

PETER A. YOON

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EDUCATION

- Ph. D. in Computer Science, The Pennsylvania State University, University Park, PA, 1995.
- M.S. in Mathematics, Purdue University, West Lafayette, IN, 1989.
- B.S. in Computer Science, North Carolina State University, Raleigh, NC, 1986.
- B.S. in Mathematics, North Carolina State University, Raleigh, NC, 1986.

PROFESSIONAL EXPERIENCE

- Chair, Department of Computer Science, Trinity College, Hartford, CT, 2020–2022.
- Fulbright U.S. Scholar, Jimma Institute of Technology, Jimma University, Jimma, Ethiopia, 2018–2019.
- Professor, Department of Computer Science, Trinity College, Hartford, CT, 2016–Present.
- Chair, Department of Computer Science, Trinity College, Hartford, CT, 2009–2015.
- Associate Professor, Department of Computer Science, Trinity College, Hartford, CT, 2006–2015.
- Assistant Professor, Department of Computer Science, Trinity College, Hartford, CT, 2000–2006.
- Assistant Professor, Computer Science Department, Azusa Pacific University, Azusa, CA, 1995–2000.
- Research Assistant, Applied Research Laboratory, University Park, PA, 1991–1995.

RESEARCH

Areas of Interest

High-performance computing, scientific computing, and signal and image processing

Publications

- B. Imana and P. Yoon, “Computing extreme eigenvalues of general complex matrices on the GPU,” in *Proceedings of the 27th International Conference on Parallel & Distributed Processing Techniques & Applications*, Las Vegas, NV, July 2021.
- V.S. Maringanti, B. Imana, and P. Yoon. “GPU-accelerated VLSI routing using group Steiner trees,” *The Journal of Computational Science Education*, 8:16–19, 2017.
- L. Cheng, H. Cho, and P. Yoon. “An accelerated procedure for hypergraph coarsening on the GPU,” in *Proceedings of the 19th IEEE High Performance Extreme Computing Conference*, pp. 1–7, Boston, MA, September 2015.
- B. Imana and P. Yoon. “A scalable parallel bisection algorithm for symmetric tridiagonal eigenvalue problem,” in *Proceedings of the 21st International Conference on Parallel and Distributed Processing Techniques and Applications*, pp. 618–624, Las Vegas, NV, July 2015.
- P. Bhandari, R. Chandrashekhar, and P. Yoon. “Shuffled frog leaping algorithm for 0/1 knapsack problem on the GPU,” in *Proceedings of the 13th International Conference on Scientific Computing*, pp. 16–22, Las Vegas, NV, July 2015.
- H. Cho and P. Yoon. “A memory-efficient algorithm for large-scale symmetric tridiagonal eigenvalue problem on multi-GPU systems,” in *Proceedings of the 20th International Conference on Parallel and Distributed Processing Techniques and Applications*, pp. 568–573, Las Vegas, NV, July 2014.
- L. Cheng, H. Cho, and P. Yoon. “GPU accelerated vessel segmentation using Laplacian eigenmaps,” in *Proceedings of the 12th International Conference on Parallel and Distributed Computing and Networks*, pp. 177–184, Innsbruck, Austria, February 2014.

