

# Michael A. Repucci, Ph.D.

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## EXPERIENCE

- 2008–now **Scientific Programmer, State University of New York, College of Optometry, New York, NY.**
- Developed Python, Matlab, and C++ code to support real-time 3D stereoscopic visual experiments on depth perception and motion parallax. Employed OpenGL and virtual reality (VR) APIs to create flexible and extensible infrastructure for scientific visual stimuli.
- Techniques:* Python, Matlab, and C++, OpenGL, Vizard, VRJuggler, real-time programming, synchronized 3D stereo video.
- 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 *Expert:* Matlab, Python, Delphi, Windows OS, MS Office.  
*Proficient:* C/C++/C#, PHP, JavaScript, Win32 API, OpenGL, (X)HTML, CSS, Linux OS.  
*Familiar:* Macintosh OS, Java, XML.
- Mathematics *Expert:* Linear/Nonlinear Decomposition, Spectral/Fourier Analysis, Multivariate Regression.  
*Proficient:* Modeling/Curve Fitting, Information Theory, Probability/Statistics.  
*Familiar:* Graph Theory, Group Theory, Topology.
- 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, do gymnastics, read, travel, sing, attend contemporary music/dance/theatrical performances, visit modern art museums/galleries, listen to Goa trance, am happily married, *et cetera*.