Lee Spector

Internet	lspector@amherst.edu http://leespector.com
Office	C211 Science Center Department of Computer Science Amherst College Amherst, MA 01002-5000
Home	34 Columbus Avenue Northampton, MA 01060
Citizenship	U.S.A.

Education

Ph.D., University of Maryland, Department of Computer Science, May 1992
Dissertation: Supervenience in Dynamic-World Planning
Advisor: James Hendler
Principal area: Artificial Intelligence
Other areas: Programming Languages, Theory of Computation
Additional graduate study at George Washington University, Washington D.C.

B.A., Oberlin College, Department of Philosophy, May 1984
Other areas: Computer Music, Aesthetics, Conceptual Art, Visual Arts
Active in the Technology in Music and Related Arts (TIMARA) program

Research Interests

Artificial intelligence, artificial life, genetic and evolutionary computation, quantum computation, human and machine learning, computational models of creative processes, computation in the arts, computer science education

Employment

Class of 1993 Professor of Computer Science
Chair of Department of Computer Science
Department of Computer Science — July, 2019 – present
Amherst College, Amherst, MA
Initially hired as Visiting Professor, Tenured 7/21
Appointed to named chair 7/22
Appointed as department chair 7/24

Professor of Computer Science, Emeritus
Director, Institute for Computational Intelligence
School of Cognitive Science — July, 1992 – present
Hampshire College, Amherst, MA
Emeritus status since 7/22
Full professor rank since 7/04
Acting Dean, Cognitive Science, 10/15–1/16
Co-director, Design, Art & Tech, 4/09–1/13
Dean, Cognitive Science, 7/02–6/05
Faculty Trustee, 7/98–6/00
MacArthur Chair, 7/97–6/00

Adjunct Professor and Associated Five-College Graduate Faculty member
College of Information and Computer Sciences — September, 2007 – present
University of Massachusetts, Amherst, MA

Research Associate and Visiting Assistant Professor of Computer Science
Department of Computer Science — August 1995 – July 1996
University of Maryland at College Park

Faculty Research Assistant
Department of Computer Science — March 1992 – June 1992
University of Maryland at College Park

Graduate Research Assistant
Systems Research Center — August 1988 – March 1992
University of Maryland at College Park

Graduate Research Assistant
Computer Vision Lab — January 1987 – June 1988
University of Maryland at College Park

Human Interface Programmer
Academic Hospital of Groningen — Summer 1987
Groningen, The Netherlands

Graduate Teaching Assistant
Department of Computer Science — Fall 1986
University of Maryland at College Park

Graduate Research Assistant
Institute for Artificial Intelligence — June 1986 – January 1987
George Washington University, Washington D.C.

Artificial Intelligence Programmer
Intellitek Inc. — Summer 1986
Washington D.C.

Graduate Teaching Assistant
Department of Computer Science — Spring 1986
George Washington University, Washington D.C.

Graduate Research Assistant
Department of Computer Science — August 1985 – June 1986
George Washington University, Washington D.C.

Chief Engineer
WOBC Radio — Spring 1984
Oberlin, Ohio

PROFESSIONAL POSITIONS

Editor-in-Chief
Genetic Programming and Evolvable Machines 2009–2024
A Springer journal
Advisory Board member after editorship

Associate Editor
ACM Transactions on Evolutionary Learning and Optimization 2019–present
An Association for Computing Machinery journal

Member, Editorial Board
Evolutionary Computation 2005–present
An MIT Press journal

Member, Executive Board
ACM SIGEVO 2005–2023
Association for Computing Machinery
Special Interest Group on Genetic and Evolutionary Computation
Formerly the *International Society for Genetic and Evolutionary Computation*

PUBLICATIONS

Books

Banzhaf, W., L. Spector, and L. Sheneman, editors. 2019. *Genetic Programming Theory and Practice XVI.* New York: Springer.

Spector, L. 2007 and 2004. *Automatic Quantum Computer Programming: A Genetic Programming Approach.* New York: Springer Science+Business Media, 2007 (softcover). Boston: Kluwer Academic Publishers, 2004 (hardcover).

Deb, K., R. Poli, W. Banzhaf, H-G Beyer, E. Burke, P. Darwen, D. Dasgupta, D. Floreano, J. Foster, M. Harman, O. Holland, P. Lanzi, L. Spector, A. Tettemanzi, D. Thierens and A. Tyrrell, editors. 2004. *Proceedings of the Genetic and Evolutionary Computation Conference, GECCO-2004.* Lecture Notes in Computer Science, Vol. 3102-3103, Springer-Verlag.

Spector, L., E. Goodman, A. Wu, W.B. Langdon, H.-M. Voigt, M. Gen, S. Sen, M. Dorigo, S. Pezeshk, M. Garzon, and E. Burke, editors. 2001. *Proceedings of the Genetic and Evolutionary Computation Conference, GECCO-2001.* San Francisco, CA: Morgan Kaufmann Publishers.

