brain-Computer Symbiosis.** Journal of Neural Engineering, 5:1-15, 2008.

Schalk, G., Miller, K.J., Anderson, N.R., Wilson, J.A., Smyth, M.D., Ojemann, J.G., Moran, D.W., Wolpaw, J.R., Leuthardt, E.C. **Two-Dimensional Movement Control Using Electrocorticographic Signals in Humans.** Journal of Neural Engineering, 5:75–84, 2008. This paper was featured as "an article of high interest" by the Journal of Neural Engineering and was subsequently included in "Highlights of 2008."

Schalk, G., Leuthardt, E.C., Ojemann, J.G., Gerhardt, L.A., Wolpaw, J.R. **Real-Time Detection of Event-Related Brain Activity.** NeuroImage, 43:245-249, 2008.

Wisneski, K.J., Anderson, N.R., Schalk, G., Smyth, M.D., Moran, D.W., Leuthardt, E.C. **The Unique Cortical Physiology Associated With Ipsilateral Hand Movements and Neuroprosthetic Implications.** Stroke, 39(12):3351-3359, 2008.

Kipke, D.R., Shain, W., Buzsáki, G., Fetz, E., Henderson, J.M., Hetke, J.F., Schalk, G. **Advanced neurotechnologies for chronic neural interfaces: new horizons and clinical opportunities.** Journal of Neuroscience, 28(46):11830-11838, 2008.

Wilson, J.A., Schalk, G., Walton, L.M., Williams, J.C. **Using an EEG-Based Brain-Computer Interface for Virtual Cursor Movement with BCI2000.** Journal of Visualized Experiments. http://www.jove.com/index/details.stp?id=1319, doi: 10.3791/1319, 2009.

Leuthardt, E.C., Schalk, G., Roland, J., Moran, D.W. **Evolution of Brain-Computer Interfaces – Going Beyond Classic Motor Physiology.** Neurosurgical Focus, 27(1)E4:1-11, 2009.

Brunner, P., Ritaccio, A.L., Lynch, T.M., Emrich, J., Wilson, J.A., Williams, J.C., Aarnoutse, E.J., Ramsey, N.F., Leuthardt, E.C., Bischof, H., Schalk, G. **A Practical Procedure for Real-Time Functional Mapping of Eloquent Cortex Using Electrocorticographic Signals in Humans.** Epilepsy and Behavior, 15:278-286, 2009.

Kubanek, J., Miller, K.J., Ojemann, J.G., Wolpaw, J.R., Schalk, G. **Decoding Flexion of Individual Fingers Using Electrocorticographic Signals in Humans.** Journal of Neural Engineering, 6:066001, 2009.

Vansteensel, M.J., Hermes, D., Aarnoutse, E.J., Bleichner, M.G., Schalk, G., van Rijen, P.C., Leijten, F.S.S., Ramsey, N.F. **Brain-Computer Interfacing Based on Cognitive Control.** Annals of Neurology, 67(6):809-16, 2010.

Wilson, J.A., Mellinger, J., Schalk, G., Williams, J.C. **A Procedure for Measuring Latencies in Brain-Computer Interfaces.** IEEE Trans Biomed Eng, 57(7):1785-1797, 2010.

Wu, M., Wisneski, K., Schalk, G., Sharma, M., Roland, J., Breshears, J., Gaona, C., Leuthardt, E.C. **Electrocorticographic Frequency Alteration Mapping (EFAM) for Extra-Operative Localization of Speech Cortex.** Neurosurgery, 66(2):E407-9, 2010.

Roland, J., Johnston, J., Brunner, P., Schalk, G., Leuthardt, E.C. **Passive Real-Time Identification of Speech and Motor Cortex during an Awake Craniotomy**. Epilepsy and Behavior, 18(1-2): 128-128, 2010.

Schalk, G. **Can Electrocorticography (ECoG) Support Robust and Powerful Brain-Computer Interfaces?** Frontiers in Neuroengineering, 3(9): 1-2, 2010.

Miller, K.J., Schalk, G., Fetz, E.E., den Nijs, M., Ojemann, J.G., Rao, R.P.N. **Cortical Activity During Motor Execution, Motor Imagery, and Imagery-Based Online Feedback.** Proceedings of the National Academy of Sciences, 107(9): 4430-4435, 2010.

Brunner, P., Joshi, S., Briskin, S., Wolpaw, J.R., Bischof, H., Schalk, G. **Does the P300 Speller Depend on Eye Gaze?** Journal of Neural Engineering, 7:056013, 2010. ** *This paper was included in "Highlights of 2010" by Journal of Neural Engineering. It was also the most cited article in its journal in the two years following its publication.* **

Ritaccio, A.L., Brunner, P., Cervenka, M.C., Crone, N., Guger, C., Leuthardt, E., Oostenveld, R., Stacey, W., Schalk, G. **Proceedings of the First International Workshop on Advances in Electrocorticography.** Epilepsy and Behavior, 19(3):204-215, 2010.

Pei, X., Leuthardt, E.C., Brunner, P., Wolpaw, J.R., Schalk, G. **Spatiotemporal Dynamics of Electrocorticographic High Gamma Activity Related To Language Processing.** NeuroImage, 54(4):2960-2972, 2010.

Brunner, P., Ritaccio, A.L., Emrich, J.F., Bischof, H., Schalk, G. **Rapid Communication With a "P300" Matrix Speller Using Electrocorticographic (ECoG) Signals.** Frontiers in Neuroscience. 5:5, 2011.

Brunner, P., Bianchi, L., Guger, C., Cincotti, F., Schalk, G. **Current Trends in Hardware and Software for Brain-Computer Interfaces.** Journal of Neural Engineering, 8, 025001, 2011. ** *This article was downloaded 500 times within 67 days. This puts it in the top 3% of all articles of the publisher for number of downloads within the past year.* **

Gaona, C.M., Sharma, M., Freudenburg, Z.V., Breshears, J.D., Bundy, D.T., Roland, J., Barbour, D.L., Schalk, G., Leuthardt, E.C. **Nonuniform High-Gamma (60–500 Hz) Power Changes Dissociate Cognitive Task and**

Anatomy in Human Cortex. Journal of Neuroscience, 31: 2091-2100, 2011.

Brunner, P., Schalk, G. **Toward a Gaze-Independent Matrix Speller Brain-Computer Interface.** Clinical Neurophysiology, 122(6):1063-4, 2011.

Nam, C.S., Schalk, G., Moore-Jackson, M. **Editorial: Current Trends in Brain-Computer Interface (BCI) Research and Development.** International Journal of Human-Computer Interaction, 27(1), 1-4, 2011.

Leuthardt, E.C., Gaona, C., Sharma, M., Szrama, N., Roland, J., Freudenberg, Z., Solisb, J., Breshears, J., Schalk, G. **Using the Electrocorticographic Speech Network to Control a Brain-Computer Interface in Humans.** Journal of Neural Engineering, 8, 036004, 1-11, 2011. ** *Included in "Featured Articles" by J Neural Eng. This article was downloaded 250 times within 4 days. This puts it in the top 10% of all articles of the publisher for number of downloads within the past quarter. In addition, it was featured as Editor's Choice by Science Translational Medicine: Sci Transl Med 27 July 2011: Vol. 3, Issue 93, p. 93ec118. A figure related to the paper was also included as the cover of this issue of the journal. Finally, this work was a finalist for the 2011 g.tec BCI Award.* **

Pei, X., Barbour, D.L., Leuthardt, E.C., Schalk, G. **Using Brain Signals to Predict Vowels and Consonants in Spoken and Imagined Words.** Journal of Neural Engineering, 13;8(4):046028, 2011.

Gunduz, A., Brunner, P., Leuthard, E.C., Ritaccio, A.L., Pesaran, B., Schalk, G. **Neural Correlates of Covert Attention in Electrocorticographic (ECoG) Signals in Humans.** Frontiers in Human Neuroscience, 5:89, doi: 10.3389/fnhum.2011.00089, 2011.

Wang, Z., Ji, Q., Miller, K.J., Schalk, G. **Prior Knowledge Improves Decoding of Finger Flexion from Electrocorticographic Signals.** Frontiers in Neuroprosthetics, 5:127, doi: 1326 10.3389/fnins.2011.00127, 2011.

Ritaccio, A.L., Boatman-Reich, D., Brunner, P., Cervenka, M.C., Cole, A.J., Crone, N., Duckrow, R., Korzeniewska, A., Litt, B., Miller, K.J., Moran, D.W., Parvizi, J., Viventi, J., Williams, J., Schalk, G. **Proceedings of the Second International Workshop on Advances in Electrocorticography.** Epilepsy and Behavior, 22:4, 641-650, 2011.

Schalk, G., and Leuthardt, E.C. **Brain-Computer Interfaces Using Electrocorticographic (ECoG) Signals.** IEEE Reviews in Biomedical Engineering, 4, 140-154, 2011.

Pei, X., Hill, J., Schalk, G. **Silent Communication.** IEEE Pulse Magazine, 3(1), 43-46, 2012.

Gunduz, A., Brunner, P., Daitch, A., Leuthardt, E.C., Ritaccio, A.L., Pesaran, B., Schalk, G. **Decoding Covert Spatial Attention Using Electrocorticographic (ECoG) Signals in Humans.** NeuroImage, 60(4), 2285-2293, 2012.

