

# Aaron Vose

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## HPC Software Engineer

Talented software engineer possessing comprehensive expertise in developing and optimizing software to achieve maximum scalability and performance in High Performance Computing (HPC) environments.

## Work Experience



**Cray Inc.** — Software Engineer,  
for Performance Tools Sr. Manager Heidi Poxon.  
July 2015 – present.  
Research and engineering for the FastForward2, DesignForward2, and PathForward projects.  
Research and development in ML / DL / AI, specializing in NN hyperparameter optimization.



**Cray Inc.** — Software Engineer,  
for Performance Team Director Mike Aamodt.  
July 2013 – July 2015.  
Assists domain scientists with code optimization for world-class HPC resources.



**University of Tennessee** — Graduate Teaching Assistant,  
for Dr. Bradley T. Vander Zanden and Dr. Micah Beck.  
August 2012 – July 2013.  
Assisted teaching “Databases & Scripting Languages” and “Operating Systems”.



**Joint Institute for Computational Science** — Research Associate,  
for Dr. Igor B. Jouline.  
August 2010 – January 2012.  
Wrote HPC code scaling molecular docking software Dock6 to thousands of cores.



**National Institute for Computational Science** — Intern,  
for Dr. Bhanu Rekepalli.  
May 2010 – August 2010.  
Wrote HPC code to scale NCBI’s blastall software to 98,000 cores.



**University of Tennessee** — Research Assistant,  
for Distinguished Professor Dr. Sergey Gavrilets.  
2002 – July 2012.  
Completed numerous research projects, many of which resulted in publication.

## Academic History



M.S., Computer Science, Summer 2013.  
B.S., Computer Science, Spring 2010.  
University of Tennessee, Knoxville.



CCDA - Cisco Certified Design Associate, 2001.  
CCNA - Cisco Certified Network Associate, 2000.

## Highlighted Skills

Strong command of the C programming language.  
Languages: C, C++, Fortran, PHP, Java, Bash, Perl, Python, Assembly (SSE/AVX/ARM).  
Tools: CCE, GCC, GDB, L<sup>A</sup>T<sub>E</sub>X, PAPI, CrayPAT, Oprofile, PBS, SLURM, Neural Networks.  
APIs: MPI, OpenACC, OpenMP, OpenGL, pthreads, POSIX, CUDA, WebGL.

## Books

John Levesque and Aaron Vose, (2017) “Programming for Hybrid Multi/Manycore MPP Systems”. *Chapman and Hall / CRC*. Computational Science Series, ISBN 9781439873717, Taylor & Francis.

## Journal, Conference, and Chapter Publications

Aaron Vose, Jacob Balma, Alex Heye, Alessandro Rigazzi, Charles Siegel, Diana Moise, Benjamin Robbins, and Rangan Sukumar (2019) “Recombination of Artificial Neural Networks”. *arXiv.org* 1901.03900

Steve Farrell, Aaron Vose, Oliver Evans, Matthew Henderson, Shreyas Cholia, Fernando Perez, Wahid Bhimji, Shane Canon, Rollin Thomas, and Prabhat (2018) “Interactive Distributed Deep Learning with Jupyter Notebooks”. *International Conference on High Performance Computing* (pp. 678-687) Springer, Cham.

Otten, M., Gong, J., Mametjanov, A., Vose, A., Levesque, J., Fischer, P. and Min, M. (2016) “An MPI/OpenACC implementation of a high-order electromagnetics solver with GPUDirect communication”. *International Journal of High Performance Computing Applications*.

Kjaergaard, T., Baudin, P., Bykov, D., Eriksen, J.J., Ethenhuber, P., Kristensen, K., Larkin, J., Liakh, D., Pawlowski, F., Vose, A., and Wang, Y.M. (2016) “Massively parallel and linear-scaling algorithm for second-order Moller-Plesset perturbation theory applied to the study of supramolecular wires”. *Computer Physics Communications*.

M. Norman, J. Larkin, A. Vose, and K. Evans (2015) “A case study of CUDA FORTRAN and OpenACC for an atmospheric climate kernel”. *Journal of Computational Science*. Vol 9: 1-6.

A. Vose, B. Mitchell, J. Levesque (2014) “Tri-Hybrid Computational Fluid Dynamics on DoE’s Cray XK7, Titan”. 2014 *Cray User Group* (CUG).

Birand, A., A. Vose, and S. Gavrillets (2012) “Patterns of species ranges, speciation, and extinction”. *American Naturalist*. Vol 179.

B. Rekepalli, A. Vose, and P. Giblock (2012) “HSPp-BLAST: Highly Scalable Parallel PSI-BLAST for Very Large-scale Sequence Searches”. *Bioinformatics and Computational Biology* (BICoB-2012), ISCA 4th Int’l. Conference 2012, Las Vegas, Nevada.

L. D. Crosby, R. G. Brook, B. Rekepalli, M. Sekachev, A. Vose, and K. Wong (2011) “A Pragmatic Approach to Improving the Large-scale Parallel I/O Performance of Scientific Applications”. 2011 *Cray User Group* (CUG).

E. A. Duenez-Guzman, A. D. Vose, M. D. Vose, and S. Gavrillets (2009) “Simulating Population Genetics on the XT5”. 2009 *Cray User Group* (CUG).

Gavrillets, S. and A. Vose (2009) “Dynamic patterns of adaptive radiation: evolution of mating preferences”. In Butlin, RK, J Bridle, and D Schluter (eds) *Speciation and Patterns of Diversity*, Cambridge University Press, pp. 102-126.

Gavrillets, S. and A. Vose (2007) “Case studies and mathematical models of ecological speciation. 2. Palms on an oceanic island”. *Molecular Ecology* 16: 2910-2921

Gavrillets, S., A. Vose, M. Barluenga, W. Salzburger, and A. Meyer (2007) “Case studies and mathematical models of ecological speciation. 1. Cichlids in a crater lake”. *Molecular Ecology* 16: 2893-2909

Gavrillets, S. and A. Vose (2006) “The dynamics of Machiavellian intelligence”. *Proceedings of the National Academy of Sciences USA* 103: 16823-16828

Gavrillets, S. and A. Vose (2005) “Dynamic patterns of adaptive radiation”. *Proceedings of the National Academy of Sciences USA* 102: 18040-18045

## Presentations

Vose, A. “Porting Computational Physics Applications to the Titan Supercomputer with OpenACC and OpenMP”, *GPU Technology Conference* (GTC), San Jose, California, 2015.

Rekepalli, B.; Vose, A. “Petascale Genomic Sequence Search.” *Proceedings of The 11th IEEE/ACM International Symposium on Cluster, Cloud, and Grid Computing*, Newport Beach, California, May 2011.

Vose, A. “Modeling Speciation in Anolis Lizards”, *South Eastern Population Ecology and Evolutionary Genetics Conference* (SEPEEG), Cades Cove, Tennessee, 2007.