Whitley, D., D. Goldberg, E. Cantú-Paz, L. Spector, I. Parmee, and H.-G. Beyer, editors. 2000. *Proceedings of the Genetic and Evolutionary Computation Conference, GECCO-2000.* San Francisco, CA: Morgan Kaufmann Publishers.

Spector, L., U.-M. O'Reilly, W. Langdon, and P. Angeline, editors. 1999. *Advances in Genetic Programming, Volume 3.* Cambridge, MA: MIT Press.

Journal Publications

Dutykh, D., R. Escobedo, and L. Spector. 2026. Modeling how hunting strategies and pack size shape each other. In *Journal of Theoretical Biology*, Vol. 623, 21 May 2026, 112390.

Spector, L., and L. Trujillo. 2024. Chief editorship transition. In *Genetic Programming and Evolvable Machines*, Vol. 24, article number 22.

Boldi, R., M. Briesch, D. Sobania, A. Lalejini, T. Helmuth, F. Rothlauf, C. Ofria, and L. Spector. 2024. Informed Down-Sampled Lexicase Selection: Identifying Productive Training Cases for Efficient Problem Solving. In *Evolutionary Computation*, Vol. 32, No. 4, pp. 307–337.

Ding, L., and L. Spector. 2023. Multi-Objective Evolutionary Architecture Search for Parameterized Quantum Circuits. In *Entropy*, Vol 25, No. 1: 93.

Spector, L. 2022. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 23, No. 1, pp. 1–2.

Helmuth, T., and L. Spector. 2021. Problem-solving benefits of down-sampled lexicase selection. In *Artificial Life*, Vol 27, Issue 3–4, pp. 183–203. `https://doi.org/10.1162/artl_a_00341`

Spector, L. 2021. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 22, No. 1, pp. 1–2.

Helmuth, T., Pantridge, E., and L. Spector. 2020. On the importance of specialists for lexicase selection. In *Genetic Programming and Evolvable Machines*, Vol. 21, pp. 349–373. https://doi.org/10.1007/s10710-020-09377-2. Full text at: https://t.co/M4NYyOjk4S

Spector, L. 2020. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 21, No. 1, pp. 1–2.

O'Neill, M., and L. Spector. 2020. Automatic programming: The open issue? In *Genetic Programming and Evolvable Machines*, Vol. 21, pp. 251–262. https://doi.org/10.1007/s10710-019-09364-2. Full text at: https://rdcu.be/bQUA2

Spector, L. 2019. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 20, No. 1, pp. 1–2.

La Cava, W., S. Silva, K. Danai, L. Spector, L. Vanneschi, and J. H. Moore. 2019. Multidimensional genetic programming for multiclass classification. In *Swarm and Evolutionary Computation*, Vol. 44, pp. 260–272. https://doi.org/10.1016/j.swevo.2018.03.015

La Cava, W., T. Helmuth, L. Spector, and J. H. Moore. 2018. A Probabilistic and Multi-Objective Analysis of Lexicase Selection and ϵ-Lexicase Selection. In *Evolutionary Computation*, Vol. 27, Issue 3, pp. 377–402. https://doi.org/10.1162/evco_a_00224.

Clark, D. M., and L. Spector. 2018. Evolution of algebraic terms 3: Term continuity and beam algorithms. In *International Journal of Algebra and Computation*, Vol. 28, No. 05, pp. 759–790. https://doi.org/10.1142/S0218196718500352.

Spector, L. 2018. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 19, No. 1–2, pp. 1-2.

Spector, L. 2017. Introduction to the peer commentary special section on "On the Mapping of Genotype to Phenotype in Evolutionary Algorithms" by Peter A. Whigham, Grant Dick, and James Maclaurin. In *Genetic Programming and Evolvable Machines*, Vol. 18, No. 3, pp. 351–352. DOI: 10.1007/s10710-017-9287-y

McCaffrey, T., and L. Spector. 2017. An approach to human-machine collaboration in innovation. In *AI-EDAM: Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, DOI: https://doi.org/10.1017/S0890060416000524

DelRosso, N. V., S. Hews, L. Spector, and N. D. Derr. 2017. A Molecular Circuit Regenerator to Implement Iterative Strand Displacement Operations. In *Angewandte Chemie International Edition*, DOI: https://doi.org/10.1002/anie.201610890.

Spector, L. 2017. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 18, No. 1, pp. 1–2.

Taylor, T., M. Bedau, A. Channon, D. Ackley, W. Banzhaf, G. Beslon, E. Dolson, T. Froese, S. Hickinbotham, T. Ikegami, B. McMullin, N. Packard, S. Rasmussen, N. Virgo, E. Agmon, E. Clark, S. McGregor, C. Ofria, G. Ropella, L. Spector, K. O. Stanley, A. Stanton, C. Timperley, A. Vostinar, and M. Wiser. 2016. Open-Ended Evolution: Perspectives from the OEE Workshop in York. In *Artificial Life*, Vol. 22, No. 3, pp. 408–423.

La Cava, W., K. Danai, and L. Spector. 2016. Inference of compact nonlinear dynamic models by epigenetic local search. In *Engineering Applications of Artificial Intelligence*, Vol. 55, pp. 292–306.