Hill, N.J., Gupta, D., Brunner, P., Gunduz, A., Adamo, M.A., Ritaccio, A.L., Schalk, G. **Recording Human Electrocorticographic (ECoG) Signals for**

Neuroscientific Research and Real-time Functional Cortical Mapping. Journal of Visualized Experiments, (64), e3993, DOI: 10.3791/3993, 2012.

Leuthardt, E.C., Pei, X., Breshears, J., Gaona, C., Sharma, M., Freudenburg, Z., Barbour, D., Schalk, G. **Temporal evolution of gamma activity in human cortex during an overt and covert word repetition task.** Frontiers in Human Neuroscience, 6: 99, 2012.

Tangermann, M., Müller, K.R., Aertsen, A., Birbaumer, N., Braun, C., Brunner, C., Leeb, R., Mehring, C., Miller, K.J., Mueller-Putz, G., Nolte, G., Pfurtscheller, G., Preissl, H., Schalk, G., Schlögl, A., Vidaurre, C., Waldert, S., Blankertz, B. **Review of the BCI Competition IV.** Frontiers in Neuroprosthetics, in press.

Wang, Z., Gunduz, A., Brunner, P., Ritaccio, A.L., Ji, Q., Schalk, G. **Decoding Onset and Direction of Movements Using Electrocorticographic (ECoG) Signals in Humans.** Frontiers in Neuroengineering, in press.

Potes, C.M., Gunduz, A., Brunner, P., Schalk, G. **Dynamics of Electrocorticographic (ECoG) Activity in Human Temporal and Frontal Cortical Areas During Music Listening.** NeuroImage, 61(4), 841-848, 2012.

PAPERS IN SUBMISSION OR WILL BE SUBMITTED SHORTLY

Barbour, D.L., Kim, W., Anderson, N.R., Wisneski, K., Schalk, G., Leuthardt, E.C. **Temporal Flow of Information Through Cortical Brain Areas During a Speech Task.** Journal of Neuroscience. In revision.

Taraschenko, O.D., Pei, X., Brunner, P., Ritaccio, A.L., Schalk, G. **EEG-based Assessment of Language Lateralization.** Neurology. Submitted.

Anderson, N., Blakely, T., Schalk, G., Leuthardt, E.C., Moran, D.W. **Electrocorticographic (ECoG) Signals Related to Human Arm Movements.** Clinical EEG and Neuroscience. Submitted.

Pesaran, B., Gunduz, A., Brunner, P., Ritaccio, A., Leuthardt, E.C., Schalk, G. **Attentional modulations in human electrocorticography and the speed of responding.** Journal of Neuroscience. In submission.

PEER-REVIEWED CONFERENCE PROCEEDINGS

Cincotti, F., Aloise, F., Bufalari, S., Schalk, G., Oriolo, G., Cherubini, A., Davide, F., Babiloni, F., Marciani, M.G., Mattia, D. **Non-Invasive Brain-Computer Interface System to Operate Assistive Devices.** Conf Proc IEEE Eng Med Biol Soc., 2532-2535, 2007.

Miller, K.J., Blakely, T., Schalk, G., denNijs, M., Rao, R.P.N., Ojemann, J.G. **Three Cases of Feature Correlation in an Electrocorticographic BCI.** Conf Proc IEEE Eng Med Biol Soc., 5318-5321, 2008.

Schalk, G. **Effective Brain-Computer Interfacing Using BCI2000.** Conf Proc IEEE Eng Med Biol Soc, 5498-5501, 2009.

Miller, K.J., Hermes, D., Schalk, G., Ramsey, N., Jagadeesh, B., denNijs, M., Ojemann, J.G., Rao, R.P.N. **Detection of spontaneous class-specific**

visual stimuli with high temporal accuracy in human electrocorticography. Conf Proc IEEE Eng Med Biol Soc., 6465-6468, 2009.

Schalk, G. **Sensor Modalities for Brain-Computer Interfacing.** Proceedings to the 13th Intl. Conference on Human-Computer Interaction. In: Human-Computer Interaction. Novel Interaction Methods and Techniques. Springer Lecture Notes in Computer Science, 5611:616-622, 2009.

Wang, Z., Ji, Q., Schalk, G., Miller, K.J. **Decoding finger flexion from electrocorticographic signals using sparse Gaussian process.** 20th International Conference on Pattern Recognition (ICPR), 2010.

Wang, Z., Schalk, G., Ji, Q. **Anatomically constrained decoding of finger flexion from electrocorticographic signals.** Neural Information Processing Systems (NIPS) Conference, 2011. ** *This paper was selected as a "Spotlight Presentation," which represents the top 5% of all accepted papers.* **

CONFERENCE PROCEEDINGS

Wolpaw, J.R., McFarland, D.J., Vaughan, T.M., Schalk, G. **Brain-Computer Interfaces for Communication and Control**. Proceedings of the 3rd World Congress on Neurological Rehabilitation, Eds. L. Battistin, M. Dam, P. Tonin, Monduzzi Editore, 2002.

Krusienski, D.J., Schalk, G., McFarland, D.J., Wolpaw, J.R. **Tracking of the Mu Rhythm using an Empirically Derived Matched Filter.** Proc. IEEE International Conference on Neural Engineering, March 2005.

Schalk, G., Wolpaw, J.R. **Recording options for brain-computer interfaces.** Proceedings to the 1st Conference on Augmented Cognition, 2005.

Schalk, G., Leuthardt, E.C., Moran, D., Miller, K.J., Ojemann, J., Wolpaw, J.R. **Towards two-dimensional cursor control using electrocorticographic signals.** Proceedings to the 11th International Conference on Human-Computer Interaction, 2005.

Gunduz, A., Schalk, G. Defense-Related Insights and Solutions from Neuroscience and Neuroengineering. Conf. Proc. SPIE 8058, 805816, doi:10.1117/12.888189, 2011.

INVITED PAPERS

Brunner, P., Schalk, G. **Brain-Computer Interaction.** Proceedings to the 5th Intl. Conference on Augmented Cognition. In: Foundations of Augmented Cognition. Neuroergonomics and Operational Neuroscience. Springer Lecture Notes in Computer Science, 5638:719-723, 2009.

Schachter, S.C., Guttag, J., Schiff, S., Schomer, D.L., and Summit Contributors (incl. Schalk, G.). **Advances in the Application of Technology to Epilepsy: The CIMIT/NIO.** Epilepsy and Behavior, 16(1):3-46, 2009.

BOOK

Schalk, G., and Mellinger, J. **A Practical Guide to Brain-Computer Interfacing With BCI2000.** Springer, ISBN 978-1849960915, 2010.

BOOK CHAPTERS

Mellinger, J., and Schalk, G. **BCI2000: A General-Purpose Software Platform for BCI Research.** In: Brain-Computer Interfaces. MIT Press, NIPS Workshop Series. 2007.

Leuthardt, E.C., Ojemann, J.G., Schalk, G., Moran, D.W. **General Clinical Issues Relevant to Brain-Computer Interfaces.** In: Neuroengineering. Eds. Daniel DiLorenzo et al. Boca Raton: Taylor and Francis Group, 2008.

Wilson, J.A., and Schalk, G. **Using BCI2000 for HCI-Centered BCI Research.** In: Brain-Computer Interfaces: Applying our Minds to Human-Computer Interaction. Eds: A. Nijholt and D. Tan. Springer, ISBN 978-1849962711, p. 261-274, 2010.

Mellinger, J., and Schalk, G. **Using BCI2000 in BCI Research.** In: Brain-Computer Interfaces: Revolutionizing Human-Computer Interaction. Eds: Graimann, Allison, and Pfurtscheller. Springer, Frontiers Collection, ISBN 978-3642020902, p. 259-280, 2011.

Guger, C., 35 other authors, and Schalk, G. **State-of-the-Art in BCI Research: BCI Award 2010.** In: Recent Advances in Brain-Computer Interface Systems. Ed: Reza Fazel, InTech Press, ISBN: 978-953-307-175-6, p. 193-222, 2011.

Schalk, G., Guger, C., Wilson, J.A. **Hardware and Software Technologies.** In: Brain-Computer Interfaces: Principles and Practice. Eds: J.R. Wolpaw and E. Winter-Wolpaw. Oxford University Press, ISBN: 978-0195388855, 2012.

Schalk, G. **Electrocorticography.** In: Brain-Computer Interfaces: Principles and Practice. Eds: J.R. Wolpaw and E. Winter-Wolpaw. Oxford University Press, ISBN: 978-0195388855, 2012.

INVITED TALKS / SEMINARS

"**BCI2000: A Generic Brain-Computer Interface**." Department of Medical Informatics, Technical University of Graz, 06/29/2000.

"**Improved Motor Unit Detection Using the Hough Transform**." Neuro-Muscular Research Center, Boston University, 01/25/2001.

"**Brain-Computer Interfaces for Communication and Control**." NIPS*2001 Brain-Computer Interface Workshop, Whistler, British Columbia, Canada, 12/07/2001.

"**Brain-Computer Interfaces and BCI2000**." Georgia State University, Atlanta, Georgia, 03/12/2002.

