

CURRICULUM VITAE

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EDUCATION

- Ph.D. — Elec. Eng. and Comp. Sci.** **University of California, Merced** **2006-2012**
“Validation of Computational Approaches for Studying Disordered and Unfolded Protein Dynamics Using Polymer Models”
Directed by Dr. Shawn Newsam & Dr. Michael E. Colvin. Read by Dr. Miguel Á. Carreira-Perpiñán and Dr. Ajay Gopinathan. GPA—4.00
- M.S. — Computer Science** **Vanderbilt University** **2002-2004**
“Reinforcement Learning of Dimensional Attention for Categorization”
Directed by Dr. David Noelle. Read by Dr. Thomas Palmeri. GPA—3.96
- B. S. — Computer Science** **Middle Tennessee State University** **1998-2002**
Minors in mathematics and physics. Graduated magna cum laude. GPA—3.78

PUBLICATIONS

- Phillips, J. L., Harvey, S. P., and Gnanakaran, S. (in preparation). Hybrid experimental/simulation engineering of OPAA enhances nerve agent neutralization. *Enzyme and Microbial Engineering Technology*.
- Lopez-Bautista, C. A., Phillips, J. L., Berman, G. P., Sayre, R. T., and Gnanakaran, S. (in preparation). Capturing the CP29 conformational changes responsible for pH dependent non-photochemical quenching. *Scientific Reports*.
- Morton, S. P., Phillips, J. B., and Phillips, J. L. (submitted). Molecular basis of pH-dependent HIV gp120-CD4 interactions revealed. *Evolutionary Bioinformatics*.
- Morton, S. P., and Phillips, J. L. (in press). Sub-class differences of pH-dependent HIV GP120-CD4 interactions. *Proceedings of the 9th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*.
- Phillips, J. L., Colvin, M. E., and Newsam, S. (in press). Dimensionality estimation of protein dynamics using polymer models. *Proceedings of the 9th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*.
- Syzonenko, I., and Phillips, J. L. (in press). Hybrid spectral/subspace clustering of molecular dynamics simulations. *Proceedings of the 9th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics*.
- Jovanovich, M. P. and Phillips, J. L. (in-press). N-task learning: solving multiple or unknown numbers of reinforcement learning problems. *Proceedings of the 40th Annual Meeting of the Cognitive Science Society*, Madison, WI.
- Williams, A. S. and Phillips, J. L. (in-press). Multilayer context reasoning in a neurobiologically inspired working memory model for cognitive robots. *Proceedings of the 40th Annual Meeting of the Cognitive Science Society*, Madison, WI.