La Cava, W., K. Danai, L. Spector, P. Fleming, A. Wright, and M. Lackner. 2016. Automatic identification of wind turbine models using evolutionary multiobjective optimization. In *Renewable Energy*, Vol. 87, Part 2, pp. 892–902.

Clark, D. M., M. Keijzer, and L. Spector. 2016. Evolution of algebraic terms 2: Deep drilling algorithm. *In International Journal of Algebra and Computation*, Vol. 26, No. 6, pp. 1141–1176.

Banzhaf, W., B. Baumgaertner, G. Beslon, R. Doursat, J. A. Foster, B. McMullin, V. Veloso de Melo, T. Miconi, L. Spector, S. Stepney, and R. White. 2016. Defining and simulating open-ended novelty: requirements, guidelines, and challenges. In *Theory in Biosciences*, pp. 1–31.

Spector, L. 2016. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 17, No. 1, pp. 1–2.

Spector, L. 2015. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 16, No. 1, pp. 1–2.

Helmuth, T., L. Spector, and J. Matheson. 2014. Solving Uncompromising Problems with Lexicase Selection. In *IEEE Transactions on Evolutionary Computation*. DOI: 10.1109/TEVC.2014.2362729.

Escobedo, R., C. Muro, L. Spector, and R. P. Coppinger. 2014. Group size, individual role differentiation and effectiveness of cooperation in a homogeneous group of hunters. In *Journal of the Royal Society Interface*, Vol. 11, No. 95, 20140204, pp. 1–10.

Spector, L. 2014. Peer commentary on Wolfgang Banzhaf's "Genetic Programming and Emergence." In *Genetic Programming and Evolvable Machines*, Vol. 15, No. 1, pp. 61–62.

Spector, L. 2014. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 15, No. 1, pp. 1–2.

Spector, L. 2013. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 14, No. 1, pp. 1–2.

McCaffrey, T., and L. Spector. 2012. Behind every innovative solution lies an obscure feature. In *Knowledge Management & E-Learning: An International Journal*, Vol. 4, No. 2, pp. 146–156.

Spector, L. 2012. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol.

13, No. 1, pp. 1–2.

Muro, C., R. Escobedo, L. Spector, and R. P. Coppinger. 2011. Wold-pack (*Canis lupus*) hunting strategies emerge from simple rules in computational simulations. In *Behavioural Processes*, Vol. 88, pp. 192–197.

Muro, C., R. Escobedo, R. P. Coppinger, and L. Spector. 2011. Wolf-pack hunting strategy: an emergent collective behavior described by a classical robotic model (abstract). In *Journal of Veterinary Behavior: Clinical Applications and Research*, Vol. 6, No. 1, p. 94.

Spector, L. 2011. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 12, No. 1, pp. 1–2.

Niekum, S., A. Barto, and L. Spector. 2010. Genetic Programming for Reward Function Search. In *IEEE Transactions on Autonomous Mental Development*, Vol. 2, No. 2, pp. 83–90.

Spector, L. 2010. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 11, No. 1, pp. 1–2.

Spector, L. 2009. Editorial Introduction. In *Genetic Programming and Evolvable Machines*, Vol. 10, No. 1, pp. 1–2.

Spector, L. 2008. Introduction to the Special Issue on Genetic Programming for Human-Competitive Designs. In *AI-EDAM: Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, Vol. 22, No. 3, pp. 183–184.

Spector, L., and J. Klein. 2008. Machine Invention of Quantum Computing Circuits by Means of Genetic Programming. In *AI-EDAM: Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, Vol. 22, No. 3, pp. 275–283.

Spector, L. 2006. Evolution of Artificial Intelligence. In *Artificial Intelligence*, Vol. 170, Issue 18, pp. 1251–1253.

Spector, L., and J. Klein. 2006. Genetic Stability and Territorial Structure Facilitate the Evolution of Tag-mediated Altruism. In *Artificial Life*, Vol. 12, No. 4, pp. 553–560.

Spector, L., J. Klein, and K. Harrington. 2005. Selection Songs: Evolutionary Music Computation. In *YLEM Journal*, Vol. 25, No. 6 & 8, pp. 24–26.

Spector, L., J. Klein, C. Perry, and M. Feinstein. 2005. Emergence of Collective Behavior in Evolving Populations of Flying Agents. In *Genetic Programming and Evolvable Machines*, Vol. 6, No. 1, pp. 111–125.

Spector, L. 2002. Book Review: The Quest for the Quantum Computer, by J. Brown. In *Genetic Programming and Evolvable Machines*, Vol. 3, No. 4, pp. 391–393.

Spector, L., and A. Robinson. 2002. Genetic Programming and Autoconstructive Evolution with the Push Programming Language. In *Genetic Programming and Evolvable Machines*, Vol. 3, No. 1, pp. 7–40.

Spector, L. 2002. Hierarchy Helps it Work That Way. In *Philosophical Psychology*, Vol. 15, No. 2 (June, 2002), pp. 109–117.

