Genevieve Beth Orr

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Education

- **Ph.D., Computer Science,** Oregon Graduate Institute, 1995
- **M.S., Applied Mathematics**, Drexel University, 1986
- **M.S., Physics, University of Wisconsin**, 1982
- **B.A., Physics and Mathematics**, Grinnell College, 1979

Work Experience

- **Willamette University, Computer Science Department.** Full Professor (2008-present), Associate Professor (2002-2008), Assistant Professor (1995-2002). Teaching includes wide range of undergraduate computer science courses including computer graphics for both computer science majors and non-majors, as well as interdisciplinary study courses in 3D animation. Primary research interest: computer graphics and animation.

- **Intel Corporation**, 1/98-6/98 Visiting Faculty. Application of genetic programming and machine learning techniques to automatic test generation of computer chips.

- **Oregon Graduate Institute,** 9/91-9/95 Graduate Research Assistant. Modeling statistical dynamics of stochastic learning in neural networks and development of fast neural network learning algorithms.

- **Quantics, Inc.**, 3/85-8/90 and summer 1984. Senior Operations Research Analyst (1988-90), Senior Programmer/Analyst (1986-87), Programmer Analyst (1984-86). Development and implementation of mathematical models used for long-term prediction of non-nuclear ordnance and electronic countermeasures. Clients included U.S. Navy, U.S. Marine Corps, and NATO.

- **Spring Garden College**, 1/83--5/85 Mathematics and Physics Instructor.

- **University of Wisconsin**, 9/79-12/79, 1/82-5/82 Graduate Teaching Assistant in Physics.

- **University of Wisconsin**, 1/80--1/82 Graduate Research assistant in Nuclear Physics. Nuclear polarization experiments on Tandem Van de Graaff and participation in the building of spin-refrigerator polarized proton target.

- **Brookhaven National Laboratory**, Summers 1978 & 1979 Student Internship with Nuclear Physics Group. Research on new models of nuclear structure through the study of neutron capture experiments performed at Brookhaven's High Flux Beam Reactor.

Professional Affiliations

Association for Computing Machinery (ACM); ACM SIGGRAPH (Special Interest Group in Computer Graphics); ACM SIGCSE (Special Interest Group in Computer Science Education); ACM Cascade SIGGRAPH Chapter Interest Group; Consortium for Computing in Small Colleges – Northwest (CCSC-NW)

Professional Services

- **Consortium for Computing Sciences in Colleges Northwestern Region (CCSC-NW)**:
  1999-present: member and conference attendee; 2011: program chair, paper reviewer, moderator; 2000-2010: member and conference attendee; 2008-2009: panels and tutorials chair; 2007-2008

program co-chair; 2002-2008: journal editor and board member; 2004: conference chair (conference held at Willamette University); 2002: program chair; 2001: program chair; 2000: program co-chair and paper reviewer

- **ACM Special Interest Group in Computer Graphics (SIGGRAPH)**:
  1997&1999-present: SIGGRAPH member and conference attendee; 2011: participated in "Visualization Curriculum" meeting and chaired "Graphics Knowledge Base" meeting of the SIGGRAPH Education Committee; 2003-2008: member of the SIGGRAPH Education Committee: Curriculum Working Group; 2001: Education Committee paper reviewer, Educators Program Session Chair

- **Expanding Your Horizons**:
  Jan 2009 - 2011, Willamette University. Led a workshop for middle school girls on programming in the context of art and animation using the Scratch programming environment (in 2009 & 10) and 3D modeling using SketchUp (in 2011).

- **Eurographics**:
  2009, Munich Germany. Conference attendee and participant in the post-conference *Computer Graphics Education Workshop: Teaching Computer Graphics in Context.* 2008, Crete, Greece. Education Programme Committee member; 2006: Vienna, Austria. Conference attendee and participant in the post-conference *Workshop on Computer Graphics Education.*

- **Future Potential in Computing (FPC) :** Co-organizer and host for event on Feb 10, 2007 at Willamette University. FPC refers to a series of half-day high school outreach events to encourage students to pursue education and careers in computer science and related fields. Also served on organizing committee for FPC events at Pacific Lutheran University(12/06) , Gonzaga University (2/07), and University of Portland (5/07).