- Muller, R. T., Travers, T., Cha, H.-J., Phillips, J. L., Gnanakaran, S., and Pos, K. M. (2017). Switch loop flexibility affects substrate transport of the AcrB efflux pump. *Journal of Molecular Biology*, 429 (24), 3863-3874. DOI:10.1016/j.jmb.2017.09.018
- Morton, S. P., Phillips, J. B., and Phillips, J. L. (2017). High-throughput structural modeling of the HIV transmission bottleneck. In *Proceedings of the 2017 IEEE International Conference on Bioinformatics and Biomedicine Workshops (HPCB 2017)*, Kansas City, MO.
- Howton, J. and Phillips, J. L. (2017). Computational modeling of pH-dependent gp120-CD4 interactions in founder and chronic HIV strains. *Proceedings of the 8th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (CSBW 2017)*, 644-649. DOI:10.1145/3107411.3107506
- DuBois, G. M., and Phillips, J. L. (2017). Working memory concept encoding using holographic reduced representations. *Proceedings of the 28th Annual Modern Artificial Intelligence and Cognitive Science Conference*.
- Phillips, J. L., and Gnanakaran, S. (2015). A data-driven approach to modeling the tripartite structure of multidrug resistance efflux pumps. *Proteins: Struct., Funct., and Bioinform*, 83 (1), 46-65. DOI:10.1002/prot.24632
- Gottardo, R., Bailer, R. T., Korber, B T., Gnanakaran, S., Phillips, J., Shen, X., Tomaras, G. D., Turk, E., Imholte, G., Eckler, L., Wenschuh, H., Zerweck, J., Greene, K., Gao, H., Berman, P. W., Francis, D., Sinangil, F., Lee, C., Nitayaphan, S., Rerks-Ngarm, S., Kaewkungwal, J., Pitisuttithum, P., Tartaglia, J., Robb, M. L., Michael, N. L., Kim, J. H., Zolla-Pazner, S., Haynes, B. F., Mascola, J. R., Self, S., Gilbert, P., Montefiori, D. C. (2013). Plasma IgG to linear epitopes in the V2 and V3 regions of HIV-1 gp120 correlate with a reduced risk of infection in the RV144 vaccine efficacy trial. *PLoS One*, 8(9):e75665.
- Stieh, D., Phillips, J. L., Rogers, P. M., King, D. F., Cianci, G. C., Jeffs, S. A., Gnanakaran, S., and Shattock, R. J. (2013). Dynamic electrophoretic fingerprinting of the HIV-1 envelope glycoprotein. *Retrovirology*, 10 (33).
- Phillips, J. L., Colvin, M. E., and Newsam, S. (2011). Validating clustering of molecular dynamics simulations using polymer models. *BMC Bioinformatics*, 12 (1), 445.
- Yamada, J., Phillips, J. L., Patel, S., Goldfien, G., Calestagne-Morelli, A., Huang, H., Reza, R., Acheson, J., Krishnan, V. V., Newsam, S., Gopinathan, A., Lau, E. Y., Colvin, M. E., Uversky V. N., and Rexach M. F. (2010). A bimodal distribution of two distinct categories of intrinsically-disordered structures with separate functions in FG nucleoporins. *Molecular and Cellular Proteomics*, 9, 2205-2224.
- Lau, E. Y., Phillips, J. L., and Colvin, M. E. (2009). Molecular dynamics simulations of highly charged green fluorescent proteins. *Molecular Physics: An International Journal at the Interface Between Chemistry and Physics*, 107 (8), 1233-1241.
- Phillips, J. L., Colvin, M. E., Lau, E. Y., and Newsam, S. (2008). Analyzing dynamical simulations of intrinsically disordered proteins using spectral clustering. In *Proceedings of the 2008 IEEE International Conference on Bioinformatics and Biomedicine Workshops (WCSB)*, Philadelphia, PA.
- Tugcu, M., Wang, X., Hunter, J. E., Phillips, J., Noelle, D., and Wilkes, D. M. (2007). A computational neuroscience model of working memory with application to robot perceptual learning. In *Proceedings of the 3rd International Conference on Computational Intelligence*, Banff, Alberta, Canada.
- Phillips, J. L., and Noelle, D. C. (2006). Working memory for robots: inspirations from computational neuroscience. In *Proceedings of the 5th International Conference on Development and Learning*, Bloomington, IN.
- Phillips, J. L., and Noelle, D. C. (2005). A biologically inspired working memory framework for robots. In *Proceedings of the 14th IEEE International Workshop on Robot and Human Interactive Communication*, Nashville, TN.
- Phillips, J. L., and Noelle, D. C. (2005). A biologically inspired working memory framework for robots. In *Proceedings of the 27th Annual Meeting of the Cognitive Science Society*, Stresa, Italy.

Phillips, J. L., Kogekar, S., and Adams, J. A. (2004). Emergency automated response system (EARS). In *Proceedings of the 48th Annual Meeting of the Human Factors and Ergonomics Society*, New Orleans, LA.

Phillips, J. L., and Noelle, D. C. (2004). Reinforcement learning of dimensional attention for categorization. In *Proceedings of the 26th Annual Meeting of the Cognitive Science Society*, Chicago, IL.

FUNDED GRANTS

Ding, W. (PI), Leander, R. (coPI), Robertson, W. (coPI), and Phillips, J. L. (coPI), (02/01/2018-01/31/2022). Computational modeling and simulation in the applied sciences. (MTSU Grant Index Number TBD). *NSF REU*, \$232k.

Dong, Z. (PI), Oslund, E. (coPI), Pettey, C. (coPI), and Phillips, J. L. (coPI), (02/01/2018-01/31/2022). Computer science plus plus (CS++) (MTSU Grant Index Number TBD). *NSF S-STEM*, \$1M.

Otter, R. R. (PI), Carroll, H. D. (coPI), and Phillips, J. L. (coPI), (07/21/2016-12/01/2017). Optimization and accessibility of the ecoTTC database (MTSU Grant Index Number 537031). *ILSI Health and Environmental Sciences Institute*, \$26k.

POSTERS

Howton, J., and Phillips, J. L., (2017). Computational modeling of pH sensitivity in the critical HIV GP120-CD4 interaction. *61st Annual Meeting of the Biophysical Society*, New Orleans, LA.

Phillips, J. L., Ganguly, K., Wren, M., Gupta, G., McMahon, B. H., Wall, M. E., and Gnanakaran, S. (2014). Systems level study of bacterial multi-drug resistance efflux machinery. *58th Annual Meeting of the Biophysical Society*, San Francisco, CA.

Phillips, J. L., and Gnanakaran, S. (2013). An experimentally driven multiscale study of bacterial efflux machinery. *7th Annual Q-Bio Conference*, Santa Fe, NM.