"**Brain-Computer Interfaces for Communication and Control**." 8th International Conference on Functional Mapping of the Human Brain, Sendai, Japan, 06/06/2002.

"**General-Purpose Brain-Computer Interface (BCI) System**." 33rd Neural Prosthesis Workshop, National Library of Medicine / NIH, Bethesda, Maryland, 10/16/2002.

"Business in Austria." International Business Panel, Executive MBA Program, Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY, 05/01/2003.

"Brain-Computer Interfaces: Signals, Methods, and Systems." NASA Ames Research Center, Moffett Field, CA, 06/09/2003.

"Brain-Computer Interfaces: Signals, Methods, and Systems." World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, 08/25/2003.

"Brain-Computer Interfaces: Signals, Methods, and Systems." Society for Neuroscience Hudson-Berkshire Chapter, State University of Albany, Albany, NY, 10/27/2003.

"Brain-Computer Interfaces: Signals, Methods, and Systems." Eberhard Karls University of Tübingen, Tübingen, Germany, 12/15/2003.

"Brain-Computer Interfaces: Signals, Methods, and Systems." Seminar Series *New Frontiers in Brain Machine Interface Research*. Institute for Infocomm Research (I^2R), Singapore, 02/23/2004.

"Business in Austria." International Business Panel, Executive MBA Program, Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY, 05/06/2004.

"Introduction to Brain-Computer Interfaces." University of Rome "La Sapienza," Rome, Italy, 06/03/2004.

"Brain-Computer Interfaces: Present and Future." Fondazione Santa Lucia, Rome, Italy, 06/04/2004.

"Brain-Computer Interfaces: Present and Future." University of Washington, Seattle, Washington, 08/02/2004.

"Brain-Computer Interfaces; EGI Amp Server; Event-Detection." Electrical Geodesics, Eugene, Oregon, 08/05/2004.

"Brain-Computer Interfaces: Present and Future." "BrainDays" Symposium, Rudolf Magnus Institute of Neuroscience, University Medical Center, Utrecht, The Netherlands, 10/02/2004.

"News from the Wadsworth BCI R&D Program: Pushing the Envelope." Eberhard-Karls University, Tübingen, Germany, 04/25/2005.

"Towards 2D Brain Control Using ECoG." 11th International Conference on Human-Computer Interaction, Caesars Palace, Las Vegas, Nevada, 07/26/2005.

"Recording Options for Brain-Computer Interfaces." Augmented Cognition Conference / Satellite to 11th International Conference on Human-Computer Interaction, Caesars Palace, Las Vegas, Nevada, 07/26/2005.

"Communicating Directly from the Brain: Brain-Computer Interfaces." Condensed Matter Physics Seminar Series. Rensselaer Polytechnic Institute, Troy, New York, 11/07/2005.

"Brain-Computer Interfaces: Ready for Clinical Use?" Center for Disability Services, Albany, New York, 03/02/2006.

"Brain-Computer Interfaces: Challenges and Perspectives." Rudolf Magnus Institute of Neuroscience, University Medical Center, Utrecht, The

Netherlands, 09/11/2006.

"Brain-Computer Interfacing Using BCI2000." Keynote address, g.tec Brain-Computer Interface Workshop, Graz, Austria, 09/20/2006.

"Direct Communication From the Brain." Guest lecture for course *Services Science, Management, and Engineering*. Department of Information Technology, Rensselaer Polytechnic Institute, Troy, New York, 10/05/2006.

"Brain-Computer Interfaces (BCIs): Towards Clinical Applications." Biomedical Engineering Colloquium, Washington University in St. Louis, St. Louis, Missouri. 11/03/2006.

"Brain Interfacing with Materials." Task group presentation, National Academy of Sciences Keck Futures Initiative "Smart Prosthetics." Beckman Center, Irvine, California. 11/10/2006.

"BCI2000: Software for Brain-Computer Interface Research." Neuroscience Group, Laboratory of Nervous System Disorders, Wadsworth Center, New York State Department of Health, Albany, New York. 11/30/2006.

"Electrocorticography for Brain-Computer Interfacing and Motor/Language Mapping." Neurosciences Grand Rounds, The Neurosciences Institute, Albany Medical Center, Albany, New York. 02/22/2007.

"Communicating Directly From The Brain Using Brain-Computer Interfaces (BCIs)." Wadsworth Center Research Experience for Undergraduates Program, Albany, New York, 06/19/2007.

"Definition of Motor Responses and Brain-Computer Interfacing Using Electrocorticography." Neuroscience Group, Laboratory of Nervous System Disorders, Wadsworth Center, New York State Department of Health, Albany, New York. 07/06/2007.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." International Workshop on Brain-Computer Interface Technology, Beijing, China, 07/23/2007.

"BCI2000: A General-Purpose Brain-Computer Interface System." 2nd BCI2000 Workshop, Beijing, China, 07/24/2007.

"Brain-Computer Interfacing Using Non-Invasive, Intra-Cortical, and Subdural Methods." Max-Planck-Institute for Brain Research, Frankfurt, Germany, 09/25/2007.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." Max-Planck-Institute for Biological Cybernetics, Tübingen, Germany, 10/02/2007.

"Brain-Computer Interfaces: Controlling A Computer With Your Thought." *Science Today* Seminar Series. Bethlehem High School, Delmar, New York, 10/25/07.

"Direct Communication From the Brain." Guest lecture for *BS in IT Capstone Course*. Department of Information Technology, Rensselaer Polytechnic Institute, Troy, New York, 11/19/2007.

"Brain-Computer Interfacing Using Non-Invasive and Invasive Methods." Computer Science and Electrical Engineering Department, Oregon Health & Science University, Beaverton, Oregon, 12/04/2007.

"Electrocorticography (ECoG) for Feedback and Decoding of Function." Workshop on Large Scale Brain Dynamics, Neural Information Processing Systems (NIPS), Whistler, British Columbia, Canada, 12/08/07.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." Institute for Automation, University of Bremen, Bremen, Germany, 01/14/2008.

"Using Electrocorticography for Brain-Computer Interfacing and Detailed Single-Trial Decoding of Human Behavior." Brain Gain Lecture, F.C. Donders Center for Cognitive Neuroimaging, Radboud University Nijmegen, Nijmegen, The Netherlands, 01/15/2008.

"Brain-Computer Interfacing Using Electroencephalography and Electrocorticography." EuroNeuro (European Congress on Neurology, Neurosurgery, Intensive Care and Anesthesiology), Maastricht, The Netherlands, 01/18/2008.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." Bernstein Seminar, Bernstein Center for Computational Neuroscience, Albert-Ludwigs-Universitaet Freiburg, Freiburg, Germany, 01/22/2008.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." MEG Center, Eberhard Karls University of Tübingen, Tübingen, Germany, 01/24/2008.

"A Device For Real-Time Functional Mapping Using ECoG." CIMIT Epilepsy Innovation Summit, Boston, Massachusetts, 05/07/2008.

"Movement Control Using Field Potentials Recorded on the Surface of the Brain." Workshop on Real-Time Brain Interfacing Applications, Mathematical Biosciences Institute, The Ohio State University, Columbus, Ohio, 05/12/2008.

"Brain-Computer Interfacing Using Non-Invasive and Invasive Methods." Workshop Brain-Computer Interfacing in 2008, Utrecht, The Netherlands, 07/03/2008.

"BCI2000: A General-Purpose Brain-Computer Interface System." 4th BCI2000 Workshop, 07/05/08, Utrecht, The Netherlands.

"The BCI2000 Framework." 4th BCI2000 Workshop, Utrecht, The Netherlands, 07/06/08.

"Overview of Available BCI2000 Components." 4th BCI2000 Workshop, Utrecht, The Netherlands, 07/06/08.

"Brain-Computer Interfacing Using Non-Invasive and Invasive Methods." Institute for Computer Graphics and Vision, Graz University of Technology, Graz, Austria, 07/14/08.

"Brain-Based Communication and Orientation." *Multi-disciplinary University Research Initiative* sponsored by the US Army Research Office. University of Maryland College Park, College Park, Maryland, 09/17/2008.

"Using Brain Signals For Clinical Diagnosis and Communication." Center for Neuropharmacology & Neuroscience, Albany Medical College, Albany, New York, 09/24/2008.

"Direct Interaction With The Brain." Guest lecture in *Business Issues for Engineers and Scientists*, Department of Information Technology, Rensselaer Polytechnic Institute, Troy, New York, 10/08/2008.

"Decoding Detailed Information from the Brain Using Electrocorticographic (ECoG) Signals in Humans." Lecture in *Workshop on Research Efforts and Future Directions in Neuroergonomics and Neuromorphics* sponsored by the US Army Research Office. University of Maryland College Park, College Park, Maryland, 10/24/2008.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." University of Pittsburgh, Pittsburgh, Pennsylvania, 10/30/2008.

"BCI2000: A General-Purpose BCI System and its Application to ECoG Signals." g.tec Brain-Computer Interface Workshop, Society for Neuroscience Annual Meeting, Washington, DC, 11/15/2008.

"Combining Fidelity With Practicality: Interrogation of the Brain Using Electrocorticography (ECoG)." Symposium *Advanced Neurotechnologies for Chronic Neural Interfaces: New Horizons and Clinical Opportunities*, Society for Neuroscience Annual Meeting, Washington, DC, 11/17/2008.