- **Microsoft Academic Days on Game Development in Computer Science Education**: Orlando, FL, Feb 22-25, 2007, invited participant.

- **National Science Foundation's Course, Curriculum, and Laboratory Improvement: Adaptation and Implementation track. (CCLI-A&I)**: grant reviewer on Feb 4-7, 2004 (panel member) and Jan 31-Feb 1, 2005 (panel chair), Washington, DC.

- **National Science Foundation:** proposal reviewer, 2005.

- **Oregon School for the Deaf:** 2002-2004 member of the Visual Communications Advisory Board.

- **IEEE Transactions on Neural Networks**: paper reviewer.

- **Neural Information Processing Systems 9 Conference:**
  - 1996 Paper Reviewer and Workshop co-organizer with K. R. Müller, Conference post-conference meeting. *Tricks of the Trade: How to make algorithms really work.*

- **Conference on Curricular Innovations to Promote Software Development Skills:** Scholar in residence and speaker coordinator for neural nets track at the conference, sponsored by Evergreen, NSF, Washington, Center for Improving the Quality of Undergraduate Education, July 7-11, 1996

Selected Grants

- *2013-2016:* **The Andrew W. Mellon Foundation**, "Learning by Creating: An Arts and Humanities Initiative". Contributed to the proposal writing and grant oversight. Served as student grant mentor. Received Visiting Artist grant.

- *2011-2014:* Consultant for: **National Science Foundation (NSF)** */BIO/ Advances in Biological Informatics (ABI) Project: VISualization of Terrestrial-Aquatic Systems (VISTAS)* The VISTAS project, includes scientists at The Evergreen State College and Oregon State University whose goal is to develop visual analytics software to enable scientists to better understand and communicate about large and complex environmental problems that span spatial and temporal scales.

- 2008-2012: **National Science Foundation (NSF)** CISE Pathways to Revitalized Undergraduate Computing Education (CPATH): *Building the Northwest Distributed Computer Science Department.* $382K. PIs: Scott Wallace, Robert Bryant, and Genevieve Orr. http://ai.vancouver.wsu.edu/~nwdcsd/wiki/
- 2004-2007: **W.M. Keck Foundation**, *Music and Computer Graphics Program as the Core of an Interdisciplinary Minor in Arts and Technology*, $500K. This grant led to the creation of a new interdisciplinary minor in Arts, Technology & Multimedia.

Books

- G. Montavon, G. B. Orr, and K. R. Müller. *Neural Networks: Tricks of the Trade*. Second edition. Lecture Notes in Computer Science, vol 7700, Springer, 2012.
- G.B. Orr and K. R. Müller, eds., *Neural Networks: Tricks of the Trade*, Lecture Notes in Computer Science 1524, Springer-Verlag, 1998, ISBN 3540653112.

Contributing Editor

- *The Journal of Computing Sciences in Colleges*: Volume 23, Number 2, December 2007; Volume 22, Number 2, December 2006; Volume 21, Number 1, October 2005; Volume 19, Number 2, Dec 2003.

Invited Talks

- Orr, G. B., "Topics in Computer Graphics", invited speaker for *Software Originated Software; Computer Graphics*, The Evergreen State College, Spring 2014.
- Orr, G. B., "Processing Power", invited speaker for *Computing in the Service of Science*, PLATO Lecture Series, The Evergreen State College, Spring 2013.
- Orr, G. B., "Music and Animation: Greater than the Sum of its Parts", invited speaker for *The Real and the Unreal: Computer Animation Approaches to Representation*, PLATO Lecture Series on Forest Animation, The Evergreen State College, Spring 2007.
- Orr, G. B., "Adaptive Batch Sizes and Stochastic Search", invited speaker at GMD First (Forschungszentrum Informationstechnik), Rudower Chaussee 5, 12489 Berlin, Germany, June 5, 1996.