Phillips, J. L., and Gnanakaran, S. (2013). Coarse-grained simulations of the MexAB-OprM multidrug resistance efflux pump. *57th Annual Meeting of the Biophysical Society*, Philadelphia, PA.

Phillips, J. L., Lau, E. Y., Colvin, M. E., and Newsam, S. (2012). Dimensionality estimation of disordered protein dynamics. *56th Annual Meeting of the Biophysical Society*, San Diego, CA.

Phillips, J. L., Lau, E. Y., Colvin, M. E., and Newsam, S. (2010). Dimensionality reduction reveals differences between disordered protein dynamics and early-stage protein folding dynamics. *24th Annual Symposium of the Protein Society*, San Diego, CA.

Phillips, J. L., Lau E. Y., Rexach, M., Newsam, S., and Colvin, M. E. (2010). Differences between unfolded and disordered protein dynamics. *1st Gordon Research Conference on Intrinsically Disordered Proteins*, Davidson, SC.

Phillips, J. L., Lau E. Y., Krishnan, V. V., Rexach, M., Newsam, S., and Colvin, M. E. (2010). Metric scaling for dimensionality reduction of disordered protein dynamics. *54th Annual Meeting of the Biophysical Society*, San Francisco, CA. **(2010 Student Research Achievement Award)**

Phillips, J. L., Manilay, J. O., and Colvin, M. E. (2010). Analytic parameter fitting in stochastic stem cell models. *54th Annual Meeting of the Biophysical Society*, San Francisco, CA.

Phillips, J. L., Lau E. Y., Krishnan, V. V., Rexach, M., Newsam, S., and Colvin, M. E. (2009). Dynamics analysis of unstructured FG-nucleoporins. *23rd Annual Symposium of the Protein Society*, Boston, MA. **(2009 Best Student Poster Award)**

Phillips, J. L., Lau E. Y., Krishnan, V. V., Rexach, M., Newsam, S., and Colvin, M. E. (2008). Characterizing intrinsically disordered FG-nucleoporins using molecular dynamics. *22nd Annual Symposium of the Protein Society*, San Diego, CA.

INVITED TALKS

- Morton, S. P., Phillips, J. B., and Phillips, J. L. (Nov 13, 2017). High-throughput structural modeling of the HIV transmission bottleneck. *2017 IEEE International Conference on Bioinformatics and Biomedicine Workshops (HPCB 2017)*, Kansas City, MO.
- Howton, J. and Phillips, J. L. (Aug 20, 2017). Computational modeling of pH-dependent gp120-CD4 interactions in founder and chronic HIV strains. *8th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (WCSB 2017)*, Boston, MA.
- DuBois, G. M. and Phillips, J. L. (April 28, 2017). Working memory concept encoding using holographic reduced representations. *28th Modern Artificial Intelligence and Cognitive Science Conference (MAICS 2017)*, Fort Wayne, IN.
- Phillips, J. L., and Gnanakaran, S. (March 20, 2015). All-atom modeling and geometric simulations of efflux pumps. *Los Alamos National Laboratory LDRD #20140121DR External Review*, Los Alamos, NM.
- Phillips, J. L., Harvey, S. P., and Gnanakaran, S. (March 19, 2014). Molecular dynamics simulations of organophosphorus acid anhydrase interactions with V-type organophosphate nerve agents. *247th American Chemical Society National Meeting and Symposium*, Dallas, TX.
- Phillips, J. L. (October 10, 2013). High-throughput electrostatic surface potential calculations of HIV envelope proteins. *Center for Nonlinear Studies, Los Alamos National Laboratory*, Los Alamos, NM.
- Phillips, J. L., Pos, K. M., and Gnanakaran, S. (April 4, 2013). Multidrug efflux at multiple scales. *Center for Nonlinear Studies, Los Alamos National Laboratory*, Los Alamos, NM.
- Phillips, J. L., Colvin, M. E., Gopinathan, A., and Newsam, S. (October 4, 2012). Polymer models for the validation of dimensionality estimation of disordered protein dynamics. *Center for Nonlinear Studies, Los Alamos National Laboratory*, Los Alamos, NM.
- Phillips, J. L. (July 12, 2012). Validation of computational approaches for studying disordered and unfolded protein dynamics using polymer models (dissertation defense). *School of Engineering, University of California, Merced, CA*.
- Phillips, J. L., Colvin, M. E., Gopinathan, A., and Newsam, S. (April 19, 2012). Validating quantitative analysis methods for molecular simulations using polymer models. *Computational Biology Research Group, Dept. of Comp. Sci., University of California, Davis, CA*.
- Phillips, J. L., Colvin, M. E., Gopinathan, A., and Newsam, S. (September 7, 2011). Machine learning approaches for characterizing disordered protein dynamics. *Center for Nonlinear Studies, Los Alamos National Laboratory*, Los Alamos, NM.
- Phillips, J. L., Lau E. Y., Newsam, S., and Colvin, M. E. (March 7, 2011). Probing the conformation landscape of the unfolded state: do disordered and unfolded dynamics differ? *55th Annual Meeting of the Biophysical Society*, Baltimore, MD.
- Phillips, J. L. (September 3, 2010). Computational approaches for quantifying disorder in biopolymers. *Electrical Engineering and Computer Science Seminar Series, University of California, Merced, CA*.
- Phillips, J. L., Newsam, S., Lau E. Y., and Colvin, M. E. (August 9, 2009). Analyzing dynamical simulations of intrinsically disordered proteins. *San Diego Supercomputer Center*, San Diego, CA.
- Phillips, J. L., Colvin, M. E., Lau E. Y., and Newsam, S. (May 21, 2009). Analyzing dynamical simulations of intrinsically disordered proteins. *Center for Molecular Biophysics, Oak Ridge National Laboratory*, Oak Ridge, TN.
- Phillips, J. L., Colvin, M. E., Lau E. Y., and Newsam, S. (November 03, 2008). Analyzing dynamical simulations of intrinsically disordered proteins using spectral clustering. *IEEE Bioinformatics and Biomedicine 2008 (WCSB 2008)*, Philadelphia, PA.