"Direct Interaction With The Brain." Guest lecture in *Information Technology Capstone Course*, Department of Information Technology, Rensselaer Polytechnic Institute, Troy, New York, 11/24/2008.

"Using Electrocorticographic (ECoG) Signals in Humans for Communication and Diagnosis." Technical University of Berlin, Berlin, Germany, 12/01/2008.

"Inferring Details of Motor/Language Function Using ECoG Signals in Humans." Workshop *Advances in Theory and Clinical Application of Subdural Recordings*, American Epilepsy Society Annual Meeting, Seattle, Washington, 12/09/2008.

"Using Electrocorticographic (ECoG) Signals in Humans for Communication and Diagnosis." Department of Physiology and Biophysics, University of Washington, Seattle, Washington, 12/10/2008.

"Theory and Application of Subdural Recordings in Humans." Neurosciences Grand Rounds, The Neurosciences Institute, Albany Medical Center, Albany, New York. 12/18/2008.

"Technical Basis for Real-Time Functional Mapping of Eloquent Cortex." Department of Neurology, Weill Cornell Medical Center, New York City, New York. 03/17/2009.

"Brain-Computer Interfacing Using P300 Evoked Potentials." Guest lecture in course *Brain-Computer Interfaces,* Departments of Neurosurgery/Bioengineering, University of Pennsylvania, Philadelphia, Pennsylvania, 03/25/2009.

"Using Electrocorticographic (ECoG) Signals in Humans For Communication and Diagnosis." University of Pennsylvania, Philadelphia, Pennsylvania, 03/25/2009.

"Engineering the Future in Biomedicine: Using Brain Signals for Communication and Diagnosis." IEEE Schenectady Section, Niskayuna, New York, 04/03/2009.

"EEG/ECoG-based BCIs for People with Little or No Motor Function." Seminar *Brain-Computer Interfaces: Frontiers in Neurology and Neuroscience*, American Academy of Neurology Meeting, Seattle, Washington, 04/27/2009.

"Emerging Opportunities in Neuroengineering." University of Pennsylvania, Philadelphia, Pennsylvania, 06/18/2009.

"Theory and Application of Electrocorticographic (ECoG) Signals in Humans." Invited 1.5 hour tutorial, BBCI Workshop 2009, Advances in Neurotechnology, Berlin, Germany, 07/08/2009.

"BCI2000: A General-Purpose BCI System and its Application to ECoG Signals." Tutorial T02: Brain-Computer Interface, HCI International, San Diego, California, 07/19/2009.

"Brain-Computer Interfacing Using Electrocorticography (ECoG)." Swartz Center for Computational Neuroscience, Institute for Neural Computation, University of California San Diego, La Jolla, California, 07/20/2009.

"Brain-Computer Interfacing Using P300 Evoked Potentials." Guest lecture in course *Brain-Computer Interface Systems*, Department of Cognitive Sciences, University of California San Diego, La Jolla, California, 07/21/2009.

"Sensor Modalities for Brain-Computer Interfacing." Session *Brain-Computer Interface (BCI): Towards Understanding Neural Bases of Human-Computer Interaction*, HCI International, San Diego, California, 07/22/2009.

"Brain-Computer Interaction." Session *Applications and Challenges in Neurally-Driven System Interfaces*, Intl. Conference on Augmented Cognition, San Diego, California, 07/22/2009.

"Effective Brain-Computer Interfacing Using BCI2000." Session *Brain-Machine Interface I*, 31st Annual International IEEE EMBS Conference, Minneapolis, Minnesota, 09/05/2009.

"The BCI2000 Framework." 5th BCI2000 Workshop, The Sagamore Conference Center, Bolton Landing, New York, 10/01/2009.

"Overview of Available BCI2000 Components." 5th BCI2000 Workshop, The Sagamore Conference Center, Bolton Landing, New York, 10/01/2009.

"Detecting Detailed Aspects of Behavior in ECoG Signals." International Workshop on Advances in Electrocorticography, Bolton Landing, New York, 10/02/2009.

"Real-Time Data Acquisition, Signal Processing, and Stimulus Presentation Using BCI2000." Workshop *Neural Engineering in Real Time*, Pittsburgh, Pennsylvania, 10/07/2009.

"BCI2000: A General-Purpose BCI System and its Application to ECoG Signals." g.tec Brain-Computer Interface Workshop, Society for Neuroscience Annual Meeting, Chicago, IL, 10/17/2009.

"Using Subdural Signals in Humans for Communication and Diagnosis." Epilepsy Research Program, Georgetown University, Washington, DC, 11/10/2009.

"Real-Time Functional Mapping Using Electrocorticographic Signals." Clinical Neurophysiology Research Seminar, Langone Medical Center, New York University, New York, New York, 11/18/2009.

"Research and Clinical Application of Electrocorticographic Signals in Humans." Helen Wills Neuroscience Institute, University of California Berkeley, Berkeley, CA, 12/1/09.

"Brain-Computer Interfacing Using Electrocorticographic (ECoG) Signals in Humans." Beijing BCI2009 Symposium, Tsinghua University, Beijing, China, 12/05/2009.

"Introduction to BCI2000." 6th BCI2000 Workshop, Tsinghua University, Beijing, China, 12/06/2009.

"Toward Brain-Computer Symbiosis." Keynote Address, X-Prize Workshop on Brain-Computer Interfaces, MIT Campus, Cambridge, MA, 01/07/2010.

"Exciting Directions in Human Electrocorticography." Small Scale Systems and Integration and Packaging Center's Seminar Series, Binghamton University, Binghamton, New York, 01/20/2010.

"Brain-Computer Interfaces: Prospects and Problems." Cog Sci Issues Colloquium, Department of Cognitive Sciences, Rensselaer Polytechnic Institute, Troy, New York, 01/27/2010.

"Neuroscience and Brain-Computer Interface Research Using Signals Recorded from the Surface of the Brain." Hudson Valley-Berkshire Chapter of the Society for Neuroscience, Albany, New York, 02/22/2010.

"Exciting Directions in Human Electrocorticography." University of California San Francisco Medical School, San Francisco, California, 05/28/2010.

"Introduction to BCI2000." 7th BCI2000 Workshop, Asilomar Conference Center, Monterey, California, 05/30/2010.

"Advanced BCI2000 Concepts." 7th BCI2000 Workshop, Asilomar Conference Center, Monterey, California, 05/30/2010.

"Novel Methods and Applications in Brain-Computer Interface Research." U.S. Army Research Laboratory, Aberdeen Proving Ground, Aberdeen MD, 07/21/2010.

"A brain-based communication and orientation system." 2010 US Army DDRE MURI Conference in Arlington, VA, 07/22/2010.

"Emerging Opportunities in Neuroengineering." Graduate School of Biomedical Engineering, The University of New South Wales, Sydney, Australia, 08/27/2010.

"Real-Time Functional Mapping Using Electrocorticographic Signals." Department of Neurology, Seattle Children's Hospital, Seattle, WA, 09/17/2010.

"Inferring Detailed Aspects of Cognition Using Electrocorticographic (ECoG) Signals in Humans." Seattle Children's Research Institute, Seattle, WA, 09/17/2010.

"Encoding of Perception and Cognition in Human Electrocorticographic Signals." Keynote Address, Bernstein Conference on Computational Neuroscience, Berlin, Germany, 09/30/2010.

"Emerging Opportunities in Neuroengineering." Department of Electrical Engineering and Computer Science, Technical University of Berlin, Berlin, Germany, 10/01/2010.

"Using Neuroscience and Neuroengineering to Augment Human Performance." Topical Panel on Neuroscience, 27th Army Science Conference, Orlando, FL, 12/01/2010.

"Exciting Directions in Neuroscience and Neuroengineering." Department of Physical Therapy and Human Movement Sciences, Northwestern University, Feinberg School of Medicine, Chicago, IL, 12/13/10.

"Electrocorticography: A New Window into Brain Function." Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, Boston, MA, 02/22/11.

"Brain-Computer Interfaces: Integrating Bioengineering and Neuroscience Research." Keynote, 37th Annual Northeast Bioengineering Conference, Rensselaer Polytechnic Institute, Troy, New York, 04/03/11.

"Exciting Adventures in Neuroscience and Neuroengineering." Department of Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, New York, 04/06/11.

"Introduction to BCI2000." 8th BCI2000 Workshop, University Medical Center, Utrecht, The Netherlands, 05/18/2011.

"Advanced BCI2000 Concepts." 8th BCI2000 Workshop, University Medical Center, Utrecht, The Netherlands, 05/18/2011.

"Brain-Computer Interfaces: The Hope, The Hype, The Power, and The Pain." Brain-Computer Interfacing in 2011, Rudolf Magnus Institute for Neuroscience, Utrecht, The Netherlands, 05/21/2011.

"Exciting Adventures in Neuroscience and Neuroengineering." Institute for Knowledge Discovery, Graz Technical University, Graz, Austria, 05/23/2011.

"Exciting Adventures in Neuroscience and Neuroengineering." Electrical and Computer Engineering Department, University of Houston, Houston, Texas, 06/20/2011.

