Curriculum Vitae
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PAUL V. STODGHILL

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EDUCATION

Aug. 1997	**Ph.D.** Computer Science. Cornell University. Thesis Title: *A Relational Approach to the Automatic Generation of Sequential Sparse Matrix Codes*.
May 1992	**M.S.** Computer Science. Cornell University.
May 1988	**B.A.** Mathematics and Computer Science. Dickinson College. Magna Cum Laude. Phi Beta Kappa. Pi Mu Epsilon.

PROFESSIONAL EXPERIENCE

Robert W. Holley Center for Agriculture and Health, USDA-ARS, Ithaca, NY.

Aug. 2006 - present	Computational Physical Scientist
Oct. 2017 - April 2018;	Acting and Permanent Research Leader
Sep. 2016 - Oct. 2016;	(Plant-Microbe Interactions RU, Biological Integrated Pest
May 2011 - July 2015	Management RU, Emerging Pests and Pathogens RU)

Department of Computer Science, Cornell University.

Jan. 2005 - Aug. 2006	Senior Research Associate
July 1998 - Dec. 2004	Research Associate
May 1997 - June 1998	Postdoctoral Research Associate

PROFESSIONAL INTERESTS

- Using high-throughput technologies and bioinformatics to develop and refine genomes and genome annotations of phytopathogenic bacteria.
- Using high-throughput technologies and bioinformatics to study the interaction of phytopathogenic bacteria and their hosts.
- Using high-throughput methods and bioinformatics to unravel bacterial gene regulation.
- Developing computational methods for comparing thousands of bacterial genomes in order to discovery conserved genomic features.

- Developing and/or deploying software tools for high-performance computational biology.
- Developing and/or deploying software tools for enabling non-experts to visualize and manipulate genome-scale biological datasets.
- Analyzing, developing, and implementing information technology policy in a research environment.

REFEREED PUBLICATIONS

- Maxwell R. Fishman, Johnson Zhang, Philip A. Bronstein, Paul Stodghill, and Melanie J. Filiatrault. Ca2+-induced two-component system cvssr regulates the type iii secretion system and the extracytoplasmic function sigma factor algu in pseudomonas syringae pv. tomato dc3000. *Journal of Bacteriology*, 200(5):e00538–17, Dec 2017.
- B. Butcher, Z. Bao, J. Wilson, P. Stodghill, B.M. Swingle, M.J. Filiatrault, D.J. Schneider, and S.W. Cartinhour. The ECF sigma factor, PSPTO_1043, in *Pseudomonas syringae* pv. *tomato* DC3000 is induced by oxidative stress and regulates genes involved in oxidative stress response. *PLoS One*, 12(7):e0180340, 2017.
- E.J. Markel, P. Stodghill, Z. Bao, C. Myers, and B.M Swingle. Algu controls expression of virulence genes in *Pseudomonas syringae* pv. *tomato* DC3000. *Journal of Bacteriology*, 198(17):2330–2344, 2016.
- H. Wei, S. Chakravarthy, J. Mathieu, T.C. Helmann, P. Stodghill, B.M. Swingle, G.B. Martin, and A. Collmer. *Pseudomonas syringae* pv. *tomato* DC3000 type iii secretion effector polymutants reveal an interplay between hopAD1 and AvrPtoB. *Cell Host and Microbe*, 17(6):752–62, 2015.
- Lam, H.N., Chakravarthy, S., Wei, H., Buinguyen, H., Stodghill, P., Swingle, B.M., Collmer, A., Cartinhour, S.W. 2014. "Global analysis of the HrpL regulon in the plant pathogen *Pseudomonas syringae* pv. *tomato* DC3000 reveals new regulon members with diverse functions." *PLoS Pathogens*. 9(8):e106115.
- Park, S., Bao, Z., Butcher, B., D'Amico, K.M., Xu, Y., Stodghill, P., Schneider, D.J., Cartinhour, S.W., Filiatrault, M.J. 2014. "Analysis of the small RNA *spf* in the plant pathogen *Pseudomonas syringae* pv. *tomato* strain DC3000." *Microbiology*. 160(Pt 5):941-953.
- Swingle, B.M., Bao, Z., Stodghill, P., Myers, C.R., Lam, H., Markel, E.J., Collmer, A., Cartinhour, S.W., Schweitzer, P. 2014. "Genomic plasticity enables phenotypic variation of *Pseudomonas syringae* pv. *tomato* DC3000." *Molecular Microbiology*. 9(2):e86628.
- Filiatrault, M.J., Stodghill, P., Wilson, J.M., Butcher, B.G., Chen, H., Meyers, C.R., Cartinhour, S.W. 2013. "CrcZ and CrcX regulate carbon utilization in *Pseudomonas syringae* pathovar *tomato* strain DC3000." *RNA Biology.* 10(2):243-253.
- Swingle, B.M., Markel, E.J., Butcher, B.G., Myers, C.R., Stodghill, P., Cartinhour, S.W. 2013. "Regulons of the *Pseudomonas syringae* pv. *tomato* DC3000 iron starvation sigma factors *PSPTO_0444*, *PSPTO_1209* and *PSPTO_1286*." *Applied and Environmental Microbiology.* 79(2):725-727.
- Filiatrault MJ, Stodghill PV, Myers CR, Bronstein PA, Butcher BG, Lam H, Grills G, Schweitzer P, Wang W, Schneider DJ, Cartinhour SW. "Genome-wide identification of transcriptional