- L. Cheng, H. Cho, P. Yoon, and J. Zhao. “An efficient out-of-core implementation of block Cholesky decomposition on a multi-GPU system,” in *Proceedings of the 24th International Conference on Parallel and Distributed Computing and Systems*, pp. 1–7, Las Vegas, NV, November 2012.
- C.M. Coviello, L.H. Sibul, and P. Yoon. “Source separation and tracking for time varying systems,” *IEEE Transactions on Aerospace and Electronic Systems*, 44:1198–1214, 2008.
- H. Rushmeier, J. Dykes, J. Dill, and P. Yoon. “Revisiting the need for formal education in visualization,” *IEEE Computer Graphics and Applications*, 27:12–16, 2007.
- A. Williams and P. Yoon. “Content-based image retrieval using joint correlograms,” *Multimedia Tools and Applications*, 34:239–248, 2007.
- C.M. Coviello, L.H. Sibul, and P. Yoon. “A stable, adaptive method for joint blind source separation and angle estimation in a non-stationary environment,” in *Proceedings of the 39th Conference on Information Sciences and Systems*, Baltimore, MD, March 2005.
- C.M. Coviello, L.H. Sibul, and P. Yoon. “Multipath DOA tracking using complete orthogonal decompositions,” in *Proceedings of the 38th Conference on Information Sciences and Systems*, pp. 1481–1486, Princeton, NJ, March 2004.
- M. Emilio, A. Williams, and P. Yoon. “A path search algorithm for independent component analysis used in blind source separation,” in *Proceedings of the 18th International Congress of Acoustics*, pp. 325–326, Kyoto, Japan, April 2004.
- C.M. Coviello, L.H. Sibul, and P. Yoon. “Algebraic DOA estimation and tracking using ULV decomposition,” in *Proceedings of the International Conference on Neural Networks and Signal Processing*, pp. 1310–1313, Nanjing, China, December 2003.
- T. Ning and P. Yoon. “Independent component analysis of multichannel hippocampal EEG during REM sleep,” in *Proceedings of the 5th International Conference on Signal and Image Processing*, pp. 513–516, Honolulu, HI, August 2003.
- L.H. Sibul and P. Yoon. “An efficient preprocessor for nonlinear adaptive algorithms,” in *Proceedings of the 6th International Conference on Signal Processing*, pp. 1617–1620, Beijing, China, August 2002.
- L.H. Sibul and P. Yoon. “An efficient array processor for accurate downdating of ULV decomposition,” in *Proceedings of SPIE Advanced Signal Processing Algorithms, Architectures, and Implementations XI*, pp. 262–272, San Diego, CA July 2001.
- J.L. Barlow and P. Yoon. “An efficient rank detection procedure for modifying the ULV decomposition,” *BIT*, 38:781–801, 1998.
- J.L. Barlow and P. Yoon. “Solving recursive TLS problems using the rank-revealing ULV decomposition,” in *Recent Advances in Total Least Squares Techniques and Error-in-Variables Modeling*, S. Van Huffel, editor, pp. 117–126, SIAM, Philadelphia, PA, 1997.
- J.L. Barlow and P. Yoon. “Modifying the singular value decomposition on the Connection Machine,” *International Journal of High Speed Computing*, 8:145–170, 1996.
- J.L. Barlow, P. Yoon and H. Zha. “An algorithm and a stability theory for downdating the ULV decomposition,” *BIT*, 36:14–40, 1996.
- J.L. Barlow, H. Zha, and P. Yoon. “Stable chasing algorithms for modifying complete and partial singular value decompositions,” in *Proceedings of SPIE Advanced Signal Processing Algorithms, Architectures, and Implementations IV*, pp. 455–466, San Diego, CA, July 1993.

Grants and Awards

- Research Expense Grant. “Analysis of Transient Signals Using Generalized Eigensystems on Accelerated Processors,” Trinity College, 2020.
- Fulbright U.S. Scholar Award, 2018-2019. “High-Performance Computing for All,” Jimma University, Jimma, Ethiopia.
- Regional Travel Grant. Public Affairs Section, The United States Embassy, Addis Ababa, Ethiopia, 2018.
- Student Research Assistant Grants. “Jacobi-like method for symmetric-definite generalized eigenvalue problem on the GPUs,” Trinity College, 2017.