Position Papers

- Orr, G. B., position paper submitted to *Computer Graphics Education Workshop 2009: Teaching Computer Graphics in Context",* Munich, Germany, March 29-30, 2009.
- Orr, G. B., "Computer Graphics in the Curriculum: An Interdisciplinary Approach", initial position paper submitted to *Workshop on Computer Graphics Education 2006: "Defining an International Curriculum in Computer Graphics",* Vienna, Austria, September 9, 2006.
- Orr. G., Computer and Information Science and Engineering (CISE) Directorate at the National Science Foundation Integrative Computing Education & Research (ICER): *Preparing IT Graduates for 2010 and Beyond*, Stanford University, January 27-28, 2006 http://www.evergreen.edu/icer/.

Workshops, Panels, Posters, Tutorials, Talks

- M. Bailey, et al., Panel: 3D Printing in the Classroom and Laboratory – Panel Discussion. *J. Comput. Sci. Coll.* (October 2015, in press).
- K. A. Schmal, C. Thomas, J. Cushing, and G. Orr. Visualizing Valley Wind Flow. In *ACM SIGGRAPH 2015 Posters*, (SIGGRAPH '15). ACM, New York, NY, US.
- R. Bryant, J. Cushing, J. Orr, M. Dickerson, and R. Weiss. 2014. The impact of computing courses for non-majors. *J. Comput. Sci. Coll.* 30, 1 (October 2014), 176-177.

- J. B. Cushing, N. Molnar, V. Ratanasangpunth, M. Bailey, J. Bolte, A. Brookes, D. Lach, J. Mangue, B. McKane, G. Orr, Emily Platt, K. Schmal, S. Stafford, C. Thomas, P. Wingo, K. Winters, D. Witherspoon. Visualizing Terrestrial and Aquatic Systems in 3D. *VisWeek 2014*, November 11-18, 2014, Paris, France.

- Wilson, B. et. al. Panel: MOOCs and their impact on CS education. *J. Comput. Sci. Coll.* 29, 1 (October 2013), 110-112.

- Orr, G., 2012. Birds of a Feather (BOF): Teaching Artists to Program with Algorithmic Art, presented at *SIGGRAPH, 2012, The 39th International Conference And Exhibition on Computer Graphics and Interactive Techniques*, Aug 5-9, 2012, Los Angeles, CA (see *http://s2012.siggraph.org/attendees/birds-feather*)

- Orr, G., 2012. Tutorial: A Recursive Ray Tracer Assignment. *J. Comput. Sci. Colleges.* 28, 1 (October 2012), 217-219.

- Bailey, M., Lewis, R. R., Weiss, R., Wolff, D. A., Orr, G. 2010. Panel: The Impact of OpenGL 3.X and 4.0 on the Teaching of Computer Graphics. *J. Computing Sciences in Colleges*.

- Wallace, S. A., Bryant, R., and Orr, G. 2009. The Northwest Distributed Computer Science Department. *J. Computing Sciences in Colleges.* 25, 1 (Oct. 2009), 143-148.

- Cushing, J., Stevenson-Molnar, N., Weiss, R., Zeman, L., Lewis, R. R., Orr, G., and Wolff, D. A. 2009. Topics in digital terrain modeling. *J. Computing Sciences in Colleges.* 25, 1 (Oct), 130-132.

- Orr, G., Bryant, R., and Weiss, R. 2009. Algorithmic art. *J. Computing Sciences in Colleges.* 25, 1 (Oct), 172-172.

- Orr, G. 2009. Computational thinking through programming and algorithmic art. In *SIGGRAPH 2009: Talks* (New Orleans, Louisiana, August 03 - 07, 2009). SIGGRAPH '09. ACM, New York, NY, 1-1.

- Dake, P., Bryant, R. Khoja, S., and Orr, G. 2008. Workshop: Designing a Collaborative Cross-Campus Airport (or Other Transit) Simulation Project. *J. Computing Sciences in Colleges*, 24, 2.

- Wolff, D., Sung, K., Orr, G., and Wilson, B. 2008. Panel: The Content and Role of the Computer Graphics Course in the Liberal Arts. *J. Computing Sciences in Colleges*, 24, 2.