start sites in the plant pathogen *Pseudomonas syringae* pv. *tomato* str. DC3000." *PLoS One*. 6(12):e29335. 2011.

- Markel E, Maciak C, Butcher BG, Myers CR, Stodghill P, Bao Z, Cartinhour S, Swingle B. "An extracytoplasmic function sigma factor-mediated cell surface signaling system in *Pseudomonas syringae* pv. *tomato* DC3000 regulates gene expression in response to heterologous siderophores." *J Bacteriol.* 193(20):5775-83. 2011.
- Butcher BG, Bronstein PA, Myers CR, Stodghill PV, Bolton JJ, Markel EJ, Filiatrault MJ, Swingle B, Gaballa A, Helmann JD, Schneider DJ, Cartinhour SW. "Characterization of the Fur regulon in *Pseudomonas syringae* pv. *tomato* DC3000." *J Bacteriol.* 193(18):4598-611. 2011.
- Moll S, Schneider DJ, Stodghill P, Myers CR, Cartinhour SW, Filiatrault MJ. "Construction of an rsmX co-variance model and identification of five rsmX non-coding RNAs in *Pseudomonas syringae* pv. *tomato* DC3000." *RNA Biol.* 7(5):508-16. 2010.
- Filiatrault MJ, Stodghill PV, Bronstein PA, Moll S, Lindeberg M, Grills G, Schweitzer P, Wang W, Schroth GP, Luo S, Khrebtukova I, Yang Y, Thannhauser T, Butcher BG, Cartinhour S, Schneider DJ. "Transcriptome analysis of *Pseudomonas syringae* identifies new genes, noncoding RNAs, and antisense activity." *J Bacteriol.* 192(9):2359-72. 2010.
- Greg Bronevetsky, Keshav Pingali, Paul Stodghill. "Experimental evaluation of application-level checkpointing for OpenMP programs." *International Conference on Supercomputing (ICS)*. July, 2006.
- Keshav Pingali, Paul Stodghill. "A distributed system based on web services for computational science simulations." *International Conference on Supercomputing (ICS)*. July, 2006.
- Greg Bronevetsky, Rohit Fernandes, Daniel Marques, Keshav Pingali, Paul Stodghill. "Recent advances in checkpoint/recovery systems." *International Parallel and Distributed Processing Symposium (IPDPS)*. April, 2006.
- Rohit Fernandes, Keshav Pingali, and Paul Stodghill. "Mobile MPI Programs in Computational Grids." *ACM 2006 Symposium on Principles and Practice of Parallel Programming.* March 29-31, 2006. New York, NY.
- Kamen Yotov, Sandra Jackson, Tyler Steele, Keshav Pingali, and Paul Stodghill. "Automatic Measurement of Instruction Cache Capacity." *The 18th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2005).* October 20-22, 2005. Hawthorne, New York.
- Kamen Yotov, Keshav Pingali, and Paul Stodghill. "X-Ray: automatic measurement of hardware parameters." *The International Conference on Quantitative Evaluation of SysTems (QEST) 2005.* September 19-22, 2005. Torino, Italy.
- Kamen Yotov, Keshav Pingali, and Paul Stodghill. "Think Globally, Search Locally." *ICS 2005.* June 20-22, 2005, Boston, MA, USA
- Kamen Yotov, Keshav Pingali, and Paul Stodghill. "Automatic Measurement of Memory Hierarchy Parameters." *International Conference on Measurement & Modeling of Computer Systems (SIGMETRICS).* June 6, 2005.