Rattermann, M.J., L. Spector, J. Grafman, H. Levin, and H. Harward. 2001. Partial and

total-order planning: evidence from normal and prefrontally damaged populations. In *Cognitive Science*, Vol. 25, No. 6 (November/December, 2001), pp. 941–975.

Barnum, H., H.J. Bernstein, and L. Spector. 2000. Quantum circuits for OR and AND of ORs. *Journal of Physics A: Mathematical and General*, Vol. 33 No. 45 (17 November, 2000), pp. 8047–8057.

Spector, L. 2000. The Evolution of Arbitrary Computational Processes. In *IEEE Intelligent Systems*, May/June 2000, pp. 80–83.

Spector, L. 1997. Automatic Generation of Intelligent Agent Programs. In *IEEE Expert.* Jan–Feb 1997, pp. 3–4.

Spector, L. 1996. Social Structure in Evolutionary Computation Systems. In *Communication and Cognition–Artificial Intelligence.* Vol. 13, nos 2–3. pp. 141–161.

Spector, L. 1995. Artificial Intelligence as the Liberal Arts of Computer Science. In *SIGART Bulletin: Special Issue on AI Education.* Volume 6, Number 2, pp. 8–10. The Association for Computing Machinery.

Evett, M. P., J. A. Hendler, and L. Spector. 1994. Parallel Knowledge Representation on the Connection Machine. *Journal for Parallel and Distributed Computing.* Volume 22, number 2, pp. 168–184.

Grafman, J., A. Sirigu, L. Spector, and J. Hendler. 1993. Damage to the prefrontal cortex leads to decomposition of structured event complexes. In *The Journal of Head Trauma Rehabilitation,* Volume 8, Number 1, Aspen Publishers, Inc., pp. 73–87.

Spector, L. and J. Hendler. 1992. Planning and Reacting Across Supervenient Levels of Representation. In *International Journal of Intelligent and Cooperative Information Systems,* Volume 1, Numbers 3 & 4, pp. 411–449.

Spector, L. and J. Hendler. 1989. Book Review: Minimal Rationality, by C. Cherniak. In *Artificial Intelligence,* Volume 39, Number 1.

Conference and Workshop Papers

Bahlous-Boldi, R., L. Ding, L. Spector, and S. Niekum. 2025. Pareto Optimal Learning from Preferences with Hidden Context. In *Reinforcement Learning Conference, RLC 2025.*

Bahlous-Boldi, R,, M. Faldor, L. Grillotti, H. Janmohamed, L. Coiffard, L. Spector, and A. Cully. 2025. Dominated Novelty Search: Rethinking Local Competition in Quality-Diversity. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '25).* Association for Computing Machinery, New York, NY, USA, 104–112.

Ni, A., and L. Spector. 2024. Effective Adaptive Mutation Rates for Program Synthesis. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '24).* Association for Computing Machinery, New York, NY, USA.

Helmuth, T., J. Fedoroff, E. Pantridge, and L. Spector. 2024. Facilitating Function Application in Code Building Genetic Programming. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '24).* Association for Computing Machinery, New York, NY, USA.

Boldi, R., A. Bao, M. Briesch, T. Helmuth, D. Sobania, L. Spector, and A. Lalejini. 2024.

Untangling the Effects of Down-Sampling and Selection in Genetic Programming. In *Proceedings of the 2024 Artificial Life Conference. ALIFE 2024*. MIT Press, Cambridge, MA, USA.

Ding, L., J. Zhang, J. Clune, L. Spector, and J. Lehman. 2024. Quality Diversity through Human Feedback: Towards Open-Ended Diversity-Driven Optimization. In *Proceedings of The Forty-first International Conference on Machine Learning, ICML-2024*.

Ni, A., Ding, L., and Spector, L. 2024. DALex: Lexicase-Like Selection via Diverse Aggregation. In *Proceedings of EuroGP 2024*. Lecture Notes in Computer Science, vol 14631. Springer, Cham.

Helmuth, T., Pantridge, E., Frazier, J.G., and Spector, L. 2024. Generational Computation Reduction in Informal Counterexample-Driven Genetic Programming. In *Proceedings of EuroGP 2024*. Lecture Notes in Computer Science, vol 14631. Springer, Cham.

Ding, L., E. Pantridge, and L. Spector. 2023. Probabilistic Lexicase Selection. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '23)*. Association for Computing Machinery, New York, NY, USA, 10731081.

Boldi, R., and L. Spector. 2023. Can the Problem-Solving Benefits of Quality Diversity be Obtained Without Explicit Diversity Maintenance? In *Genetic and Evolutionary Computation Conference Companion (GECCO-2023 Companion)*. Association for Computing Machinery, New York, NY, USA, 21522156. https://doi.org/10.1145/3583133.3596336

Boldi, R., T. Helmuth, and L. Spector. 2022. The environmental discontinuity hypothesis for down-sampled lexicase selection. In the *Why it didn't work-shop* at *ALIFE 2022: The 2022 Conference on Artificial Life*. Posted at `https://arxiv.org/pdf/2205.15931.pdf`

Pantridge, E., T. Helmuth, and L. Spector. 2022. Functional code building genetic programming. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '22)*, pp. 1000–1008. Published by the Association for Computing Machinery.

