Tomasz Spustek

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Selected projects

2016 - 2017

Medicalgorithmics S.A. | 4 people | data scientist

Automatic classification of arrhythmia based on ECG signals

- analysis of large data sets,
- application of machine learning methods for classification,
- feature engineering and classifiers optimization,
- qualitative and quantitative evaluation of systems and result visualizations.

2013 - 2017

University of Warsaw | NCN project | 8 people | data scientist

Universal properties of steady-state Evoked Potentials in different modalities

- preparation of an innovative system allowing scientific experiments of SSEPs,
- collaboration with engineers to design and implement the right equipment,
- creation of measurement software, enabling a full range of SSEP research,
- carry out tests and pilot studies,
- acquisition of data and data interpretation,
- preparation of technical documentation, technical reports and scientific publications.

2014 - 2016

University of Warsaw | NCN project | 6 people | data scientist | software engineer

Physiological correlates of emotional word processing: study on evoked potentials

- creation of a core engine for stimulators in Python (event driven programming),
- design of graphical user interfaces,
- carry out tests and pilot studies,
- preparation of technical documentation and scientific publications.

2013 - 2015

University of Warsaw | 3 people | software engineer

Implementation of Matching Pursuit algorithm in Python and Matlab

- Matching Pursuit algorithm implementation along with the code optimization,
- integration of the program code with the EEGLAB toolbox for the Matlab environment,
- 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

University of Warsaw | 4 people | software engineer

Implementation of a simple eyetracker device

- design and build of the device in collaboration with a team of technicians,
- creation of a mathematical model responsible for the operation of the device,
- model implementation in Python using the openCV library,
- design of a graphical user interface and diagnostic interfaces,
- preparation of a technical documentation for the project.

2010 - 2013

University Hospital in Liege, University of Warsaw | 8 people | data scientist

Time-frequency analysis of EEG during deep sleep, coma and states of minimal consciousness

- design of an innovative method of interference filtering based on the Matching Pursuit algorithm,
- analysis of EEG+fMRI co-registered data for identification of characteristic structures,
- data and results visualizations,
- preparation of scientific publications and conference materials.

Education

2012 – 2019	**PHD STUDIES** Biomedical Physics Division Physics Department University of Warsaw
2005 – 2011	**M. SC. STUDIES** Biomedical Physics Division Physics Department University of Warsaw

Skills and competences

Python [NumPy, SciPy, Pandas]	■■■■■
Python ML [scikit, torch]	■■■
Matlab / Octave	■■■■■
C / C++	■■
Linux	■■■■
Windows	■■■
GIT	■■■
SQL	■■■
Spark, pySpark	■■
GUI [QT, PySide, wxWidgets]	■■■■
Zabbix	■■■
Machine learning	■■■■
Big data	■■■
Statistics	■■■■
Mathematical analysis	■■■■■
Software engineering	■■■

Additional training and courses

2013 Zürich	Advanced Scientific Programming in Python
2007 Warsaw	Visual Studio .Net

Foreign languages

English – advanced in speech and writing

German – intermediate in speech and writing

Work experience

11.2017 – now **Quantitative researcher** Tradelink Holdings (Montec LLC)

- analysing futures and equities market data,
- building statistical and ML models for algorithmic trading,
- analysing existing models' performance - recommending changes and improvements.

08.2016 – 11.2017 **Research & Development specialist** Medicalgorithmics S.A.

- making recommendations based on the analysis of large data sets,
- development of prototype solutions to be used in future products,
- preparation of functional updates for existing products,
- collaboration with C# development team to ensure adequate quality of created software.

10.2011 – 06.2016 **Scientific and didactic employee** University of Warsaw, Physics Department

- conduct programming and research projects, including NCN projects,
- research projects in international cooperation,
- development and maintenance of software,
- preparation of project proposals along with work schedules and budgets,
- classes in programming, signal analysis, physics and electrodynamics,
- preparation of teaching materials.

11.2014 – 06.2015 **Linux system engineer** University of Warsaw, Physics Department

- monitor system availability and performance,
- ensure the smooth operation of the acquisition and data storage systems,
- tune and troubleshoot Linux servers and workstations in Biomedical Physics Laboratory,
- troubleshoot and resolve problems with other systems administrators,
- recommendations on upgrading computer hardware and software,
- 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),
- creation and management of the online service with teaching materials – http://brain.fuw.edu.pl/edu (mediawiki).

Selected scientific publications

2017 Kuś R. Spustek T. Zieleniewska M. Duszyk A. Rogowski P. Suffczyński P.
Integrated trimodal SSEP experimental setup for visual, auditory and tactile stimulation.
Journal of Neural Engineering, http://iopscience.iop.org/10.1088/1741-2552/aa836f.

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.
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.
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.