- K. Yotov, X. Li, G. Ren, M. Garzarán, D. Padua, K. Pingali, P. Stodghill. "Is Search Really Necessary to Generate High-Performance BLAS?" *Proceedings of the IEEE*, vol. 93, no. 2, February 2005, pg 358–386.
- Martin Schulz, Greg Bronevetsky, Rohit Fernandes, Daniel Marques, Keshav Pingali, Paul Stodghill. "Implementation and Evaluation of a Scalable Application-level Checkpoint-Recovery Scheme for MPI Programs." *Supercomputing 2004.* November, 2004.
- Greg Bronevetsky, Daniel Marques, Keshav Pingali, Paul Stodghill. "C3: A System for Automating Application-level Checkpointing of MPI Programs." *The 16th International Workshop on Languages and Compilers for Parallel Computers (LCPC'03).* October, 2003.
- Greg Bronevetsky, Daniel Marques, Keshav Pingali, Paul Stodghill. "Automated Application-level Checkpointing of MPI Programs." *Principles and Practices of Parallel Programming (PPOPP) 2003.* July, 2003.
- Kamen Yotov, Xiaoming Li, Gang Ren, Michael Cibulskis, Gerald DeJong, Maria Garzaran, David Padua, Keshav Pingali, Paul Stodghill, and Peng Wu. "A Comparison of Empirical and Model-driven Optimization." *Programming Languages Design and Implementation (PLDI) 2003.* July, 2003.
- Greg Bronevetsky, Daniel Marques, Keshav Pingali, Paul Stodghill. "Collective Operations in an Application-level Fault Tolerant MPI System." *International Conference on Supercomputing (ICS) 2003.* San Francisco, CA. June 23-26, 2003.
- Paul Chew, Nikos Chrisochoides, S. Gopalsamy, Gerd Heber, Tony Ingraffea, Edward Luke, Joaquim Neto, Keshav Pingali, Alan Shih, Bharat Soni, Paul Stodghill, David Thompson, Steve Vavasis, and Paul Wawrzynek. Computational science simulations based on web services. In *International Conference on Computational Science*, Melbourne, Australia and St. Petersburg, Russia, June 2–4 2003.
- Gerd Heber, David Lifka, and Paul Stodghill. "Post-Cluster Computing and the Next Generation of Scientific Applications." *Sixth World Multiconference on Systemics, Cybernetics and Informatics.* July, 2002.
- Kevin B. Theobald, Gagan Agrawal, Rishi Kumar, Gerd Heber, Guang R. Gao, Paul Stodghill, and Keshav Pingali. "Landing CG on EARTH: A Case Study of Fine-Grained Multithreading on an Evolutionary Path." *Supercomputing 2000.* Dallas, TX, November 4-11, 2000.
- Nawaaz Ahmed, Nikolay Mateev, Keshav Pingali, and Paul Stodghill. "A Framework for Sparse Matrix Code Synthesis from High-level Specifications." *Supercomputing 2000.* Dallas, TX, November 4-11, 2000.
- George Coulouris, Gerd Heber, David Lifka, Keshav Pingali , David Schneider, Paul Stodghill, Paul Wawrzynek, John Zollweg. "Parallel FEM Simulation of Crack Propagation on the AC3 Velocity Cluster." *The Second Workshop on Cluster Based Computing.* 2000.
- Bruce Carter, et al.. "Parallel FEM simulation of Crack Propagation - Challenges, Status, and Perspectives." *Irregular*. 2000.
- Nikolay Mateev, Keshav Pingali, Paul Stodghill, and Vladimir Kotlyar. "Next-generation Generic Programming and its Application to Sparse Matrix Computations." *International Conference on Supercomputing*. May, 2000.

- Vladimir Kotlyar, Keshav Pingali, Paul Stodghill. "A Relational Approach to the Compilation of Sparse Matrix Programs." *Euro-Par* August, 1997.
- Vladimir Kotlyar, Keshav Pingali, Paul Stodghill. "Compiling Parallel Sparse Code for User-Defined Data Structures." *SIAM Conference on Parallel Processing for Scientific Computing, PPSC 1997*. March, 1997.
- Vladimir Kotlyar, Keshav Pingali, Paul Stodghill. "Compiling Parallel Code for Sparse Matrix Applications." *Parallel Processing for Scientific Computing, PPSC 1997* November, 1997.
- Vladimir Kotlyar, Keshav Pingali, Paul Stodghill. "Automatic Parallelization of the Conjugate Gradient Algorithm" *Languages and Compilers for Parallel Computing (LCPC)*. August 1995. 480-499
- David Bau, Induprakas Kodukula, Vladimir Kotlyar, Keshav Pingali, Paul Stodghill "Solving Alignment Using Elementary Linear Algebra" *Languages and Compilers for Parallel Computing (LCPC)*. August, 1994.
- Keshav Pingali, Micah Beck, Richard Johnson, Mayan Moudgill, Paul Stodghill: Dependence Flow Graphs: An Algebraic Approach to Program Dependencies. *ACM Symposium on Principles of Programming Languages (POPL)*. January, 1991.