Ding, L., and L. Spector. 2022. Evolutionary quantum architecture search for parametrized quantum circuits. In *GECCO '22: Proceedings of the Genetic and Evolutionary Computation Conference Companion*, pp. 2190–2195. Published by the Association for Computing Machinery.

Ding, L., R. Boldi, T. Helmuth, and L. Spector. 2022. Lexicase selection at scale. In *GECCO '22: Proceedings of the Genetic and Evolutionary Computation Conference Companion*, pp. 2054–2062. Published by the Association for Computing Machinery.

Ding, L., and L. Spector. 2022. Optimizing Neural Networks with Gradient Lexicase Selection. In *The Tenth International Conference on Learning Representations* (ICLR 2022). Published at openreview.net: `https://openreview.net/pdf?id=J_2xNmVcY4`

Ding, L., and L. Spector. 2021. Evolving neural selection with adaptive regularization. In *Proceedings of GECCO 2021 Companion*, pp. 1717-1725. Genetic and Evolutionary Computation Conference (GECCO '22). Published by the Association for Computing Machinery.

Helmuth, T., E. Pantridge, G. Woolson, and L. Spector. 2020. Genetic Source Sensitivity and Transfer Learning in Genetic Programming. In *Artificial Life Conference Proceedings*, pp. 303–311. MIT Press.

Helmuth, T., and Spector, L. 2020. Explaining and Exploiting the Advantages of Down-sampled Lexicase Selection. In *Artificial Life Conference Proceedings*, pp. 341-349. MIT Press.

Pantridge, E., and L. Spector. 2020. Code Building Genetic Programming. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '20)*, pp. 994–1002. Published by the Association for Computing Machinery.

Saini, A. K., and L. Spector. 2020. Effect of Parent Selection Methods on Modularity. In *EuroGP 2020: Proceedings of the 23rd European Conference on Genetic Programming*, pp. 184-194. Springer Verlag.
Winner, Best Paper Award

Aenugu, S., and Spector, L. 2019. Lexicase selection in learning classifier systems. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '19)*, pp. 356-364. Published by the Association for Computing Machinery.

Helmuth, T., Pantridge, E., and Spector, L. 2019. Lexicase selection of specialists. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '19)*, pp. 1030-1038. Published by the Association for Computing Machinery.
Winner, Best Paper Award, Genetic Programming Track

Saini, A. K., and Spector, L. 2019. Modularity metrics for genetic programming. In *Proceedings of GECCO 2019 Companion*, pp. 2056-2059. Genetic and Evolutionary Computation Conference (GECCO '19). Published by the Association for Computing Machinery.

Helmuth, T., N. F. McPhee, and L. Spector. 2018. Program Synthesis using Uniform Mutation by Addition and Deletion. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '18)*. Published by the Association for Computing Machinery.
Winner, Best Paper Award, Genetic Programming Track

La Cava, W., S. Silva, K. Danai, L. Vanneschi, J. H. Moore, and L. Spector. 2018. A multidimensional genetic programming approach for identifying epistatic gene interactions. In *Proceedings of GECCO 18 Companion*. Genetic and Evolutionary Computation Conference, Kyoto, Japan. Published by the Association for Computing Machinery.

Pantridge, E. R., T. Helmuth, N. F. McPhee, and L. Spector. 2018. Specialization and Elitism in Lexicase and Tournament Selection. In *Proceedings of GECCO 18 Companion*. Genetic and Evolutionary Computation Conference, Kyoto, Japan. Published by the Association for Computing Machinery.

Pantridge, E. R., and L. Spector. 2018. Plushi: An Embeddable, Language Agnostic, Push Interpreter. In *Proceedings of GECCO 18 Companion*. Genetic and Evolutionary Computation Conference, Kyoto, Japan. Published by the Association for Computing Machinery.

Helmuth, T., N. F. McPhee, E. Pantridge and L. Spector. 2017. Improving generalization of evolved programs through automatic simplification. In *Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '17)*. ACM, New York, NY, USA, 937-944. DOI: https://doi.org/10.1145/3071178.3071330
Nominated, Best Paper Award, Genetic Programming Track

Pantridge, E., T. Helmuth, N. F. McPhee, L. Spector. 2017. On the Difficulty of Benchmarking Inductive Program Synthesis Methods. In *Proceedings of GECCO 17 Companion*, Berlin, Germany. DOI: http://dx.doi.org/10.1145/3067695.3082533

Spector, L. and E. Moscovici. 2017. Recent Developments in Autoconstructive Evolution. Extended abstract for invited presentation. In *Proceedings of GECCO 17 Companion*, Berlin, Germany. DOI: http://dx.doi.org/10.1145/3067695.3082058

Pantridge, E. and L. Spector. 2017. PyshGP: PushGP in Python. In *Proceedings of GECCO 17 Companion*, Berlin, Germany. DOI: http://dx.doi.org/10.1145/3067695.3082468

La Cava, W., S. Silva, L. Vanneschi, L. Spector, and J. Moore. 2017. Genetic Programming Representations for Multi-dimensional Feature Learning in Biomedical Classification. In *Applications of Evolutionary Computation. EvoApplications 2017.* Lecture Notes in Computer Science, Vol. 10199. Springer.

