Matthew J. Sottile

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1867 Fircrest Dr.
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Department of Computer and Information Science
University of Oregon
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Degrees

2006	Ph.D. in Computer Engineering, University of New Mexico
2001	M.S. in Computer Science, University of Oregon
1999	B.S. in Mathematics and Computer Science, University of Oregon

Thesis

Matthew J. Sottile, "A Measurement and Simulation Methodology for Parallel Computing Performance Studies". PhD Thesis, Department of Electrical and Computer Engineering, University of New Mexico, 2006. Advisor: Dr. David A. Bader

Matthew J. Sottile, "The Design Of A General Method For Constructing Coupled Scientific Simulations". Masters Thesis, Department of Computer and Information Science, University of Oregon, 2001. Advisor: Dr. Janice E. Cuny

Matthew J. Sottile, "A Framework for Building High Performance Computational Servers Using HPC++". Undergraduate Thesis, Department of Computer and Information Science, University of Oregon, 1999. Advisor: Dr. Allen D. Malony

Experience

Sept 2007 – present	Research Associate, Adjunct Assistant Professor at the University of Oregon Computer and Information Science Department
Sept 2006 – Sept 2007	Technical Staff Member at the Los Alamos National Laboratory Computational Physics Group (CCS-2)
June 2001 – Sept 2006	Technical Staff Member at the Los Alamos National Laboratory Advanced Computing Laboratory (CCS-1)
March 2000 – January 2001	Co-founder and lead software architect at Counterclaim.com, Eugene, Oregon
Sept 1999 – June 2001	Research Assistant at the University of Oregon
March 1999 – Sept 1999	Research Assistant at the Los Alamos National Laboratory Advanced Computing Laboratory
March 1997 – March 1999	Research Assistant at the University of Oregon
June 1996 – Sept 1998	Software Engineering Consultant at Blue Cross Blue Shield of Oregon
Sept 1994 – June 1996	Programmer at Infolab Technologies, Inc., Portland, Oregon
June 1994 – Sept 1994	Summer Intern at Portland State University

Honors and awards

2005 National Nuclear Security Administration, Defense Programs Award of Excellence. Verification and Validation techniques for the W76-1 Life Extension Program.
2004 Los Alamos National Laboratory LAAP Award for Clustermatic-based ASCI Lightning supercomputer
2004 R&D 100 Award as member of the LANL Cluster Research Team for the Clustermatic cluster software suite
2003 Los Alamos National Laboratory LAAP Award for work on 10T "Pink" Linux Cluster
2003 Los Alamos National Laboratory LAAP Award for work on Component Programming Models
2002 National Nuclear Security Administration, Defense Programs Award of Excellence Design and Implementation of the Clustermatic suite
2001 First place, University of Oregon Department of Computer Science programming contest
1999 Graduated with departmental honors, University of Oregon
1996 Undergraduate Physics award, University of Portland

Books and Book Chapters

M. Sottile, C. Rasmussen, T. Mattson (2009). "Introduction to Concurrency in Programming Languages", Chapman-Hall/CRC Press, ISBN 978-1420072136.

R. Bramley, R. Armstrong, L. McInnes, **M. Sottile** (2006) Chapter 14, "High-Performance Component Software Systems". In "Parallel Processing for Scientific Computing", eds. M. Heroux, P. Raghavan, and H. Simon. SIAM.

Papers Submitted

M. A. Abramson, T. J. Asaki, J. E. Dennis, R. Magallanez, and **M. J. Sottile** (2008). "Solving Computationally Expensive Optimization Problems with CPU Time-Correlated Functions". Submitted to Optimization Letters, Springer.

P. Cherepanov, T. J. Asaki, **M. Sottile**, and K. R. Vixie (2008). "Image Denoising by Regularization on Characteristic Graphs." Submitted to SIAM Journal on Imaging Sciences (SIIMS).

Peer-reviewed Conferences

G. Hulette, **M. Sottile**, A. Malony (2008). "WOOL: A Workflow Programming Language", Proceedings of eScience 2008.

A. Nataraj, A. Morris, A. D. Malony, **M. Sottile**, P. Beckman (2007). "The Ghost in the Machine: Observing the Effects of Kernel Operation on Parallel Application Performance." Proceedings of Supercomputing 2007, Reno, Nevada.

A. Nataraj, **M. Sottile**, A. Morris, A. Malony, and S. Shende (2007). "TAUoverSupermon: Low-Overhead Online Parallel Performance Monitoring." Proceedings of EuroPar 2007, Rennes, France.