"Opportunities for Clinical Application of Emerging Neuroscientific and Neuroengineering Understanding." Neurophysiology Seminar Series, Baylor Hospital, Houston, TX, 8/23/2011.

"BCI2000: A General-Purpose BCI System and its Application to ECoG Signals." g.tec Brain-Computer Interface Workshop, IEEE EMBC Conference, Boston, MA, 8/30/2011.

"BCI2000" FBNCI Cluster Workshop for Roadmap Development, Graz University of Technology, 09/22/2011.

"Communicating Directly with the Brain." EmTech Conference, MIT Campus, 10/19/2011.

"Perspectives on ECoG Research and Application." 3rd International Workshop on Advances in Electrocorticography, Washington, DC, 11/11/2011.

"BCI2000: A General-Purpose BCI System and Its Application to ECoG Signals." g.tec Brain-Computer Interface Workshop, Washington, DC, 11/12/2011.

"Real-Time Functional Mapping Using ECoG." g.tec ECoG/Spike Workshop, Washington, DC, 11/14/2011.

"Real-Time Functional Mapping Using ECoG." g.tec ECoG/Spike Workshop, Washington, DC, 11/14/2011.

"Exciting Opportunities in Neuroscience and Neuroengineering." University of Washington, Seattle, WA, 01/27/2012.

"Using Machines to Read the Mind." Department of Neurology and Neurological Services, Stanford University School of Medicine, Palo Alto, CA, 02/09/2012.

"Advanced Neural Prosthetics: Prospects and Problems." Neuroprosthetics 2012 Conference, Worcester Polytechnic Institute, 02/23/2012.

"Brain-Computer Interfacing Using P300 Evoked Potentials." Guest lecture in course *Brain-Computer Interfaces,* Departments of Neurosurgery/Bioengineering, University of Pennsylvania, Philadelphia, Pennsylvania, 03/20/2012.

"Brain-Computer Interfacing Using P300 Evoked Potentials." Guest lecture in course *Brain-Computer Interfaces,* Electrical and Computer Engineering Department, NYU poly, New York, NY, 03/21/2012.

"Exciting Directions in Neuroscience and Neuroengineering." Electrical and Computer Engineering Department, NYU poly, New York, NY, 03/21/2012.

"Exciting Directions in Neuroscience and Neuroengineering." Kent State University, Kent, OH, 04/18/2012.

"Exciting Directions in Neuroscience and Neuroengineering." Colloquium at Electrical Engineering and Computer Science Department, Case Western Reserve University, Cleveland, OH, 04/19/2012.

"The Exciting World of Brain-Computer Interfacing." Keynote Address, Workshop on "Solving the Mystery of how the Brain Works." Walt Disney Pavilion, Florida Hospital for Children, Orlando, FL, 05/10/2012.

"Communicating Directly With the Brain." Introductory lecture at the initial public presentation of the €20m Italian project "cyber brain." Chamber of Commerce, Avellino, Italy, 06/15/2012.

MEDIA COVERAGE

Scientists advance the creation of bionic men. Chilean Newspaper "La Tercera." By Andrea Ruiz-Tagle. 02/28/2002.

Tapping the Mind. Science Magazine. By Ingrid Wickelgren. 299:496-499, January 2003.

24 Top Austrian Scientists Working Abroad. Austrian Newsweekly "Format." 25:6-7, June 2004.

Moving Thoughts. Innovation Magazine. By Lay-Leng Tan. 4(3):64-65, June 2004.

Control of Prosthetic Devices. Press Conference at Annual Meeting of Society for Neuroscience. One of the 89 (out of 16000) attendees selected. 10/26/2004.

Thought Powers Computer. Seattle Post-Intelligencer. Describes my collaborative project with UW School of Medicine; mentions my name and refers to me as "leader in the brain-computer interface field." 12/16/2004.

Practical Applications of BCIs Near. Promising Developments for Neurology column in Applied Neurology. Prominently features my work with ECoG. January 2005.

Mind Control. Wired Magazine. Mentions my name and my opinion. Issue 13.03. March 2005.

Press Book. Annual Meeting of Society for Neuroscience. One of the 700 (out of 16000) attendees selected. October 2005.

Moves & Milestones. Bridges Magazine. Office of Science & Technology at the Embassy of Austria in Washington, DC. Highlights my current career events. April 2006.

Digitale Telepathie. c't (German computer magazine). Mentions my name, my work on the BCI2000 system, and uses one of my figures. Issue 18. August 2006.

Mit dem Hirn Computer steuern. Hamburger Abendblatt (German newspaper). Mentions my name and my work on the BCI2000 system. August 18, 2006.

Technologie der Telepathie. heute.de by ZDF (public German TV station). Mentions my name, opinion, and my work on the BCI2000 system. August 18, 2006.

Direkter Draht zum Computer. Telepolis (German technology magazine). Mentions my name and vision on brain-computer interface systems. August 24, 2006.

Teenager moves video icons just by imagination. Press release, Washington University in St. Louis, St. Louis, MO. Mentions my work on the BCI2000 system. October 9, 2006.

Brain-Computer Interfaces Come Home. e-Advances Newsletter of NIBIB/NIH. Prominently mentions my opinion and describes the BCI2000 project and my leading role in it. November 28, 2006.

Brain Machine Interfaces. Innovation Watch magazine online article. Mentions the BCI2000 system and my leading role in its development. November 30, 2006.

Moves & Milestones. Bridges Magazine. Office of Science & Technology at the Embassy of Austria in Washington, DC. Highlights my current career events. April 2007.

Draht zum Gehirn. Bild der Wissenschaft (German popular science magazine). Mentions my name and work on the BCI2000 system. June 2007.

Press Book. Annual Meeting of Society for Neuroscience. Each of four submitted abstracts was chosen as one of 700 (out of 16000 total) selected. November 2007.

"Volition, Not Science Fiction," Portrait of [one of] Three Outstanding Austrian Scientists. Bridges Magazine volume 15. Office of Science & Technology at the Embassy of Austria in Washington, DC. http://www.ostina.org/content/view/2584/807. Portrait and career profile. October 2007.

"Brain blanket boosts mind control," *New Scientist* magazine online article. This article highlights my recent work on signals recorded from the surface of the brain (electrocorticography (ECoG)) and quotes my corresponding opinions. February 2008.

"Navi statt im Auto künftig im Gehirn?," Article in science section of German Newspaper "Die Welt." This article describes BCI2000 as the standard software for BCI research, and it quotes my opinion on future BCI developments. February 2008. Online.

"An electrode for your thoughts," The Daily Pioneer newspaper online article. This article describes my studies using signals recorded from the surface of the brain (electrocorticography (ECoG)). It prominently highlights my corresponding opinions. March 3, 2008.

"Control your mouse using your thoughts," Article in *Space and Technology* online magazine. This article describes my recent work using electrocorticographic signals recorded from the surface of the brain for operation of brain-computer interfaces, and quotes my opinions on competing techniques. March, 2008.

"Brain Games," Article in MIT's *Technology Review*. This article quotes my opinions on the use of brain signals for gaming purposes. July/August, 2008.

"Albany Med seeks way to harness brain waves," Article in the *Troy Record*. This article describes my receiving a grant from the US Army and discusses the aim of this project, August 08, 2008.

"New computer-brain interface developed," Online article in ITEXAMINER.com. This article is dedicated to describing my work on ECoG, in particular the studies relating to decoding of finger movements and speech, November 21, 2008.

"Less Invasive Brain Interfaces," Article in MIT's *Technology Review*. This article is dedicated to discussing my recent work on ECoG. November 21, 2008.

"Tongue Control," Article in MIT's *Technology Review*. This article quotes my opinion on the development of a new device that provides feedback to brain signals to the tongue. November 24, 2008.

"New techniques Link Brain with Machine," Online article on the web site of the Dana Foundation. This article is dedicated to describing the promise of my work on ECoG, in particular the studies relating to decoding of finger movements, December 08, 2008.

"Of cells and wires," Article in *The Scientist*. This article describes my recent work on ECoG and its promise for application of BCI technology. Volume 23, Issue 1, Page 32. January 1, 2009.

"Brain-wave technology for the disabled is eye-opening," Article in Independence Today. This article includes a discussion of the BCI2000 system and its substantial impact on research and application of BCI technologies. January 7, 2009.

"BCI Devices Open Doors for People with Disabilities," Article in The O&P Edge. This article features a comprehensive description of my work on the BCI2000 and SIGFRIED technologies. February 2009.

"Brain-Computer Interface Technology Licensed to Missouri Firm," Press release, New York State Department of Health. This release describes the licensing of our ECoG technologies, states my opinion, and gives an account on my accomplishments. March 2009.

"Tweeting with the Brain," Series of articles in Wired Science, CyberneticsNews.com, msnbc.com, University of Wisconsin at Madison (press release), DerStandard.at, HowStuffWorks.com, Obsessable.com, RussiaToday.com, and NewScientist.com. These articles describe a collaborative achievement in which we first connected a Brain-Computer Interface to Twitter. April, 2009.

"Better Brain-Wave Analysis," Article in MIT's *Technology Review*. This article quotes my opinion on a novel method to analyze brain signals. May 26, 2009.

"Reading the Surface of the Brain," Article in MIT's *Technology Review*. This article quotes my opinion and describes the goals of the startup Neurolutions. June 3, 2009.