Helmuth, T., N. F. McPhee, and L. Spector. 2016. The Impact of Hyperselection on Lexicase Selection. In *Proceedings of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16.* ACM Press. pp. 717–724.
Nominated, Best Paper Award, Genetic Programming Track

La Cava, W., L. Spector, and K. Danai. 2016. Epsilon-lexicase Selection for Regression. In *Proceedings of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16.* ACM Press. pp. 741–748.

Pantridge, E., and L. Spector. 2016. Evolution of Layer Based Neural Networks: Preliminary Report. In *Companion Publication of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16 Companion.* ACM Press. pp. 1015–1022..

Helmuth, T., N. F. McPhee, and L. Spector. 2016. Effects of Lexicase and Tournament Selection on Diversity Recovery and Maintenance. In *Companion Publication of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16 Companion.* ACM Press. pp. 993–990.

Spector, L., N. F. McPhee, T. Helmuth, M. M. Casale, and J. Oks. 2016. Evolution Evolves with Autoconstruction. In *Companion Publication of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16 Companion.* ACM Press. pp 1349–1356.

McPhee, N. F., M. M. Casale, M. Finzel, T. Helmuth, and L. Spector. 2016. Visualizing Genetic Programming Ancestries. In *Companion Publication of the 2016 Genetic and Evolutionary Computation Conference, GECCO'16 Companion.* ACM Press. pp. 1419–1426.

Spector, L.. Work in Progress on Autoconstructive Evolution (Extended Abstract). 2016. In *Proceedings of the 6th International Conference on Metaheuristics and nature inspired computing, META'2016.* Marrakech, Morocco.

La Cava, W., K. Danai, L. Spector, P. Fleming, M. A. Lackner, and A. Wright. 2015 Automatic Identification of Closed-loop Wind Turbine Dynamics via Genetic Programming. In *Proceedings of the ASME 2015 Dynamic Systems and Control Conference.*

La Cava, W., T. Helmuth, L. Spector, and K. Danai. 2015. Genetic Programming with Epigenetic Local Search. In *Proceedings of the 2015 Genetic and Evolutionary Computation Conference, GECCO'15.* ACM Press. pp. 1055–1062.
Nominated, Best Paper Award, Genetic Programming Track.

Helmuth, T., and L. Spector. 2015. General Program Synthesis Benchmark Suite. In *Proceedings of the 2015 Genetic and Evolutionary Computation Conference, GECCO'15.* ACM Press. pp. 1039–1046.

Liskowski, P., K. Krawiec, T. Helmuth, and L. Spector. 2015. Comparison of Semantic-aware Selection Methods in Genetic Programming. In *Companion Publication of the 2015 Genetic and Evolutionary Computation Conference, GECCO'15 Companion.* ACM Press. pp. 1301–1307.

Helmuth, T., and L. Spector. 2014. Word Count as a Traditional Programming Benchmark Problem for Genetic Programming. In *Proceedings of the 2014 Genetic and Evolutionary Computation Conference, GECCO'14*. ACM Press. pp. 919–926.

Trujillo, L., L. Spector, E. Naredo, and Y. Martinez. 2013. A behavior-based analysis of modal problems. In *Companion Publication of the 2013 Genetic and Evolutionary Computation Conference, GECCO'13 Companion.* ACM Press. pp. 1047–1054.

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Robinson, A., and L. Spector. 2002. Using Genetic Programming with Multiple Data Types and Automatic Modularization to Evolve Decentralized and Coordinated Navigation in Multi-Agent Systems. In *Late-Breaking Papers of GECCO-2002, the Genetic and Evolutionary Computation Conference.* Published by the International Society for Genetic and Evolutionary Computation.

Spector, L., R. Moore, and A. Robinson. 2001. Virtual Quidditch: A Challenge Problem for

Automatically Programmed Software Agents. In E.D. Goodman, editor, *Late-Breaking Papers of GECCO-2001, the Genetic and Evolutionary Computation Conference*. Published by the International Society for Genetic and Evolutionary Computation.

Barnum, H., H. J. Bernstein, and L. Spector. 2000. Quantum circuits for OR and AND of OR's. Technical Report CSTR-00-014, Dept. of Computer Science, University of Bristol, August 2000.

Spector, L, H. Barnum, H.J. Bernstein, and N. Swamy. 1999. Abstract for Invited Presentation: Quantum Computing and AI. In *Proceedings of the Sixteenth National Conference on Artificial Intelligence, AAAI-99*, AAAI Press.