M. Sottile, C. Rasmussen, and R. Graham (2006). "Co-Array Collectives: Refined Semantics for Co-Array Fortran.". In V. Alexandrov, D. van Albada, P. Sloot, and J. Dongarra, editors, International Conference on Computational Science (ICCS 2006), LNCS. Springer, 2006.

M. Sottile, V. Chandu, and D. Bader (2006). "Performance analysis of parallel programs via message-passing graph traversal.". Proceedings of IPDPS 2006, Rhodes Island, Greece.

K. Borozdin, et. al. (2005). "Cosmic-ray muon tomography and its application to the detection of high-Z materials" Proceedings of the 46th Annual Meeting for the Institute of Nuclear Materials Management, 2005.

C. Rasmussen, **M. Sottile**, C. Rickett (2005). "A Gentle Migration Path to Component-Based Programming" Proceedings of the International Conference on Parallel Computational Fluid Dynamics (PCFD) 2005, Washington, D.C.

K. Borozdin, et. al. (2004). "Information extraction from muon radiography data", in ISAS/CITSA 2004: International Conference on Cybernetics and Information Technologies, Systems and Applications and 10th International Conference on Information Systems Analysis and Synthesis, Vol 2, Proceedings: Communications, Information and Control Systems, Technologies and Applications, pp. 27–30, 2004.

M. J. Sottile and R. G Minnich (2004). "Analysis of microbenchmarks for performance tuning of clusters" Proceedings of Cluster 2004, San Diego, CA.

C. Rasmussen, **M. Sottile**, J. Nieplocha, R. Numrich, E. Jones (2004). "Co-Array Python: A Parallel Extension to the Python Language" Proceedings of EuroPar 2004, Pisa, Italy.

S. Choi, E. Hendriks, R. Minnich, **M. Sottile**, G. Watson (2004). "Pink: A 1024-node Single-System Image Linux Cluster", HPC Asia 2004, Myrinet Users Group Workshop, Tokyo, Japan.

S. Shende, A. D. Malony, C. Rasmussen, **M. Sottile** (2003). "A Performance Interface for Component-Based Applications" Proc. International Workshop on Performance Modeling, Evaluation, and Optimization of Parallel and Distributed Systems, IPDPS'03, Nice, France.

M. J. Sottile and R. G Minnich (2002). "Supermon: A high-speed cluster monitoring system" Proceedings of Cluster 2002, Chicago, IL.

S. Choi, E. Hendriks, R. Minnich, **M. Sottile**, A. Marks (2002). "Life with Ed: A Case Study of a LinuxBIOS/BProc Cluster" 16th Annual International Symposium on High Performance Computing Systems and Applications, Moncton, NB, Canada.

M. Sottile and A. Malony (1999). "INTERLACE: An Interoperation and Linking Architecture for Computational Engines" Proceedings of EuroPar 99, Toulousse, France, pp.135-138.

A. Malony, J. Skidmore, and **M. Sottile** (1999). "Computational Experiments using Distributed Tools in a Web-based Electronic Notebook Environment" Proceedings of HPCN Europe '99, Amsterdam, The Netherlands.

J. L. Skidmore, **M. J. Sottile**, J. E. Cuny, and A. D. Malony (1998). "A Prototype Notebook-Based Environment for Computational Tools" Proceedings of Supercomputing '98, Orlando, FL.

Peer-reviewed Journals

C. D. Rickett, S-E. Choi, C. E Rasmussen, **M. J. Sottile** (2006). "Rapid Prototyping Frameworks for Developing Scientic Applications: A Case Study." Journal of Supercomputing, Vol. 36, Issue 2, pp. 123–134. Kluwer Academic Publishers.

R. Minnich, **M. Sottile**, S. Choi, E. Hendriks, and J. McKie (2006). "Right-Weight Kernels: an off-the-shelf alternative to custom Light-Weight Kernels." ACM SIGOPS Operating Systems Review, Vol. 40, Issue 2, pp. 22–28.

R. Armstrong, G. Kumfert, L. Curfman McInnes, S. Parker, B. Allan, **M. Sottile**, T. Epperly, T. Dahlgren (2006). "The CCA Component Model for High-Performance Scientific Computing" Concurrency and Computation: Practice and Experience, Vol. 18, Issue 2, pp. 215–229.