- CUDA Education Center, Nvidia Research, 2015.
- Student Research Assistant Grants. “An accelerated approach to eigenvalue computation using the Faddeev-Laverrier Algorithm,” Trinity College, 2016.
- Student Research Assistant Grants. “Group Steiner Problem on a hybrid multiprocessor,” Trinity College, 2015.
- Blue Waters Student Internship Program. “VLSI routing and estimation,” Shodor, 2015.
- Student Research Assistant Grants. “GPU-based Jacobi, divide and conquer, and bisection algorithms for the symmetric eigenvalue problem,” Trinity College, 2014.
- Best Paper Award. “An efficient out-of-core implementation of block Cholesky decomposition on a multi-GPU system,” The 24th International Conference on Parallel and Distributed Computing and Systems, Las Vegas, NV, November, 2012.
- Student Research Assistant Grants. “A GPU-based Laplacian eigenmap generation for image segmentation” and “Arbitrary precision integer multiplication on a multi-GPU system,” Trinity College, 2012.
- CUDA Teaching Center, Nvidia Research, 2012.
- Student Research Assistant Grants. “A fast parallel algorithm for symmetric positive definite systems” and “Verification of Collatz-type conjectures on the GPUs,” Trinity College, 2011.
- Faculty Research Grant. “Interactive visualization of large-scale time-varying data,” Trinity College, 2011.
- Student Research Assistant Grant. “Numerical solution of the secular equation on GPU,” Trinity College, 2010.
- Faculty Development Grant, Trinity College, 2006.
- NASA EPSCoR Core Funding Grant. “An efficient dimensionality reduction technique for content-based image retrieval,” 2006.

Presentations

- “Computing Extreme Eigenvalues of General Complex Matrices on the GPU,” The 27th International Conference on Parallel & Distributed Processing Techniques & Applications, Las Vegas, NV, July 2021.
- “High-Performance Computing for Cybersecurity,” An invited talk at the 3rd International Conference on the Internet, Cyber Security and Information Systems, Gaborone, Botswana, November 2018.
- “High-Performance Computing for Creative Arts,” An invited talk at Limkokwing University of Creative Technology, Gaborone, Botswana, November 2018.
- “High-Performance Computing Without Breaking Your Wallet: An HPC Experience at a Small College,” An invited talk at Botho University, Gaborone, Botswana, November 2018.
- “Engaging Undergraduate Students in High-Performance Computing Research,” An invited talk at University of Botswana, Gaborone, Botswana, November 2018.
- “Studying Computer Science in the U.S.,” An invited talk at Walk in My Shoes Speaker Series hosted by EducationUSA at Public Affairs Section, U.S. Embassy, Gaborone, Botswana, November 2018.
- “Extreme Computing: Introducing XSEDE,” Summer Science Research Program, Trinity College, July 2014.
- “GPU accelerated vessel segmentation using Laplacian eigenmaps,” The 12th International Conference on Parallel and Distributed Computing and Networks, Innsbruck, Austria, February 2014.
- “Cheap Computing: Using GPUs for scientific applications,” Faculty Research Committee Lecture, Trinity College, April 2012.
- “Content-based image retrieval using joint correlograms,” The 8th Joint Conference on Information Sciences, Salt Lake City, UT, July 2005.
- “Independent component analysis of multichannel hippocampal EEG during REM sleep,” The 5th International Conference on Signal and Image Processing, Honolulu, HI, August 2003.
- “An efficient preprocessor for nonlinear adaptive algorithms,” The 6th International Conference on Signal Processing, Beijing, China, August 2002.

- “Current Trends in Supercomputing,” Trinity Center for Collaborative Teaching & Research (TCCTR) Newer Faculty Brown Bag Lunch Series, Trinity College, April 2002.
- “An efficient array processor for accurate downdating of ULV decomposition,” The SPIE’s 46th Annual Meeting, San Diego, CA, July 2001.
- “Modifying the singular value decomposition on the Connection Machine,” The 7th SIAM Conference on Parallel Processing for Scientific Computing, San Francisco, CA, February 1995.
- “Stable chasing algorithms for modifying complete and partial singular value decompositions,” The SPIE’s 38th Annual Meeting, San Diego, CA, July 1994.
- “Stable chasing algorithms for modifying complete and partial singular value decompositions,” An invited talk at the 5th SIAM Conference on Applied Linear Algebra, Snowbird, UT, June 1994.