Barnum, H., Bernstein, H. J., and Spector, L. 1999. Better-than-classical Circuits for OR and AND/OR Found Using Genetic Programming. Los Alamos Preprint Archive, http://xxx.lanl.gov/abs/quant-ph/9907056

Luke, S., and L. Spector. 1996. Evolving Graphs and Networks with Edge Encoding: Preliminary Report. In Koza, John R. (editor), *Late-Breaking Papers at the Genetic Programming 1996 Conference.* Palo Alto, CA: Stanford Bookstore (ISBN 0-18-201-031-7).

Spector, L. 1992. Supervenience in Dynamic-World Planning, Doctoral dissertation. CS-TR-2899, UMIACS-TR-92-55, Department of Computer Science, University of Maryland.

Spector, L., B. Andersen, J. Hendler, B. Kettler, E. Schwartzman, C. Woods, and M. Evett. 1992. Knowledge Representation in PARKA – Part 2: Experiments, Analysis, and Enhancements. CS-TR-2837, UMIACS-TR-92-16, Department of Computer Science, University of Maryland.

Spector, L. and J. Hendler. 1990. Knowledge Strata: Reactive Planning with a Multi-level Architecture. UMIACS-TR-90-140, CS-TR-2564, Department of Computer Science, University of Maryland.

Spector, L., J. Hendler, and M. Evett. 1990. Knowledge Representation in PARKA. UMIACS-TR-90-23, CS-TR-2410, Department of Computer Science, University of Maryland.

Evett, M., J. Hendler, and L. Spector. 1990. PARKA: Parallel Knowledge Representation on the Connection Machine. UMIACS-TR-90-22, CS-TR-2409, Department of Computer Science, University of Maryland.

Spector, L., J. Hendler, J. Canning, and A. Rosenfeld. 1988. Symbolic Model/Image Matching in Expert Vision Systems. CAR-TR-370, CS-TR-2060, University of Maryland Center for Automation Research.

Newspaper Op-Ed

And now, digital evolution. In *The Boston Globe*, August 29, 2005.

Letters to the Editor

Letter to the editor, *The Daily Hampshire Gazette*, regarding local taxes, May 30, 2009.

Letter to the editor, *The Daily Hampshire Gazette*, regarding funding for public education, May 19, 2006.

Letter to the editor, *New York Times*, regarding warrantless surveillance, March 10, 2006.

Letter to the editor, *Scientific American*, regarding nanobots, January, 2002.

Letter to the editor, *Circuits* section, *New York Times*, regarding robotic pets, May 11, 2000.

Letter to the editor, *IEEE Intelligent Systems*, regarding quantum computing, September/October, 1999.

Presentations

(in addition to those for conference/workshop papers and posters listed above)

AI in the Liberal Arts: The Liberal Arts Mission in a World with AI. Conference of Board Chairs meeting. February 2, 2026.

Artificial Intelligence: Ideas, Promise, and Peril. Applewood Independent Living. December 6, 2025.

Evolution, Computation, Art. In Niko Vicarios Amherst College course on Art and Technology since 1960. November 11, 2025.

Opening Plenary: Critical Inquiry in an Age of Instant Answers. With Arianna King and Alex Helberg. AI and the Liberal Arts Symposium, October 16, 2025.

AI: What It Is Now, Where Its Going, and What It Means. Amherst College Class of 1973 "73inConversation" presentation, online. September 18, 2025.

Living with AI: The Future of Man and Machine. Universidad Cooperativa de Colombia, Ibagué. Remote panel discussion with Eric Swanson, Alexandria Tsalidis, and Lee Spector, moderated by Lucy Brock. April 30, 2025.

Particularity. Presentation for Possible Futures: AI and Human Experience, Kahn Liberal Arts Institute, Smith College. April 22, 2025.

Artificial Intelligence: A personal history and vision, told through books. Keynote for the 2025 AI in the Liberal Arts Undergraduate Conference. April 19, 2025.

A.I., Amherst and American Education. Panel discussion with Brian House, facilitated by James Warren. Amherst College. May 31, 2024.

Artificial Intelligence: A personal history and vision, told through books. Keynote for the 2024 AI in the Liberal Arts Undergraduate Conference. April 20, 2024.

Creativity in Adaptation: How evolution can transform machine learning. Cedars-Sinai Computational Biomedicine Symposium. December 14, 2023.

Evolution of Quantum Algorithms. Quantum Algorithm Design Automation Workshop, IEEE Quantum Week. September 22, 2023.

ChatGPT in Education: Boon, Bane and Beyond. Panel discussion with Kristina Reardon and Christopher Grobe, facilitated by Jaya Kannan and Riley Caldwell-O'Keefe. Academic Technology Services and Center for Teaching and Learning, Amherst College. February 20, 2023.

Honor All the Things: A Lexicase Selection Manifesto. Keynote presentation. The 10th International Workshop on Numerical and Evolutionary Optimization (NEO X). November 9, 2022.

Honor All the Things: The case against aggregating objectives in AI and maybe everything else.

Faculty Colloquium. Amherst College, September 23, 2022.

A Conversation with John Koza. Interview and panel discussion with John Koza, Erik Goodman, Wolfgang Banzhaf, and Kalyanmoy Deb. *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2022.