C. E. Rasmussen, **M. J. Sottile**, S. S. Shende, and A. D. Malony (2005). "Bridging the language gap in scientific computing: the Chasm approach", Concurrency and Computation: Practice and Experience, Vol. 18, Issue 2, pp. 151–162.

A. Malony, S. Shende, N. Trebon, J. Ray, R. Armstrong, C. Rasmussen, **M. Sottile** (2005). "Performance Technology for Parallel and Distributed Component Software", Concurrency and Computing: Practice and Experience, Vol. 17, Issue 2-4, pp. 117–141.

M. J. Sottile and R. G Minnich (2002). "Scale up your monitoring with Supermon" IEEE Task Force for Cluster Computing Newsletter, Fall 2002. Vol. 4, No. 1.

A. D. Malony, J. E. Cuny, J. L. Skidmore, **M. J. Sottile** (2000). "Computational experiments using distributed tools in a Web-based electronic notebook environment". Future Generation Computer Systems, Volume 16, Issue 5, March 2000.

Technical reports

S. DeSalvo, S. Ibrahim, J. Treanor, and **M. Sottile** (2007). "Image Processing for C. elegans Movement Video Streams." Los Alamos National Laboratory Technical Report No. LA-UR-07-5069.

Posters

G. Hulette, **M. Sottile**, R. Armstrong, and B. Allan (2008). "Using CCA and Onramp to Generate an Application-specific Framework from a Monolithic Application". Supercomputing 2008 Conference, Austin, TX.

S. Faumont, G. Rondeau, T. Thiele, **M. Sottile**, J. Zemek, and S. R. Lockery (2008). "Simultaneous recording of neuronal activity and behavior in freely crawling worms". Neuronal Development, Synaptic Function and Behavior, C. elegans Topic Meeting No. 2. June 2008, University of Wisconsin-Madison.

C. Rasmussen, **M. Sottile**, D. Quinlan, W. Weseloh. "Fortran+- (extensions and restrictions): Is it time for a new parallel language? Not entirely." DOE ASCR PI meeting, Denver, CO., March 31, 2008.

T. Asaki and **M. Sottile**. "DEEPBLUE: A component-based software toolkit for image and shape metrics". LANL CCS Division Review Poster Session, June 1, 2005.

Funding

Proposal under review: Principal Investigator: Fortran Transformational Tools in Support of Scientific Application Development for Petascale Computer Architectures, Department of Energy Office of Science. **Total award sought: $436,000**. Period: January 2009 through December 2011.

Principal Investigator: Image segmentation for High Resolution Microscopic Slide Images, Placental Analytics LLC. **Total award: $38,159**. Period: June, 2008 through June, 2009.

Principal Investigator: Center for Technology for Advanced Scientific Component Software (TASCS), Computational Science Research and Partnerships Division, Department of Energy Office of Science. **Total award: $360,000**. Period: June 1, 2008 through May 31, 2012.

Project Leader: LANL Computer and Computational Science Division Image Metrics Project, DOE/NNSA ASC Verification and Validation Program. **Total budget: $800,000**. Period: September 2006 through September 2007 (Departed LANL September 2007).

Academic activities

PhD DRP Committee Member, Shangkar Mayanglambam.

PhD Committee, Kyle Hanson (Chemistry Dept.). External Member.

Research project supervisor, Andrew Isaacson. Implementation of the Spatial Fuzzy-C Means Image Segmentation Algorithm on General Purpose Graphics Processing Units.

Course taught, Fall 2008, University of Oregon. CIS 630 Distributed Systems.

Graduate research supervisor, Kristy Thomas. Image processing and quantitative analysis of acute inflammation in histology slides of the human placenta.

Graduate research supervisor, Geoffrey Hulette. CCA source analysis tools for automatic component generation from legacy codes.

PhD DRP Committee Member, Geoffrey Hulette (Spring 2008).

Course designed and taught, Spring 2008, University of Oregon. CIS 410/510 Computational Data Science.

Problem contributor for 2007/08 CIS Department Programming Competition, "Phonetic Matching" problem.

Course designed and taught, Winter 2008, University of Oregon. CIS 610 Multicore Systems.

Undergraduate student research supervisor, Kristy Thomas. Project: Fourier Analysis of multichannel EEG signal data. (Winter, Spring 2008)

Invited Participant, August 2007 Intel Multicore Programming Training for academic program development.