Phillips, J. L. (August, 10, 2008). Quantifying the dynamics of intrinsically disordered proteins. *Theoretical and Computational Biophysics Group, Beckman Institute, University of Illinois, Urbana-Champaign, IL.*

HONORS

- 2012 Nicholas C. Metropolis Postdoctoral Fellowship (Los Alamos National Laboratory)
- 2012 Outstanding Graduate Student Award in Comp. Sci. (University of California, Merced)
- 2012 Selected for St. Jude Children's Research Hospital's National Graduate Student Symposium
- 2010 University of California, Merced Graduate Research Council Travel Award
- 2010 Biophysical Society Student Research Achievement Award
- 2010 Pittsburgh Supercomputing Center National Resource for Biomedical Supercomputing Award (Co-PI)
- 2009 Protein Society Best Student Poster Award
- 1998 Middle Tennessee State University Presidential Scholarship
- 1998 Square-D Computer Science Scholarship
- 1998 Middle Tennessee State University Freshman Computer Science Award

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery
Cognitive Science Society

SERVICE

- 2018 NSF Grant Review Panelist
- 2017 Reviewer for ACM Southeast
- 2015 Reviewer for Entropy
- 2014 Workshop Lecturer for the Eighth Annual Q-Bio Summer School
- 2013 Workshop Lecturer for the Seventh Annual Q-Bio Summer School
- 2013 Poster Judge for Los Alamos Summer Student Symposium
- 2011 Ad-hoc Reviewer for Journal of Biomolecular Structure and Dynamics
- 2010-2012 UC Merced Graduate Student Association Secretary
- 2009 Reviewer for Computational Structural Biology Workshop (IEEE BIBM)
- 2008-2009 Lecturer, UC Merced Center for Computational Biology, Undergraduate Research and Mentoring Program
- 2008 Reviewer for 2009 IEEE RO-MAN

PROFESSIONAL EXPERIENCE

Assistant Professor *Middle Tennessee State University* **2014-**
Develop and deliver course instruction for graduate and undergraduate courses. Conduct research both independently and collaboratively.

N. C. Metropolis Postdoctoral Fellow *Los Alamos National Laboratory* **2012-2014**
Conducted research both independently and in collaboration with laboratory staff.

Teaching Assistant *University of California, Merced* **2010**
Developed and delivered lecture materials focused on developing upper-division computational skills for biomolecular simulation. Oversaw computer labs and provided student support. Graded all relevant lab reports and tests.

Lecturer *University of California, Merced* **2007**
Presented lower-division computer science course material. Developed test and quiz materials. Assisted students with homework assignments and concepts related to the course.

Research Assistant *University of California, Merced* **2006-2012**
Conducted research both independently and in collaboration with faculty, graduate students, and undergraduate students. Submitted and presented work for publication in peer-reviewed conference proceedings and journals.

Research Assistant *Vanderbilt University* **2003-2006**
Conducted research both independently and in collaboration with faculty, graduate students, and undergraduate students. Submitted and presented work for publication in peer-reviewed conference proceedings.

Teaching Assistant

Vanderbilt University

2002

Assisted students with homework assignments and concepts related to their computer science courses. Oversaw computer lab and provided student support. Coordinated with other assistants to fulfill students' needs and university goals.

Web Programmer/Designer

Middle Tennessee State University

2001-2002

Developed web interface for online computer science laboratory manuals. Developed web programs to gather usage statistics.