INVITED LECTURES

Nov. 2009	"IMHO: Some Thoughts on Bioinformatics Capabilities", Workshop on Animal Bioinformatics, sponsored by the EC-US Task force on Biotechnology. Cambridge, England.
Aug. 2009	"Integrating molecular and computational methods to evaluate the *Pseudomonas syringae* transcriptome." American Phytopathological Society Annual Meeting. Portland, Oregon. (with M. Filiatrault).
Apr. 2009	"Coping with Large Data-Sets in the era of Peta-scale Biology". Colloquium in the Department of Plant Pathology and Microbe Interaction Biology, Cornell University.
May 2008	Presentation to Antoinette Betschart, Associate Administrator for Research Operations and Management, ARS, on computational methods for computational analysis methods for high-throughput sequencing data.
Nov. 2007	Presentation to Under Secretary Gale Buchanan, Under Secretary for Research, Education and Economics, USDA, on issue of peta-scale computational biology within ARS.
Apr. 2006	"Recent Advances in Checkpoint/Recovery Systems." NSFNGS 2006 Workshop. Rhodes, Greece.
Apr. 2005	"Optimizing Checkpoint Sizes in the C^3 System." NSFNGS 2005 Workshop. Denver, Colorado.
Jan. 2005	"Wide Area Distributed Computing in the Adaptive Software Project (ASP)." Wide Area Distributed Computing at Cornell University Roundtable Workshop. Ithaca, NY.

Jun. 2004 "O'SOAP - A Web Services Framework for DDDAS Applications." Workshop on Dynamic Data-Driven Application Systems ICCS 2004. Krakow, Poland.

Dec. 2003 "Web Services for Distributed Simulation: The Adaptive Software Project." Argonne National Laboratory, Lemont, IL.

Oct. 2003 "C^3: A System for Automating Application-level Checkpointing of MPI Programs." International Workshop on Languages and Compilers for Parallel Computing (LCPC'03). College Station, Texas.

Jun. 2000 "Crack Propagation on Teraflop Computers (CPTC)." First Annual Meeting of the Advanced Cluster Computing Consoritum (AC3) - Roadmaps to the Future of Cluster Computing. Ithaca, NY.

May 2000 "Next-generation Generic Programming and its Application to Sparse Matrix Computations." International Conference on Supercomputing (ICS'00). Santa Fe, New Mexico. (with N.Mateev)

May 2000 "Parallel FEM Simulation of Crack Propagation on the AC^3 Velocity Cluster". Second Workshop on Cluster-Based Computing. Santa Fe, New Mexico.

Sep. 1999 "Implementations Issues of Krylov Space Iterative Solvers". University of Delaware.

Aug. 1995 "Automatic Parallelization of the Conjugate Gradient Algorithm." Languages and Compilers for Parallel Computing (LCPC), Columbus, Ohio, USA.

OTHER PROFESSIONAL ACTIVITIES AND SERVICE

- Courtesy Assistant Professor, Plant Pathology and Plant-Microbe Biology Section, Cornell University, 2017-present.
- Member, BRC Bio-IT/Bioinformatics faculty advisory committee, 2017-present.
- Member, Axon (ARS Intranet) Design Committee, 2012-2014. Received an "ARS Administrative Program Management Award (Communication Category)".
- Invited external reviewer, LRBAA proposals for DHS's OST. 2012-2013.
- Invited external reviewer, "Multiscale Epidemiologic/Economic. Simulation and Analysis (MESA)" project, sponsor by DHS and USDA-APHIS and performed by DOE-LLNL. 2009-2010.
- Program Committee, Technical Program, ACM's *Supercomputing 2007* conference, held in Reno, NV, November 10-16, 2007.
- Co-chair of the Working Group on Checkpoint and Recovery, Global Grid Forum. 2003 - 2004.
- Editor, "Use-cases for GridCPR", Working Group on Checkpoint and Recovery, Global Grid Forum. 2003 - 2004.
- Instructor or co-instructor for CS612, "Software Design for High-performance Architectures." Department of Computer Science, Cornell University. Spring, 2001 - 2003.
- Co-instructor for CS717, "Programming for Fault-tolerance." Department of Computer Science, Cornell University. Fall 2001.
- Instructor for CS107, "An Introduction to Scheme." Department of Computer Science, Cornell University. Spring 1991, Spring 1994.
- Member of Association for Computing Machinery (ACM), 1991-present.