

Curriculum vitae

Name: Béla Weiss
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Education:

2005-2008 Pázmány Péter Catholic University, Faculty of Information Technology, Interdisciplinary Doctoral School (Budapest, Hungary), supervisor Dr. Tamás Roska , advisers Dr. György Karmos and Dr. Zsuzsanna Vágó
2004-2008 Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics (Budapest, Hungary), M.Sc. in biomedical engineering
1999-2005 Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics (Budapest, Hungary), M.Sc. in electrical engineering (specialization: embedded information systems)
1998-1999 Ballasi Institute (Budapest, Hungary), mathematics-physics
1994-1998 Nikola Tesla Electrotechnical and Architectonic High School (Zrenjanin, Yugoslavia), specialization in automatics
1986-1994 Miloje Čiplić Elementary School (Novi Bečej, Yugoslavia)

Affiliations:

2008- Pázmány Péter Catholic University, Faculty of Information Technology, research assistant
2005-2008 Pázmány Péter Catholic University, Faculty of Information Technology, fellowship

Research interests:

- biomedical signal and image processing
- brain-computer interfaces
- computational neuroscience
- cognitive neurobiology
- detection, prediction and control of epileptic seizures
- embedded information systems
- nonlinear and stochastic brain dynamics
- sleep research, classification of sleep stages
- soft computing (fuzzy systems, neural networks, genetic algorithms, chaotic systems, hybrid intelligent systems)

Grants (participant):

- RET-05/2004, OMFB-01426/2004, Hungarian Molecular Biology and Info-bionics in Medical Research Grant, 2005.09.01.- 2006.08.31.
- OTKA NI 61101, Multidisciplinary Information Technology Grant, 01.09.2006.- 31.12.2008.
- BIAL Foundation (Portugal, No. 154/06), High-frequency oscillations and rhythmic slow activity during virtual navigation, REM sleep and wake-sleep transitions: Studies on intracranial recordings in humans, 2007-2009
- ONR Award No.: Grant N00014-07-1-0350, 2009

Teaching:

- Brain - Modeling - Infobionics (*Ballasi Institute*)
- Theory and calculus of circuits (*Pázmány Péter Catholic University, Faculty of Information Technology*)
- Digital signal processing (*Pázmány Péter Catholic University, Faculty of Information Technology*)
- Electrophysiological measures and prosthesis I (*Pázmány Péter Catholic University, Faculty of Information Technology*)
- Internet media communication (*Pázmány Péter Catholic University, Faculty of Information Technology*)
- Nonlinear dynamical systems (*Pázmány Péter Catholic University, Faculty of Information Technology*)
- Supervision of M.Sc. theses (*Pázmány Péter Catholic University, Faculty of Information Technology and Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics*)

Awards, scholarships:

- Scholarship granted by the Hungarian Republic, 1998-2005
- Student Scientific Competition 2nd prize, Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics in collaboration with the KFKI Research Institute for Particle and Nuclear Physics of the Hungarian Academy of Sciences, Department of Biophysics, Computational Neuroscience Group and the National Institute of Psychiatry and Neurology, Epilepsy Centre, 2004
- Erasmus Scholarship, Johann Wolfgang Goethe University, Institute of Applied Physics, Frankfurt, Germany, 01.04.2007.-31.08.2007.
- Student Paper Competition 2nd prize, 19th International Conference BIOSIGNAL, Brno, Czech Republic, 2008
- Travel bursary award, International League Against Epilepsy, 8th European Congress on Epileptology, Berlin, Germany, 2008

Skills and qualifications:

- Operating systems: Linux, Windows
- Office applications: Microsoft Office, OpenOffice, Internet, SVN
- Programming: Assembly, Basic, C/C++, Pascal, Matlab, VHDL, HTML, PHP, MySQL
- Statistical programs: R, STATISTICA
- Languages: fluent Hungarian and Serbian, advanced English, intermediate Croatian, basic German
- Other: A and B category driving licence

Society memberships:

- Hungarian Neuroscience Society
- IEEE, Engineering in Medicine and Biology Society
- John von Neumann Computer Society

Presentations, publications:

2010 B. Weiss, Z. Clemens, R. Bódizs, and P. Halász, "Comparison of fractal and power spectral EEG features: effects of topography and sleep stages," submitted.

B. Weiss, Z. Clemens, R. Bódizs, and P. Halász, "Gender-related differences of fractal and power spectral EEG features in young adults: effects of topography and sleep stages," submitted.