- Rosenberg, J., Smith, T., Steiner, S., Wallace, S., and Orr, G. (organizer). 2007. Panel: Game Development Courses in the Computer Science Curriculum. *J. Computing Sciences in Colleges*, 23, 2, 65-66.

- Orr, G. and Bryant R., 2007. Workshop: Designing a Cross-Campus Collaborative Project. *J. Sciences in Colleges*, 23, 2, 7-8.

- Bryant R., Letchner, J., Rosenberg, J., and Orr, G. 2007. Workshop: Improving "Introduction to Computing" Courses at both High School and Post Secondary Levels, 23, 2, 69-70.

- Orr, G. and Bryant R., 2007. Workshop: CPATH Workshop – Preparing for the next Proposal. *This was a 2007 CCSC-NW post –conference workshop.*

- Drake, P., Orr, G., and Cushing, J. B. 2006. Panel: Games in the Computer Science Classroom. *J. Sciences in Colleges.* 22, 2, 97-98.

- Orr, G. B. 2006. Tutorial: How to Produce a 3D Computer Animated Short in One Semester. *J. Sciences in Colleges* 22, 2, 74-74.

- Cushing, J., Bryant, R., Orr, G., Spengler, S., Tuttle, S., and Yasuhara, K. 2006. Panel: NSF'S Integrative Computing Education and Research (ICER) initiative: whither the northwest. *Sciences in Colleges.* 22, 2, 49-51

- Nord, M. and Orr, G. 2005. Willamette Faculty Colloquium Presentation, *A New Model for Interdisciplinary Teaching and Collaboration in Multimedia*, Feb 11.

- Nord, M. and Orr, G. 2003. Willamette Faculty Colloquium: *Transitions: A Professional Development Model for Collaborative Multimedia Creation*. April 11.

- Orr, G. 2000. An introduction to Java3D (tutorial presentation). In Proceedings of the Second Annual CCSC on Computing in Small Colleges Northwestern Conference (Oregon Graduate Institute, Beaverton, Oregon). Consortium for Computing Sciences in Colleges. Consortium for Computing Sciences in Colleges, 6.

- Orr, G. B. and Leen, T.K. 1995. "Dynamics and Algorithms for Stochastic Learning", oral presentation at Machines that Learn, Snowbird, Utah.

Other Publications and Presentations

- Orr, G. 2011. Classroom Explorations in 3D Stereoscopy (S3D), *Journal of Computing Sciences in Colleges*, 27, 1 (October 2011), 120-126.

- Bryant, R., Orr, G., Weiss, R., and Yerion. K. 2011. Using the Context of Algorithmic Art to Change Attitudes in Introductory Programming, *Journal of Computing Sciences in Colleges*, October 27, 1 (October 2011), 112-119.

- Ater Kranov, A, Bryant, R., Orr, G., Wallace, S. A., Zhang, M., Developing a Community Definition and Teaching Modules for Computational Thinking: Accomplishments and Challenges. *In Proceedings of the 11th ACM Conference on Sig-information Technology Education*. SIGITE 2010.

- Alley, T., Laxer, C., Flaxman, T., Geigel, J., Gold, S., Hitchner, L., Orr, G., Pollack, B. W., and Sanders, C. 2007. Knowledge Base for the Emerging Discipline of Computer Graphics. Won Honorable Mention for Outstanding Contribution in the *Special Issue: Spreading the Computer Graphics Curriculum, CGEMS: Computer Graphics Educational Materials Server* http://cgems.inesc.pt/.

- Alley, T., Laxer, C., Flaxman, T., Geigel, J., Gold, S., Hitchner, L., Orr, G., and Pollack, B. W. 2006. Knowledge Base for the Emerging Discipline of Computer Graphics. In *ACM SIGGRAPH 2006 Educators Program* (Boston, Massachusetts, July 30 - August 03, 2006). SIGGRAPH '06. ACM Press, New York, NY, 32.

- Orr, G. and Nord, M. 2005. A New Collaborative Teaching Model Applied to Digital Music and 3D Computer Animation, *Journal of Computing Sciences in Colleges*, October.

