

Michael A. Repucci, Ph.D.

135 Garfield Pl. Apt. 2F, Brooklyn, NY 11215
(M) 718-288-4554
michael@repucci.org
<http://michael.repucci.org/>

EXPERIENCE

2009–now

Research Associate, Laboratory of Neuroinformatics, Weill Cornell Medical College, New York, NY.

- Develop and manage toolkit for information theoretic analysis of neural data (STAToolkit @ neuroanalysis.org). Repond to user support requests. Administer toolkit wiki.
- Assist with medical school education by running small-group conferences on (neuro)physiology as part of a course titled *Molecules, Genes, and Cells*.

Techniques: information theory, Ubuntu Linux, C/C++, Matlab, DokuWiki.

2008–2009

Scientific Programmer, State University of New York, College of Optometry, New York, NY.

- Developed Python and C++ code to support real-time 3D stereoscopic visual experiments on depth perception and motion parallax. Employed OpenGL-based virtual reality (VR) APIs to create flexible and extensible infrastructure for scientific visual stimuli. Developed complete Django-based web application to provide user-manageable lab website. Managed Apache server.

Techniques: Python, C++, Django, Apache, OpenGL, Vizard, VRJuggler, real-time programming, synchronized 3D stereo video.

2008–2009

Scientific Programmer, Dr. Jerome Swartz, The Swartz Foundation, New York, NY.

- Developed a Matlab GUI for use in human psychophysics research. Employed PsychToolbox to present visual stimuli and record subject reaction times.

Techniques: Matlab, GUI, PsychToolbox, OpenGL.

2006–2008

Statistical Analyst, New York Methodist Hospital, Brooklyn, NY.

- Coordinated medical research (as independent contractor) funded by Codman: retrospective study of neurosurgical patients treated for normal pressure hydrocephalus with ventriculo-peritoneal shunt. Performed population statistics on subject pool and regression analysis to uncover correlations between MRI features and clinical outcome measures.

Techniques: linear regression, Pearson correlation, statistical analysis, CT/MRI assessment, medical record review, hiring and personnel management, grant writing.

2005–2007

Quantitative Analyst, Weill Medical College of Cornell University, New York, NY.

- Developed trading strategy (as independent contractor) in high-frequency currency markets based on multivariate decomposition algorithm. Ran high-volume time-series analysis on minute-by-minute currency data from five major inter-traded markets (e.g., USD-JPY-EUR-GBP-AUD). Predicted currency fluctuations based on nonlinear signature and hidden linear relationships among currencies.

Techniques: high-frequency quantitative analysis, financial trading models, programming in C#, Matlab.

2004–2005

Post-Doctoral Associate, Dr. György Buzsáki, Rutgers University, Newark, NJ.

- Investigated cortico-hippocampal communication and memory consolidation. Established system for simultaneous two-photon laser scanning cortical fluoroscopy and hippocampal micro-electrode recording to probe neurons *in vivo* in mice. Performed Fourier analysis and pixel-based statistics on images and electrode recordings to recover cellular activity profile and examine correlations between fluoroscopic and electrical signals.

Techniques: two-photon laser scanning microscopy, small animal surgery, *in vivo* fluorescent labeling, Fourier analysis, linear regression.

1999–2004

Graduate Fellow, Dr. Jonathan D. Victor, Weill Graduate School of Cornell University, New York, NY.

- Characterized linear and nonlinear spatiotemporal dynamics of receptive fields in cat primary visual cortex (Ph.D. Thesis).

- Developed patented algorithm for decomposition of multivariate time series—analyzed dynamics in ictal EEG records.

Techniques: nonlinear systems analysis, computational modeling, physiological preparation and maintenance in acute animal studies, tetrode electrophysiology, programming in Matlab, Delphi, OpenGL API, Windows API.

EDUCATION

- 2004 **Ph.D., Neuroscience, Weill Graduate School of Cornell University, New York, NY.**
Supported by institutional Kirschstein-NRSA vision research training grant.
Courses included mathematical structures in neuroscience, mathematical aspects of neurophysiology, visual motion, integrative neuroscience, ion channels.
- 1998 **B.S., Chemistry, The College of William and Mary, Williamsburg, VA.**
Majored in chemistry, honors thesis in organic chemistry, concentration in psychology.
Graduated *cum laude*, Dean's List 5/7 semesters, GPA 3.6.

EXPERTISE

- Computers *Experienced:* Matlab, Delphi, C/C++, Subversion, Ubuntu Linux, Windows 2000/XP, MS Office.
Proficient: Python, Django, Win32 API, OpenGL, Apache, DokuWiki, (X)HTML, CSS.
Familiar: C#, Java, JavaScript, PHP, SQL, XML, Mac OS X.
- Mathematics *Experienced:* Information Theory, (Non)Linear Decomposition, Spectral Analysis, Multivariate Regression.
Proficient: Modeling, Curve Fitting, Probability, Statistics.
Familiar: Signal Processing, ODEs, PDEs.
- Languages English (native), German (fluent), French (proficient), Spanish (basic).

PUBLICATIONS

- Victor, J.D., Mechler, F., Repucci, M.A., Purpura, K.P., and Sharpee, T. (2006) Responses of V1 neurons to two-dimensional Hermite functions. *Journal of Neurophysiology*. 95:379-400.
- Wang, G., Zhou, P., Repucci, M.A., Golanov, E.V., and Reis, D.J. (2001) Specific actions of cyanide on membrane potential and voltage-gated ion currents in rostral ventrolateral medulla neurons in rat brainstem slices. *Neuroscience Letters*. 309(2):125-9.
- Repucci, M.A., Schiff, N.D., and Victor, J.D. (2001) General strategy for hierarchical decomposition of multivariate time series: Implications for temporal lobe seizures. *Annals of Biomedical Engineering*. 29(12):1135-49.

PERSONAL

I... cook, cycle, study Buddhism, read, travel, sing, attend contemporary music/dance/theatrical performances, visit modern art museums/galleries, am happily married, *et cetera*.