B. Weiss, Z. Clemens, R. Bódizs, and P. Halász, "A comparison of classification methods for sleep staging by combination of fractal and power spectral features of EEG signals recorded at different topographic locations," submitted.

2009 B. Weiss, Z. Clemens, R. Bódizs, P. Halász, T. Roska, "Topographic distribution of temporal self-similarity properties of human sleep EEG recordings," presented at 12th Meeting of the Hungarian Neuroscience Society, Budapest, Hungary, 2009.

Abstract published in *Frontiers in Systems Neuroscience*, doi: 10.3389/conf.neuro.01.2009.04.228

B. Weiss, I. Ulbert, L. Erőss, "Fractal properties of epileptic local field potentials recorded from different layers of the frontal cortex using a chronically implanted laminar microelectrode in humans," in *Proceedings of the 4th International IEEE EMBS Conference on Neural Engineering*, Antalya, Turkey, 2009, pp. 498-501.

B. Weiss, Y. C. Tang, F. R. Tang, "Fractal properties of epileptic field potentials recorded from the CA1 area of the hippocampus in the mouse model of temporal lobe epilepsy," presented at 28th International Epilepsy Congress, Budapest, Hungary, 2009.

Abstract to be published in *Epilepsia*.

- Z. Clemens, B. Weiss, A. Szűcs, L. Erőss, G. Rásonyi, P. Halász, "Phase coupling between rhythmic slow activity and gamma characterizes mesiotemporal rapid-eye-movement sleep in humans," in *Neuroscience*, vol. 163 (1), pp. 388-396, 2009. doi:10.1016/j.neuroscience.2009.06.044
- B. Weiss, Z. Clemens, R. Bódizs, Z. Vágó, P. Halász, "Spatio-temporal analysis of monofractal and multifractal properties of the human sleep EEG," in *Journal of Neuroscience Methods*, vol. 185 (1), pp. 116-124, 2009. doi:10.1016/j.jneumeth.2009.07.027
- 2008 B. Weiss, B. Hegedűs, Z. Vágó, T. Roska, "Fractal spectra of intracranial electroencephalograms in different types of epilepsy," in *19th International Conference BIOSIGNAL*, Brno, Czech Republic, 2008, ID 115, pp. 1-5.
- B. Weiss, Z. Vágó, R. Tetzlaff, P. Halász, T. Roska, "Comparison of self-similar properties of epileptic seizures of mesiotemporal/hippocampal and neocortical origin," presented at 8th European Congress on Epileptology, Berlin, Germany, 2008.
Abstract published in *Epilepsia*, vol. 50 (Suppl. 4), p. 187, 2009, doi: 10.1111/j.1528-1167.2009.02063.x
- B. Weiss, Z. Vágó, R. Tetzlaff, T. Roska, "Long-range dependence of long-term continuous intracranial electroencephalograms for detection and prediction of epileptic seizures," in *International Symposium on Nonlinear Theory and its Applications*, Budapest, Hungary, 2008, pp. 704-707.
- L. Gerencsér, C. Mathias, Z. Vágó, B. Torma, B. Weiss, "Self-exciting point processes with applications in finance and medicine," in *18th International Symposium on Mathematical Theory of Networks and Systems*, Blacksburg, Virginia, 2008.
- 2007 B. Weiss, Z. Vágó, T. Roska, "Epileptic seizure prediction and detection based on Hurst parameter estimation," presented at IX Workshop on Neurobiology of Epilepsy, Langkawi, Malaysia, 2007.
Workshop report: Marco de Curtis, Yoshiya Murashima, Raman Sankar, "9th Workshop on the Neurobiology of Epilepsy (WONOE IX): The transition from the interictal to the ictal state (Teluk Nibong, Langkawi Island, Malaysia, July 4-7, 2007)" in *Epilepsia*, vol. 49 (8), pp. 1475-1479, 2008.
- B. Weiss, Z. Vágó, R. Tetzlaff, T. Roska, "Long-range dependence of epileptic seizures," presented at 3rd International Workshop on Seizure Prediction in Epilepsy, Freiburg, Germany, 2007.
- 2006 B. Weiss, "A roham predikció módszerei," presented at XXIII. Epileptológiai Továbbképző Tanfolyam és Munkakonferencia, Győr, Hungary, 2006.