"Auf dem Weg zum Mini-Hirnrekorder." Article in Germany's *Technology Review* magazine. This article quotes my opinion and describes the goals of the startup Neurolutions. June 8, 2009.

"Catch a Brain Wave and Teach it to Communicate." e-Advances Newsletter of NIBIB/NIH. Highlights the BCI2000 project and my leading role in it, and prominently features my work on ECoG. July 22, 2009.

"Albany Medical College Team Develops Unique Real-Time Brain Mapping System." Press release, Albany Medical College. Highlights our novel brain mapping system and my leading role in this project. This press release prompted an article in the Albany Times Union. August 18, 2009.

"Mind over Matter." Edge of Discovery Series, CNN. Highlights BCI-related research in my group and interviews me on its current state and future prospects. September 23, 2009.

"Thought Translator Knows Vowels from Consonants." Technology Review Editor's Blog. Describes our results on decoding vowels and consonants from ECoG signals. October 21, 2009.

"Fast, Accurate Method for Communicating Using Brain Waves." Press release, Albany Medical Center. Highlights our work on ECoG-based spelling at rates of more than 20 characters per minute. This press release prompted an article in the Albany Times Union. December 29, 2009.

"Is the 'Avatar' concept really possible?" CNN.com. Describes the progress of our work and highlights my opinion in light of the movie 'Avatar.' February 3, 2010.

"Mind Over Matter: Brain Control Interfaces Become a Reality." ExtremeTech.com. Five-page story about an hour-long interview with me about the current state and the future of BCI devices. February 12, 2010.

"Cutting Edge - A Bold Brain-Computer Experiment Goes On Camera." Brain – the inside story, Rotunda, Magazine of the American Museum of Natural History, 35(5), Fall 2010.

"Albany Med Brain Research Featured at American Museum of Natural History." Press release, Albany Medical College. Describes my collaborative studies with Albany Medical College and the resulting exhibit at the American Museum of Natural History. November 23, 2010.

"NeuroFocus Announces World's First Wireless Full-Brain EEG Measurement Headset: Mynd." PR Newswire. Press release about a new wireless headset. Mentions my opinion on this headset. March 21, 2011.

"Thinking Cap: 'Mynd' Is the First Dry, iPhone-Compatible, Portable Brain Scanner." Blog on *Fast Company*. Mentions my opinion on this headset. March 21, 2011.

"Silent Warrior." Discover Magazine. This 9-page article features my work on a brain-computer interface using imagined speech. April 2011.

"Mind Reading: Technology Turns Thought Into Action." 8-minute piece on my research featured on Morning Edition of National Public Radio (NPR), and on the front page on npr.com. May 12, 2011.

"Unlocking the Matrix of the Human Mind." The DOH Insider. Article about my current work on brain-computer interfaces and ECoG, and its potential for health-related applications. June 27, 2011.

"Someday Your Brain Could Brake for You." Article about work on a brain-assisted breaking system that quotes my opinion. Technology Review online, July 28, 2011.

"New Research Uncovers Marvels of the Mind." Article about my work. Public Employee Federation Communicator Magazine, July, 2011.

"The Cyborg in Us All." Article by Pagan Kennedy about my vision and my work. New York Times Magazine (Sunday Edition), September 18, 2011.

"Mind Reading? Moving Objects with Your Thoughts? " Article about my work and collaborations with Albany Medical College. Albany-Colonie

Regional Chamber of Commerce 'Visions' magazine. September/October, 2011.

"Improving Brain-Computer Interfaces." Article by Kirk Kroeker about brain-computer interfacing, which describes my contributions to the field and my vision for the future. Communications of the Association for Computing Machinery (ACM), October, 2011.

"Thought-Controlled Computers May Soon Be A Reality." Article about my presentation of my vision of brain-computer interaction at the emtech 2011 conference at MIT. Computerworld Magazine online, October 19, 2011. Led to articles on kotaku.com, Gamasutra, VGChartz, GamePro, Le Monde, IDG Now!, Neurogadget, and Gamespy.com.

"The Next Step in Bionics." Feature on advanced bionics that highlights my collaborative research with Albany Medical College. CBS News *Sunday Morning*, October 9, 2011.

"An Ultrathin Brain Implant Monitors Seizures." Article about a new generation of implantable brain signal sensors developed at the University of Pennsylvania. The article quotes my opinion on these sensors. MIT Technology Review, November 18, 2011.

"5 Working Brain-Computer Apps." Article about a new products and research in the area of brain-computer interfaces. The article quotes my opinion on a recent study. The Next Web, December 03, 2011.

"Predictions: Technology." Thought-based communication is listed as one of the best predictions for technologies that will be available in 25 years. Our work in this area is listed as the source for that prediction. The Futurist Magazine, January-February 2012, Vol. 41, No. 1, 2012.

"Mind over Matter. Envisioning a world of thought-controlled computing." Scienceline magazine, January 12, 2012.

"The City of the Future; An Interface Revolution." This article describes our work on mental telepathy among the technologies that will be available around 2045. LaserFocusWorld, March 2012.

"The Monocle Daily." Live radio interview on Monocle 24 about my opinion on a recent study published by Dr. Jose Millan in Switzerland. Monocle is a premium media brand with magazine, web, broadcast and retail divisions focusing on global affairs, business, culture and design. April 25, 2012.

"Gerwin Schalk: Studi per potenziare il cervello." Article in Italian newspaper following my lecture on the potential of brain-computer interfaces in Avellino, Italy. June 15, 2012.

SCIENTIFIC SERVICE AND ORGANIZATION

Chair for session *Brain Computer Interfaces and Augmentative & Alternative Communication*. World Congress on Medical Physics and Biomedical Engineering, Sydney, Australia, August 25, 2003.

Organizer, 1st BCI2000 Workshop, The Desmond Conference Center, Albany, New York, June 13-14, 2005.

Co-Organizer, Workshop on Technology, Third International Meeting on Brain-Computer Interface Technology, Rensselaerville, New York, June 14-19, 2005.

Spokesperson for task group "Brain Interfacing with Materials." National Academy of Sciences: Keck Futures Initiative "Smart Prosthetics." Beckman Center, Irvine, California. November 10, 2006.

Organizer, 2nd BCI2000 Workshop, and Co-Organizer, International Workshop on Brain–Computer Interface Technology, Beijing, China, July 23-24, 2007.

Co-Organizer, 3rd BCI2000 Workshop, Rome, Italy, December 5-6, 2007.

Organizer, 4th BCI2000 Workshop, Utrecht, The Netherlands, July 5-6, 2008.

Co-Organizer, Workshop *Advances in Theory and Clinical Application of Subdural Recordings*, American Epilepsy Society Annual Meeting, December 9, 2008.

Co-Organizer, session "Brain-Computer Interface (BCI): Towards Understanding Neural Bases of Human-Computer Interaction," Human-Computer Interaction (HCI) International 2009, San Diego, California, July 19-24, 2009.

Guest editor, special issue of the International Journal of Human-Computer Interaction (IJHCI), "Current Trends in BCI Research and Development." August, 2009.

Chair for session *Brain-Machine Interface II*. IEEE EMBS Conference, Minneapolis, Minnesota, September 05, 2009.

Co-Organizer, *5th BCI2000 Workshop and International Workshop on Advances in Electrocorticography*, The Sagamore Resort and Conference Center, Bolton Landing, New York, October 1-3, 2009.

Committee Member, Student Recruitment, Department of Biomedical Science, State University of New York at Albany, 2009-2012.

Organizer, *6th BCI2000 Workshop*, Tsinghua University, Beijing, P.R. China, December 6, 2009.

Organizer, *7th BCI2000 Workshop*, Asilomar Conference Center, Monterey, CA, May 30-31, 2010.

Chair of Evaluation Committee, g.tec's Annual BCI Research Award 2010.

Co-Editor, Special Issue on Brain-Computer Interfaces, International Journal on Human-Computer Interaction, 2010.

Co-Organizer, 2*nd* International *Workshop on Advances in Electr-ocorticography*, Marriott Hotel and Marina, San Diego, CA, Nov 11-12, 2010.

Co-Organizer, 8*th BCI2000 Workshop*, University Medical Center, Utrecht, The Netherlands, May 18-19, 2011.

Co-Organizer, 3rd International *Workshop on Advances in Electro-corticography*, Washington Convention Center, Washington, DC, Nov 10-11, 2011.

Chair, Recruitment Committee, Department of Biomedical Science, State University of New York at Albany, 2012-present.