Mentor for 2007 LANL DDMA Data Sciences Summer School, students Jennifer Treanor, Sharif Ibrahim, Stephen DeSalvo. Project: Image and video processing of C. elegans motion for behavior analysis and neural model verification. Data provided by and work performed in collaboration with Dr. Shawn Lockery, University of Oregon, Department of Biology.

Tutorial designed and taught, Summer 2007, Los Alamos National Laboratory. Introduction to Image Processing.

Mentor for LANL summer students Vaddadi Chandu (UNM/GA Tech), John Seiffertt (UMN), and Benjamin Cook (UCLA), Summer 2005.

Professional activities

Program committee member, 14th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS), held in conjunction with IPDPS '09, Rome, Italy, May 2009.

Program committee member, 11th IEEE International Conference on High Performance Computing and Communications (HPCC-09), Seoul, Korea, June 2009.

Reviewer for Supercomputing 2008 conference.

Program committee member, First International Conference on Contemporary Computing, August 7-9, 2008, NOIDA, India.

Program committee member, 10th IEEE International Conference on High Performance Computing and Communications (HPCC-08), Dalain, China, September 25–27, 2008.

Program committee member, 9th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC) at IPDPS 2008.

Industry mentor for 2007 UCLA IPAM Research in Industrial Projects for Students (RIPS) program. Project title : "Cooperation Among Autonomous Robots and Occlusion Video Tracking". Team : Boris Hanin, Konrad Krawczyk, Diane Panagiotopolous, S. Yusef Shafi.

Proposal review committee member for 2007 LANL LDRD-DR "Information Science and Technology" subject area.

Core program participant at UCLA IPAM 2007 "Random Shapes" program, "Random and Dynamic Graphs and Networks" and "Image Processing for Random Shapes" workshops.

Program committee member for Performance Evaluation and Measurement topic area for HPCC 2007, Houston, TX.

Project leader for LANL CCS, HPC, and T division ASC image metrics project. Managed a team of 6 researchers for image-based metrics applied to radiographic data acquired via the LANL Dual Axis Radiographic Hydrodynamic Test facility (DARHT) for verification and validation problems in the ASC Science and Simulation based Nuclear Weapons Stockpile Stewardship program.

Industry mentor for 2006 UCLA IPAM Research in Industrial Projects for Students (RIPS) program. Project title : "Robotic Path Planning and Visibility with Limited Sensor Data". Team : David Galkowski, Christine Lee, Gitendra Malla, Jennifer Treanor.

Program committee member for the 2nd International Conference on High Performance Computing and Communications (HPCC-06), Munich, Germany.

Organizing committee for 2nd OSIHPA (Operating System Interference in High Performance Applications) workshop at PACT 2006 conference, Sept. 2006, Seattle, Washington.

Review committee member for 2006 LANL LDRD-ER Computer Science subject area.

Organizer for "Algorithms for Image Analysis in Scientific Data" Mini-Symposium, SIAM Imaging Science 2006 conference, Minneapolis, Minnesota.

Reviewer for IEEE Transactions on Parallel and Distributed Systems.

Reviewer for IEEE Transactions on Computers.

Industry mentor for 2005 UCLA IPAM Research in Industrial Projects for Students (RIPS) program. Project title : "Building Super-Resolution Imaging Systems Using Low Resolution Cameras". Team : Jennifer Rees, Rajendra Appama, Mihai Bailesteanu, Bruno Galerne.

Organizing committee for OSIHPA (Operating System Interference in High Performance Applications) workshop at PACT 2005 conference, Sept. 2005, St. Louis, Missouri.

Participant at UCLA IPAM 2005 summer school on Intelligent Extraction of Information from Graphs and High Dimensional Data.

Program committee member for Compframe 2005, Workshop on High Performance Component Models and Frameworks. June 2005, Atlanta, Georgia.

Program committee member for HIPS 2004 workshop, IPDPS 2004 conference, Santa Fe, NM.

Co-organizer for "Design Patterns for High Performance Component Architectures" mini-symposium, SIAM PP'04 Conference, San Francisco, CA, February 2004.

Participant, "SCaLeS: A Science-Based Case for Large-Scale Simulation" workshop, Arlington, VA., June 2003.

Professional societies

Sigma Xi, Full Member
American Physical Society (APS)
Association for Computing Machinery (ACM)
Society of Industrial and Applied Mathematics (SIAM)
Institute of Electrical and Electronics Engineers (IEEE)
International Society of Artificial Life (ISAL)