Tomasz Spustek

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Education

2011 2016	PhD studies – Physics, Biomedical Physics Division, University of Warsaw *Study of the dynamics of the bioelectrical activity of the brain by means of blind source separation methods*
2005 2011	M. Sc. Studies – Physics, Biomedical Physics Division, University of Warsaw *Detection of weak bioelectrical signals by means of Matching Pursuit algorithm based on L1 norm*

Career summary

08.2016 now	RESEARCH AND DEVELOPMENT SPECIALIST – Medicalgorithmics S.A. - ECG signal analysis, - signal classification by means of Machine Learning methods, - development of new products, - functionality updates for existing products, - cooperation with software developers.
10.2011 06.2016	LECTURER – ZFB, Physics Department, University of Warsaw Educational work: - classes in programming, signal analysis, physics and electrodynamics, - preparation of teaching materials, - conducting tests and exams. Scientific work: - EEG signal analysis, - signal analysis in Matlab environment, - software development in Python, - development and application of blind source separation methods, - advanced data analysis in the time-frequency domain, - research projects in international cooperation, - prepare technical documentation for created software.
11.2014 12.2015	LINUX SYSTEM ENGINEER – ZFB, Physics Department, University of Warsaw - monitor system availability and performance (Zabbix), - resolve hardware issues with servers and workstations, - tune and troubleshoot Linux servers and workstations (Debian),

- deploy services using virtualization environment (LXC),
- troubleshoot and resolve problems with other systems administrators,
- ensure the smooth operation of the acquisition and data storage systems,
- provide help for students and co-workers regarding scientific experiments,
- technical care of the internet subnetwork – http://zfb.fuw.edu.pl,
- creation and management of a website – http://brain.zfb.fuw.edu.pl (Wordpress),
- management of the online service with teaching materials – http://brain.fuw.edu.pl/edu (Mediawiki).

IT projects

2014

Collection of programs for the presentation of stimuli

[http://spustek.pl/software-projects/stimulation-software]

- creation of a core engine for stimulators in Python (event driven programming),
- design of graphical user interfaces,
- implementation of the saving results and configurations module,
- preparation of scientific publications.

2013

Implementation of the Matching Pursuit algorithm in Python and Matlab

[http://spustek.pl/software-projects/matching-pursuit]

- Matching Pursuit algorithm implementation along with the code optimization,
- integration of the program code with the EEGLAB toolbox for Matlab,
- preparation of unit tests for Python code,
- program additional functionalities, allowing visualization of results,
- design a graphical user interface for both programs,
- preparation of scientific publications and conference materials.

2012

Implementation of a simple eyetracker in Python using OpenCV library

[http://eyetracker-ng.org]

- creation of a mathematical model responsible for the operation of the device,
- model implementation in Python,
- design of a graphical user interface and diagnostic interfaces,
- preparation of a technical documentation for the project.

Research projects

2013 - 2016

Universal properties of steady-state Evoked Potentials in different modalities

- perform tests of the experimental system and report issues,
- acquisition of data,
- software development for processing and analyzing the resulting data,
- data analysis and interpretation by means of time-frequency methods and Independent Component Analysis.

2013 - 2015

Temporal and spectral aspects of auditory short-term memory in humans studied by means of MEG and EEG

- project carried out in collaboration with *Leibniz Institute for Neurobiology, Magdeburg DE,*

	- time – frequency analysis of a MEG signal, - study of the synchronization between different frequency bands.
2010 - 2013	Time – frequency analysis of the EEG during sleep, coma and in states of a minimal consciousness - project carried out in collaboration with *University Hospital, Liege BE*, - implementation of a Matching Pursuit based on L1 norm, - analysis of data from EEG+fMRI experiments in terms of identifying structures, - preparation of scientific publications and conference materials.