EDITORIAL ACTIVITIES

2010-current Associate Editor, *IEEE* Transactions on Biomedical Engineering

REVIEWER FOR

- Engineering: Frontiers in Neuroengineering, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Neural Systems and Rehabilitation Engineering, IEEE Engineering in Medicine and Biology Magazine, IEEE EMBS Conference on Neural Engineering, Journal of Neural Engineering, Medical Engineering & Physics, MIT Press, Neural Information Processing Systems (NIPS), Neural Networks, Neuroinformatics, Systems, Man and Cybernetics
- Neuroscience: Cognitive Processing, Journal of Computational Neuroscience, Neuron, Neuroscience Letters
- Science, General: PLoS One, Proceedings of the National Academy of Sciences
- Others: International Journal of Human-Computer Interaction, Organizational Behavior and Human Decision Processes

GRANT REVIEWS

International:

- Germany: German Government/DLR (1: Bernstein Centers for Neurotechnology; 2: Bernstein Focus "Neuronal bases of learning")
- The Netherlands: 1: Dutch Technology Foundation of the Netherlands Organization for Scientific research and Dutch Ministry of Economic Affairs; 2: Dutch-Chinese Joint Scientific Thematic Research Programme
- Switzerland: SystemsX.ch initiative, Swiss National Science Foundation
- Belgium: Research Foundation Flanders

Domestic:

- NIH (Centers for Biomedical Research Excellence (COBRE (P20)), ZRG1 BBBP-E, BDCN F10, ZNS1 SRB-M (58), ZRG1 BST-M (58), ETTTN E10, ZDC1 SRB-Y (55))
- NSF (Cognitive Neuroscience Program, Major Research Instrumentation)
- US Army Research Office
- Kentucky Science & Engineering Foundation

PROFESSORSHIP REVIEWS

International:

- Technical University of Berlin
  Tenured professorship in neurotechnology
- Ecole Polytechnique Federale de Lausanne (EPFL)
  Faculty in neuroprosthetics

SCIENTIFIC SOCIETIES

2002- Member, Sigma Xi
2002- Member, Society for Neuroscience
2004- Member, IEEE Medicine and Biology
2008- Scientific Advisor, Neuroscience Board, The Lifeboat Foundation
2010- Member, New York Academy of Sciences

TEACHING AND SUPERVISORY ACTIVITIES

- Designed curricula for and taught three IT-related courses in private industry (Introduction to AMIGA-OS, Introduction to MS-DOS, Introduction to DBase-IV)
- Co-designed and co-taught course "Brain-Computer Interfacing;" Dept. of Biomed. Sci., State Univ. of New York at Albany, Spring, 2010
- Guest lecturer in 13 graduate-level courses (Executive MBA Program, Lally School of Management, Rensselaer Polytechnic Institute (2003, 2004); Services Science, Management, and Engineering, Department of Information Technology, Rensselaer Polytechnic Institute (2006); Business Issues for Engineers and Scientists, Department of Information Technology, Rensselaer Polytechnic Institute (2008); Brain-Computer Interface Systems, Dept. of Cognitive Sciences, University of California San Diego (2009); Information Technology Capstone, Department of Information Technology, Rensselaer Polytechnic Institute (2007, 2008, 2009); Brain-Computer Interfaces, NYU poly (2012); Brain-Computer Interfaces, University of Pennsylvania (2009, 2010, 2011, 2012))
- Currently supervising three doctoral students (P. Brunner, Univ Graz; C. Potes, Dept. of Elect. and Comp. Eng., University of Texas, El Paso; W. Coon, BMS Program, SUNY Albany), and committee member of one doctoral student (C. Boulay, BMS Program, SUNY Albany)
- Mentored 13 graduate students (N. Anderson, WashU; K.J. Miller, UWash; J. Mellinger, U Tuebingen; J. Wilson, U Wisconsin; J. Metzler, G. Fabiani, J. Miklautz, G. Malischnig, A. Dantele, P. Mandl, U. Mochty, Univ Graz; Javier Temprano, University of Valladolid; Juan Carlos Montes Castillo, University of Malaga; Helene Floriach, University Paul Sabatier, Toulouse, France)
- Supervised two Masters students (J. Kubanek, Czech Tech; P. Brunner, Univ Graz; M. Neuper, Univ. Graz) and two doctoral students (J. Fialkoff, Rensselaer Polytechnic Institute; Adam Wilson, University of Wisconsin)

ENTREPRENEURIAL ACTIVITIES

- Co-Founder: FSSF Software Training, Fürstenfeld, Austria. Built a successful business without external funding, 1990-1995.
- Co-Founder: Neurolutions, Inc., St. Louis, Missouri, 2008-present.
- Sci. Advisor: Motalen, Inc., Troy, New York, 2011-2012.
- Consultant: Neurofocus, Inc., Pacific Development and Techn., LLC.

ABSTRACTS

Schalk, G., Wolpaw, J.R., McFarland, D.J., and Pfurtscheller, G. **EEG-based communication: presence of an error potential**. Society for Neuroscience Abstracts 24(1):657, 1998.

Schalk, G., Carp, J.S., Chen, X.Y., Maniccia-Stark, D.M. and Wolpaw, J.R. **Chronic recording of single motor units in rats: methods development**. Society for Neuroscience Abstracts 25(1):655, 1999.

Schalk, G., Carp, J.S., Chen, X.Y. and Wolpaw, J.R. **Assessment of motor unit firing behavior during H-reflex elicitation in rats**. Society for Neuroscience Abstracts 26(2):2206, 2000.

Malischnig, G., McFarland, D.J., Vaughan, T.M., Schalk, G., Goncharova, I.I., Pfurtscheller, G. and Wolpaw, J.R. **Development of online detection of EMG contamination during EEG-based brain-computer interface operation**. Society for Neuroscience Abstracts 26(1):1229, 2000.

Wolpaw, J.R., Schalk, G., McFarland, D.J., Hinterberger, T., Perelmouter, J., Godde, B., Birbaumer, N. and Pfurtscheller, G. **BCI2000: A general purpose brain-computer interface**. Society for Neuroscience Abstracts 26(1):1229, 2000.

Carp, J.S., Schalk, G., Chen, X.Y. and Wolpaw, J.R. **Total electromyographic activity during H-reflex operant conditioning**. Society for Neuroscience Abstracts 26(2):2206, 2000.

Vaughan, T.M., McFarland, D.J., Schalk, G., Sarnacki, W.A., Robinson, L., Wolpaw, J.R. **EEG-based brain-computer-interface: development of a speller**. Society for Neuroscience Abstracts 27(1):167, 2001.

Schalk, G., McFarland, D.J., Hinterberger, T., Birbaumer, N., Wolpaw, J.R. **BCI2000: Development of a general-purpose brain-computer interface (BCI) system**. Society for Neuroscience Abstracts 27(1):168, 2001.

Wolpaw, J.R., Chen, X.Y., Schalk, G. **Assessment of reciprocal and presynaptic inhibition in freely moving rats**. Society for Neuroscience Abstracts 27(1):790, 2001.

Tennissen, A.M., Chen, X.Y., Schalk, G., Chen, L., Wolpaw, J.R. **Assessment of the effects of H-reflex conditioning on locomotion in normal and spinal cord injured rats**. Society for Neuroscience Abstracts 27(1):790, 2001.

Carp, J.S., Schalk, G., Chen, X.Y., Wolpaw, J.R. **H-Reflex operant conditioning effect on ongoing EMG**. Society for Neuroscience Abstracts 28, 2002.

Schalk, G., McFarland, D.J., Hinterberger, T., Birbaumer, N., Wolpaw, J.R. **Brain-computer interfaces (BCIs): signal processing with BCI2000**. Society for Neuroscience Abstracts 28, 2002.

Tennissen, A.M., Chen, X.Y., Chen, L., Schalk, G., Wolpaw, J.R., Jakeman, L.B., Chen, Y., Stokes, B.T. **H-Reflex conditioning effects on reflexes during locomotion in normal & spinal cord-injured rats.** Society for Neuroscience Abstracts 28, 2002.

Vaughan, T.M., McFarland, D.J., Schalk, G., Wolpaw, J.R. **Second international brain-computer interface (BCI) conference: moving beyond demonstrations.** Society for Neuroscience Abstracts 28, 2002.

Vaughan, T.M., McFarland, D.J., Schalk, G., Goncharova, I., Wolpaw, J.R. **A brain-computer-interface (BCI) using sensorimotor cortex rhythms and related phenomena.** 3rd Forum of European Neuroscience, Paris, France, 2002.

Chen, X.Y., Chen, L., Chen, Y., Liu, R.L., Schalk, G., Jakeman, L.B., Stokes, B.T. Wolpaw, J.R. **Down-conditioning of soleus H-reflex reduces the H-**

reflex and affects soleus activity during locomotion. Society for Neuroscience Abstracts, 2003.

Wang, Y., Diao, R., Schalk, G., Wolpaw, J.R., Chen, X.Y. **Effects of H-reflex down-conditioning on GABAergic terminals on rat soleus motoneurons.** Society for Neuroscience Abstracts, 2003.

McFarland, D.J., Sarnacki, W.A., Schalk, G., Wolpaw, J.R. **EEG-based brain-computer interface (BCI): Real-time adaptation of feature weights.** Society for Neuroscience Abstracts, 2003.

Mochty, U., McFarland, D.J., Vaughan, T.M., Birbaumer, N., Schalk, G., Wolpaw, J.R., Neuper, C. **EEG-based communication: Detection of errors during early training of new users.** Society for Neuroscience Abstracts, 2003.

Vaughan, T.M., McFarland, D.J., Schalk, G., Sellers, E., Wolpaw, J.R. **Multichannel data from a brain-computer interface (BCI) speller using a P300 (i.e., oddball) protocol.** Society for Neuroscience Abstracts, 2003.

Leuthardt, E.C., Schalk, G., Chicoine, M., Wolpaw, J.R., Ojemann, J., Moran, D. **Developing a brain computer interface using electrocorticographic signals from subdural electrode arrays in humans.** Society for Neuroscience Abstracts, 2003.