- Orr, G. B. 2005. A new model of interaction: digital music and 3D animation. In *ACM SIGGRAPH 2005 Educators Program* (Los Angeles, California, July 31 - August 04, 2005). P. Beckmann-Wells, Ed. SIGGRAPH '05. ACM Press, New York, NY, 41.

- Nord, M. and Orr, G. 2003. "Interdisciplinary Classes to Continue", *Bits, Bytes & Nybbles*, Willamette Integrated Technology Services Newsletter, Fall.

- Nord, M. and Orr, G. 2003. "Transitions: A Professional Development Model for Collaborative Multimedia Creation", *ED-MEDIA*.

- Ruehr, F. and Orr, G. 2002. "Interactive Program Demonstration as a Form of Student Program Assessment", *The Journal of Computing Sciences in Colleges* 18, 2.

- Orr, G. B. 2001. "An Interdisciplinary Approach to Computer Graphics", *The Journal of Computing in Small Colleges* 17, 2.

- Orr, G. B. 1996. "Removing Noise in On-Line Search using Adaptive Batch Sizes", *Advances in Neural Information Processing Systems 9*.

- Orr, G. B. and Leen, T. K. 1996. "Using Curvature Information for Fast Stochastic Search", *Advances in Neural Information Processing Systems 9*.

- Orr , G. B. 1995. *Dynamics and Algorithms for Stochastic Search*, PhD Thesis, Oregon Graduate Institute.
- Leen, T. K. and Orr, G. B. 1995. Stochastic Learning: Beyond the Diffusion Approximation, abstract for *Machines that Learn*, Snowbird, Utah.
- Leen, T. K. and Orr G. B. 1994. Optimal Stochastic Search and Adaptive Momentum, *Advances in Neural Information Processing Systems 6*.
- Orr,G. B. and Leen, T. K.1994. Faster Stochastic Gradient Descent, abstract for *Neural Networks in Computing*, Snowbird, Utah.
- Orr, G. B. and Leen, T. K. 1994. "Momentum and Optimal Stochastic Search", *Proceedings of the 1993 Connectionist Models Summer School*, M. C. Mozer, P. Smolensky, D. S. Touretzky, J. L. Elman, & A. S. Weigend (Eds.).
- Orr, G. B. and Leen, T. K.1993. "Weight Space Probability Densities in Stochastic Learning: II. Transients and Basin Hopping Times", *Advances in Neural Information Processing Systems 5*.
- Leen, T. K. and Orr, G. B. 1992. "Weight-Space Probability Densities and Convergence Times for Stochastic Learning", *International Joint Conference on Neural Networks*, Baltimore.
- Leen, T. K. and Orr, G. B. 1992. "Weight-Space Densities in Stochastic Learning", *Proc. Canadian Conf. on Electrical and Computer Eng.*, ISBN 0-9694170-3-9, Vol.2, pp.MA6.7.1-MA6.7.4, Toronto, Ontario, Sep. 13-16.
- Leen, T. K. and Orr, G. B. 1992. Weight-Space Distributions and Convergence Times for Stochastic Learning, abstract for *Neural Networks in Computing*, Snowbird, Utah.
- Davidson, W. F., *et al.* 1981. "Identification of All Intrinsic Excitations Below 2 MeV in ^{168}Er", *Journal of Physics G*, 7, 4.
- Orr, G. B. *et al*. 1978. 16.3 eV Neutron Capture in ^{107}Ag: Nuclear Structure of ^{108}Ag, *Neutron Capture Gamma-Ray Spectroscopy*, September.

Member of Doctoral Dissertation Committee

- PhD committee member (1999) for Johann E.W. Holm, *Sampled Optimization for Training Perceptron Neural Networks*, Department of Electrical and Electronic Engineering, University of Pretoria, Pretoria, South Africa.

Additional Honors

Phi Beta Kappa, 1979 H. George Apostle Prize in Physics (Grinnell College), 1979 Linn Smith Prize for Excellence in Mathematics (Grinnell College)