Scientific publications

2017	Imbir, K.K., Spustek, T., Duda J., Bernatowicz G., Żygierewicz, J. *N450 and LPC event-related potential correlates of an Emotional Stroop Task with words differing in valence and emotional origin. In press.*
2016	Imbir, K.K., Spustek, T., Żygierewicz, J. *Effects of valence and origin of emotions evidenced by ERP correlates in Lexical Decision Task: the emotion duality approach. Frontiers in Psychology 7, doi: 10.3389/fpsyg.2016.00271.*
2015	Imbir, K.K., Jarymowicz, M.T., Spustek, T., Kuś, R.,Żygierewicz, J. *Origin of Emotion Effects on ERP Correlates of Emotional Word Processing: The Emotion Duality Approach. PLoS ONE, 10(5), e0126129. doi:10.1371/journal.pone.012612.*
2015	Spustek T., Jędrzejczak W. W., Blinowska K. J. (2015). *Matching Pursuit with Asymmetric Functions for Signal Decomposition and Parameterization*. PLoS ONE, 10(6): e0131007. doi:10.1371/journal.pone.0131007.
2012	Spustek, T., Kuś, R., Malinowska, U., Durka, P., J. (2012). *Detection of EEG spindles in signal recorded during EEG-fMRI coregistration by means of Matching Pursuit Algorithm based on L1 norm*. Proceedings of the 7th International Workshop on Biosignal Interpretation , vol. 1, p. 217-220.
2012	Durka, P., J., Kuś, R., Żygierewicz, J., Michalska, M., Milanowski, P., Łabęcki, M., Spustek, T., Laszuk, D., Duszyk, A., Kruszyński, M. (2012). *User-centered design of brain-computer interfaces:* *OpenBCI.pl and BCI Appliancess*. Bulletin of the Polish Academy of Sciences 60(3), 427-433.
2012	*Spustek, T. (2012). Modelowanie zachowania komórek nerwowych w kontekście prostych sieci neuronowych*, Polonia University Scientific Journal, vol. 5, str. 33-40.
2011	Durka, P., J., Duszyk, A., Kuś, R., Żygierewicz, J., Łabęcki, M., i Spustek, T. (2011). *How and why brain-computer interfaces spy on our intentions.* W: How Science Spies Nature on and How Technology Imitates Nature, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk.

Conference presentations

2014 Dortmund	Imbir, K., Żygierewicz, J., Spustek, T. *"ERP's correlates of Automatic and Reflective emotions related words processing".* Second Conference of European Society for Cognitive and Affective Neurosciences.
2013 Tuebingen	Spustek, T., Żygierewicz, J. (2013). *Decomposition of multitrial multichannel event related potentials*. Bernstein Conference.
2012 Munich	Spustek, T., Kuś, R., Malinowska, U., Durka, P., J. (2012). *Matching Pursuit Algorithm based on L1 norm.* Neuroinformatics.
2012 Munich	Laszuk, D., Spustek, T., Rybusiński, J., Durka, P., J. (2012). *Low-costs eyetrackers as assistive devices.* Neuroinformatics.

2012 **Munich**	Spustek, T., Kruszyński, M., Laszuk, D., Milanowski, P., Łabęcki, M., Augustin, K., Duszyk, A., Kuś, R., Żygierewicz, J., Durka, P., J. (2012). *BCI Appliance.* Neuroinformatics.
2012 **Barcelona**	Duszyk, A.,E., Bierzyńska, M., Radzikowska, Z., Milanowski, P., Spustek, T., Łabęcki, M., Michalska, M., Durka P., J., Suffczyński, P. *The dependence between topology of Steady State Visual Evoked Potentials and parametres of stimulus*. 8th FENS Forum of Neuroscience.
2012 **Como**	Spustek, T., Kuś, R., Malinowska, U., Durka, P., J. *Detection of EEG spindles in signals recorded during EEG-fMRI coregistration by means of Matching Pursuit Algorithm based on L1 norm.* 7th International Workshop on Biosignal Interpretation.
2011 **Gdańsk**	Durka, P., J., Duszyk, A., Kuś, R., Żygierewicz, J., Łabęcki, M., Spustek, T. *How and why brain-computer interfaces spy on our intentions*. How science spies on and technology imitates nature.

Additional training and courses

2013 **Zurich**	Advanced Scientific Programming in Python (G-node INCF summer school)
2007 **Warsaw**	Visual Studio .Net (Microsoft Certified Profesional)

Programming and computer skills:

- advanced knowledge of Python programming language along with all popular libraries,
- advanced knowledge of Matlab programming environment,
- thorough knowledge of Linux operating system,
- knowledge of the Bash - Unix shell account at the intermediate level,
- knowledge of the GIT version control system at the intermediate level,
- knowledge of C/C++ at the intermediate level,
- knowledge of C# at the intermediate level,
- knowledge of SQL at the primary level,
- knowledge of HTML5 along with CSS3 style sheets at the intermediate level,
- ability to create GUIs using the following libraries: QT, PySide, WxWidgets and .Net,
- basic knowledge of PHP syntax,
- basic knowledge of Zabbix - network monitoring system.

Foreign languages:

- English – advanced in speech and writing,
- German – intermediate in speech and writing.