Leuthardt, E.C., Schalk, G., Wolpaw, J.R., Gilliam, F., Ojemann, J., Moran, D. **Developing A Brain Computer Interface Utilizing Subdural Electrodes in Seizure Monitored Patients.** Congress of Neurological Surgeons Annual Meeting, 2003.

Sellers, E., Schalk, G., Donchin, E. **The P300 as a typing tool: Tests of brain computer interface with an ALS patient.** Psychophysiology, 40 (suppl. 1), S77, 2003.

Sellers, E., Schalk, G. Donchin, E. **The P300 as a typing tool: Tests of brain computer interface with an ALS patient.** DARPA Augmented Cognition Conference: Improving Warfighter Information Intake Under Stress, Orlando, FL, 2004.

Sellers, E., Donchin, E., Schalk, G. **A P300 Based Brain-Computer Interface (BCI): Moving Toward a Communication System for the Locked-In.** Annual Meeting of the Society for Psychophysiological Research, Santa Fe, NM, 2004.

Mellinger, J., Nijboer, F., Schalk, G., McFarland, D.J., Vaughan, T.M., Wolpaw, J.R., Birbaumer, N. and Kuebler, A. **Brain-Computer Interfaces (BCIs): Comparing the performance of different brain signals using BCI2000.** Annual Meeting of the Society for Psychophysiological Research, Santa Fe, NM, 2004.

Schalk, G., Leuthardt, E.C., Moran, D., Ojemann, J., Wolpaw, J.R. **Two-Dimensional Cursor Control Using Electrocorticographic Signals in Humans.** Society Program No. 421.9. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online. This abstract was selected, as one of 89 out of a total of 16000, for a press conference.

Nijboer, F., Kuebler, A., Mellinger, J., McFarland, D.J., Schalk, G., Wilhelm, B., Matuz, T., Godde, B., Neumann, N., Wolpaw, J.R., Vaughan, T.M.,Birbaumer, N. **Psychological Variables During Brain-Computer Interface Use In People With Amyotrophic Lateral Sclerosis (ALS).** Program No. 421.8. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online.

Kuebler, A., Nijboer, F., Mellinger, J., Vaughan, T.M., McFarland, D.J., Schalk, G., Matuz, T., Neumann, N., Wilhelm, B., Sheikh, H.Z., Birbaumer, N., Wolpaw, J.R. **Sensorimotor Rhythm-Based Brain-Computer Interface Training In People With Amyotrophic Lateral Sclerosis (ALS).** Program No. 421.7. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online.

Mellinger, J., Nijboer, F., Pawelzik, H., Schalk, G., McFarland, D.J., Vaughan, T.M., Wolpaw, J.R., Birbaumer, N. and Kuebler, A. **P300 For Communication: Evidence From Patients With Amyotrophic Lateral Sclerosis (ALS).** 2nd International Brain-Computer Interface Workshop and Training Course 2004, Graz University of Technology, Austria, Sept.

Allison, B.Z., McFarland, D.J., Wolpaw, J.R., Moore, M.M., Schalk, G., Zheng, S.D. **Toward improved SSVEP BCI systems.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Brunner, P., Schalk, G., Bischof, H., Wolpaw, J.R. **SIGRIED and its application to brain-computer interfaces (BCIs)**. Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Felton, E.A., Wilson, J.A., Schalk, G., Garell, P.C., Williams, J.C. **Brain-computer interface research at the University of Wisconsin-Madison.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

McFarland, D.J., Vaughan, T.M., Schalk, G., Sarnacki, W.A., Krusienski, D.J., Sellers, E.W., Wolpaw, J.R. **The Wadsworth BCI research and development program: demonstrations of current work.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Mellinger, J., Braun, C., Preissl, H., Schalk, G., Birbaumer, N., Kübler, A. **Real-time feedback of magneto-encephalographically (MEG) recorded brain signals.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Miller, K.J., Schalk, G., Rao, R., Ojemann, J.G. **One-dimensional cursor control and initial studies with two-dimensional cursor control using electrocorticographic signals in humans.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Miller, K.J., Schalk, G., Rao, R., Ojemann, J.G. **Identifying and using ECoG signals for BCI control using actual and imagined movements.** Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005.

Mellinger, J., Schalk, G., Braun, C., Preissl, H., Birbaumer, N., Kübler, A. **A brain-computer interface (BCI) based on magneto-encephalography**

(MEG). Society for Psychophysiological Research Annual Meeting, Lisbon, Portugal, Sept, 2005.

Miller, K.J., Schalk, G., Ojemann, J.G., Rao, R. **Robust classification of electrocorticographic signals for BCI.** Neural Information Processing Systems Annual Meeting, Vancouver, Canada, December, 2005.

Nijboer, F., Mochty, U., Mellinger, J., Matuz, T., Jordan, M., Sellers, E., Vaughan, T.M., McFarland, D.J., Schalk, G., Wolpaw, J.R., Birbaumer, N., Kübler, A. **Comparing sensorimotor rhythms, slow cortical potentials, and P300 for brain-computer interface (BCI) use by ALS patients - a within subjects design**. Brain-Computer Interface Technology, Third International Meeting, Rensselaerville, NY, June 2005 (Vidal Poster Prize).

Schalk, G., Koszer, S., Ojemann, J.G., Gerhardt, L.A., Wolpaw, J.R. **Real-Time Subdural Language and Sensorimotor Mapping of the Cortical Surface Without Electrical Stimulation.** Abstract, American Epilepsy Society Annual Meeting 2005. This conference presentation resulted in a written personal invitation from the Editor-In-Chief of the journal "Epilepsy and Behavior" to publish this work in this journal.

Allison, B.Z., McFarland, D.J., Wolpaw, J.R., Vaughan, T.M., Schalk, G., Zheng, S.D., Moore, M.M. **An independent SSVEP BCI.** Program No. 707.8. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

McFarland, D.J., Sarnacki, W.A., Wolpaw, J.R. **Reach and select with a noninvasive brain-computer interface in humans: emulating full mouse control.** Program No. 520.9. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Krusienski, D.J., Schalk, G., McFarland, D.J., Allison, B.Z., Wolpaw, J.R. **A matched-filtering approach for enhancing detection and tracking of EEG control signals in a brain-computer interface.** Program No. 520.10. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Schalk, G., Gerhardt, L.A., Wolpaw, J.R. **Live from the brain: real-time visualization of brain function and its application to brain-computer interfaces (BCIS).** Program No. 520.12. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online. This abstract was selected, as one of 700 out of a total of 16000, for a press book.

Nijboer, F., Mellinger, J., Matuz, T., Mochty, U., Sellers, E., Vaughan, T.M., McFarland, D.J., Schalk, G., Wolpaw, J.R., Birbaumer, N., Kuebler, A. **Comparing sensorimotor rhythms, slow cortical potentials, and P300 for brain-computer interface (BCI) use by ALS patients.** Program No. 520.13. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Miller, K.J., Schalk, G., Miller, J.W., Rao, R.P.N., Leuthardt, E.C., Zacks, J.M., Ojemann, J.G. **Selective attention effects associated with very high frequency changes in human occipital cortex.** Program No. 642.10. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Brunner, P., Schalk, G., Bischof, H., Wolpaw, J.R. **Rapid signal identification for brain-computer interface (BCI) experiments.** Program No. 256.6. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Schalk, G., Kubanek, J., Miller, K.J., Anderson, N., Leuthardt, E.C., Ojemann, J.G., Limbrick, D., Moran, D.W., Gerhardt, L.A., Wolpaw, J.R. **Decoding two-dimensional movement trajectories using electrocorticographic signals in humans.** Program No. 256.7. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Sellers, E.W., Vaughan, T.M., McFarland, D.J., Krusienski, D.J., Mackler, S.A., Cardillo, R.A., Schalk, G., Binder-Macleod, S.A., Wolpaw, J.R. **Daily use of a brain-computer interface by a man with ALS.** Program No. 256.1. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Miller, K.J., Schalk, G., Moran, D.W., Ojemann, J.G., Leuthardt, E.C. **Electrocorticographic analysis of motor speech.** Program No. 263.9. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Miller, K.J., Leuthardt, E.C., Schalk, G., Anderson, N., Rao, R.P.N., Moran, D.W., Ojemann, J.G. **Focal electrocorticographic activation associated with motor tasks in 20 human subjects.** Program No. 705.11. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Wolpaw, J.R., Chen, L., Schalk, G., Chen, X.Y. **Sensorimotor cortex activity during operant conditioning of H-reflex in rats: initial studies.** Program No. 146.1. 2006 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2006. Online.

Schalk, G., Cincotti, F., Mellinger, J. **General-Purpose System for Real-Time Processing and Feedback of Biosignals.** 12th International Conference on Human-Computer Interaction, Beijing, China, July 2007.

Brunner, P., Kubanek, J., Anderson, N., Aarnoutse, E., Ramsey, N., Ritaccio, A., Leuthardt, E.C., Wolpaw, J.R., Schalk, G. **Real-Time Subdural Mapping of Task-Related and Epileptic Activity.** American Epilepsy Society Annual Meeting, December 2007. Online.

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