Professional Affiliations

- Member, Association for Computing Machinery (ACM)
- Member, Institute of Electrical and Electronics Engineers (IEEE)

TEACHING

Courses Taught

- CPSC 110-05 Interactive Computer Graphics
- CPSC 110-07 Visual Computing
- CPSC 114 Introduction to Internet Computing
- CPSC 115L Introduction to Computing
- CPSC 203 Mathematical Foundations of Computing
- CPSC 215L Data Structures and Algorithms
- CPSC 275L Introduction to Computer Systems
- CPSC 230 Machine Organization and Assembly Language
- CPSC 304 Computer Graphics
- CPSC 315 Systems Software
- CPSC 316 Foundations of Programming Languages
- CPSC 333 Computer Network
- CPSC 371 Compiler Theory and Construction
- CPSC 375 High-Performance Computing
- CPSC 403/404 Computer Science Seminar
- FYFO 101 First-Year Seminar

Courses Developed

- CPSC 110-07 Visual Computing, 2012.
- CPSC 275L Introduction to Computer Systems, 2011.
- CPSC 110-05 Interactive Computer Graphics, 2008.
- CPSC 375 High-Performance Computing, 2001.

Projects/Theses Supervised

- Christian Autor, “NumisList,” 2022.
- Aadiv Sheth, “Nørd,” 2022.
- Julian Mastroianni, “Virtual Business Card,” 2022.
- Alisa Levin and Rahul Mitra, “A Real-Time Object Detection Aid for the Visually Impaired,” 2021.
- Hunter Moore, Wayne Sassano, and Tyler Somerville, “Persistent Virtual Graffiti” 2021.
- Ted Tierney, “TrinTrade,” 2021.
- Prabhat Bhootra, “A Web App for Comparable Companies Analysis,” 2020.
- Weishuang Gao, “Free Financial Data Analysis Platform,” 2020.
- Ali Hasan, “Digital Audio Signal Processor,” 2020.
- Seb Kryspin, “Job Hunter: A 3D Platformer Game About Getting a Job,” 2020.

- Edward Li, “Echo,” 2020.
- Kalsang Sherpa, “Personalized Application for Hotel Mulberry,” 2020.
- Ilya Ilyankou, “Dimensionality Reduction Techniques and Their Use in Data Visualization,” 2018.
- Francis Maugeri, “Economics the Interactive Experience,” 2018.
- Isabella Dahilig, “K.E.A Trainer,” 2018.
- Yinghuan Wang, “Game of Pong AI,” 2018.
- Bemnet Demere, “Accelerating Block-Tridiagonal Matrix Inversion on the GPUs,” 2018.
- Stephen DeMonico. “Coincide: Digital data acquisition of multi-particle events,” 2017.
- Courtney Driscoll. “What’s your tougue saying: Development of a mobile app for tougue image storage and a desktop GUI to extract a diagnosis from an image of a tougue,” 2017.
- Harrison Quarls. “Literacy teaching assistant,” 2017.
- Minghui Liu, “J3DGE: An education 3D game engine written in Java,” 2017.
- Peter Jung. “Aesthetic feature extraction and an emotion guessing machine,” 2017.
- Rahul Chandrashekhar. “An analysis of political social media data using natural language processing,” 2017.
- Pranav Bhandari. “Local-E: Connecting you back to your community,” 2017.
- George Thekkedath. “T-Mart,” 2016.
- Igwe Igwe-Kalu. “GenRelate,” 2016.
- Reid Delaney. “Ball Don’t Lie,” 2016.
- Luke Bradford-Winkler. “Covert command and control (C2) channel,” 2016.
- Hyunsu Cho. “Image classification using hypergraphs on the GPU,” 2015.
- Dragan Levic. “Mobile cross platform Erlang C calculator,” 2014.
- Gong Chen. “Option pricing on the GPU,” 2012.
- Dimitar Gochev. “Solving convex-hull problems on the GPU,” 2011.
- Paul Mertens. “Grammar-aware English-Latin machine translation,” 2010.
- Keith van Stolk-Riley. “Musical assistant composition application,” 2010.
- Kalin Gochev. “Parallel ray-tracing algorithm with advanced lighting effect,” 2009.
- Brian Sinnott. “Online chemistry testing system,” 2008.
- Todd Klasik. “User interface for interactive computer graphics,” 2008.
- Michael Sollami. “Starfile retrieval system,” 2007.
- Andy Molina. “Steganography: the art of information hiding,” 2006.
- Scott Troost. “Virtual stage,” 2005.
- Adam Williams. “Content-based image search engines,” 2004.
- Bryan Dion. “Building high-performance computing systems,” 2002.
- Jonathan Kinsman. “E-commerce functionality for small business,” 2002.
- Cabral Thomas. “Voice integration with the Web,” 2002.
- Oliver Page. “A restaurant server Palm Pilot menu,” 2001.
- Nate Jones. “Solving total least squares problem in parallel,” Azusa Pacific University, 1999.
- Kenneth Van Train. “Insight – a clinic information system,” Master’s Thesis, Azusa Pacific University, 1996.

SERVICE

TO THE DEPARTMENT

- Department Chair, 2020–2022.
- Computer Science and Engineering Administrative Assistant Search Committee, 2022.
- Admissions Liaison, 2017–Present.
- Acting Department Chair, Fall 2020.
- Acting Department Chair, Fall 2015.
- Department Chair, 2009–2015.
- Computing Center Department Liaison, 2001–Present.
- Coach, Trinity College ACM programming teams, 2004.
- Co-organizer, Connecticut-Trinity-Wesleyan Joint Colloquium Series, 2005.

TO THE COLLEGE COMMUNITY

- Registrar Search Committee, 2021.
- Appointments and Promotions Committee, 2019–20.
- Advisor, June Days, 2013-2015.
- Campus Champion, XSEDE, 2014–Present.
- Judge, Hartford Science Fair, 2014-2015.
- Engineering Department Faculty Search Committee, 2014-2015.
- Coordinator, CUDA Education Center, 2012–Present.
- Faculty Advisor, Remnants at Trinity College, 2009–Present.
- Faculty Research Committee, 2008–2010.
- Information Technology in Education Committee, 2005–2008, 2015–2018.
- Individualized Degree Program Council, 2005–2007.
- Advisory Committee on Fraternities and Sororities, 2001–2004.

TO PROFESSIONAL COMMUNITY

- Programming Committee, The 17th International Conference on Algorithms and Architectures for Parallel Processing, Helsinki, Finland, August 2017.
- Programming Committee, The First International Workshop on GPU Computing and Applications, Hiroshima, Japan, November 2016.
- Review Committee, Grace Hopper Celebration of Women in Computing Scholarship, 2015.
- Reviewer, Journal of Consortium for Computing Sciences in Colleges, 2012-2013.
- Session Chair, The 12th International Conference on Parallel and Distributed Computing and Networks, Innsbruck, Austria, February, 2014.
- Session Chair, The 24th International Conference on Parallel and Distributed Computing and Systems, Las Vegas, NV, November, 2012.
- Session Chair, The 8th Joint Conference on Information Sciences, Salt Lake City, UT, July 2005.
- Session Chair, The 39th Conference on Information Sciences and Systems, Baltimore, MD, March 2005.
- Session Chair, The 18th International Congress of Acoustics, Kyoto, Japan, April 2004.
- Session Chair, The 5th International Conference on Signal and Image Processing, Honolulu, HI, August 2003.