Push. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2021. Slides published in *GECCO '21 Companion*, by the Association for Computing Machinery.

Information Theory. *Science on Screen* presentation in conjunction with a screening of *The Bit Player*, a film about Claude Shannon, at Amherst Cinema, March 23, 2021.

Genetic Programming with Autoconstructive Evolution. Guest lecture in Thomas Helmuth's *Topics in Computer Science II* course. Hamilton College, November 11, 2020.

Push. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2020. Slides published in *GECCO '20 Companion*, by the Association for Computing Machinery.

Evolutionary Computation. Computer Science Seminar, Union College, March 6, 2020.

Evolutionary Computation. Computer Science Colloquium. Amherst College, November 4, 2019.

Push. With N. F. McPhee. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2019. Slides published in *GECCO '19 Companion*, by the Association for Computing Machinery.

Expressive Genetic Programming: Concepts and Applications. With N. F. McPhee. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2018. Slides published in *GECCO '18 Companion*, by the Association for Computing Machinery.

Life and Death, Artificial and Real. Guest lecture in Daniel Altshuler's and Pamela Stone's *Life and Death* course. Hampshire College, April 5, 2018.

Genetic Programming with Autoconstructive Evolution. MIT Computational Cognitive Science Group. November 17, 2017.

Evolving evolution, in computers, to solve some of the world's hardest problems. School of Cognitive Science, Hampshire College, September 27, 2017.

Expressive Genetic Programming: Concepts and Applications. With N. F. McPhee. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2017. Slides published in *GECCO '17 Companion*, http://dx.doi.org/10.1145/3067695.3067699

Expressive Genetic Programming: Concepts and Applications. With N. F. McPhee. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2016.

Artificial Intelligence, Evolutionary Computation, and Autoconstructive Evolution. Guest lecture for the Honors Colloquium class visiting from Holyoke Community College, at Hampshire College, April 8, 2016.

Autoconstructive Evolution. School of Cognitive Science, Hampshire College, March 2, 2016.

Genetic Programming in Clojure. Presentation at Clojure/Conj, Philadelphia, PA, November 17, 2015.

Automatic Programming via Evolution. Invited presentation, *Complex Systems Digital Campus 15: World e-Conference*, organized by the Complex Systems Digital Campus (CS-DC), a UNESCO UniTwin, September 30, 2015.

Automatic Programming via Evolution. School of Cognitive Science, Hampshire College, September 30, 2015.

The Future of AI. Interview, *The Technoskeptic* podcast (`thetechnoskeptic.com`), July 15, 2015.

Expressive Genetic Programming. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2015.

Solving Uncompromising Problems with Lexicase Selection. Presentation for the "Hot Off the Press" track, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2015.

The possibility of developing an artificial brain, and what the development of artificial people means both for them and for us. *Science on Screen* presentation in conjunction with a screening of *Blade Runner* at Amherst Cinema, May 6, 2015.

The Future of Genetic Programming. Guest lecture. Mount Holyoke College, April 15, 2015.

Evolution of Expressive Programs: Principles, Products, and Prospects. Keynote presentation, BEACON Congress, BEACON (An NSF Center for the Study of Evolution in Action), Michigan State University, August 18, 2014.

Expressive Program Evolution. Invited presentation, Computer Science Department and Molecular and Cellular Biology Program, Dartmouth College, July 28, 2014.

Expressive Genetic Programming. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2014.

Steps toward the evolution of arbitrary software. Presentation at *Genetic Programming Theory and Practice Workshop*, with Thomas Helmuth, University of Michigan, Ann Arbor, May 9, 2014.

The Calculator Problem and the Evolutionary Synthesis of Arbitrary Software. Invited presentation, *The 28th CREST Open Workshop: Genetic Programming for Software Engineering*, University College London, October 14, 2013.

Quantum Computing. Guest lecture in Jaime Davila's *Privacy in the Age of the Internet* class. Hampshire College, March 4, 2014.

Expressive Genetic Programming. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2013.

Expressive Genetic Programming. Tutorial, *12th International Conference on Parallel Problem Solving From Nature (PPSN)*, September, 2012.

Expressive Genetic Programming. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2012.

The Evolution of Identity and Modularity in Nature and Computation. Invited presentation, Neuroscience Department, Oberlin College, March 16, 2012.

3D Models. Guest lecture for Keith Downing's modeling seminar, Oberlin College, March 16, 2012.

Genomes as Reactive Systems: A Computational Perspective. Guest lecture in *Frontiers in Biomathematics*. Smith College, March 14, 2012.

Biologically-Inspired Evolution of Computer Programs: Tag-based Modularity in Genetic Programming. Guest lecture in Hava Siegelmann's *Computational Social Neuroscience* seminar. University of Massachusetts, Amherst, February 29, 2012.

Other Minds Produced by Computational Evolution. Two guest lectures in Laura Sizer's *Other Minds* course, Hampshire College, October 26 and 31, 2011.

Evolving Quantum Computer Algorithms. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2011.

Biologically-Inspired Evolution of Computer Programs: Tag-based Modularity in Genetic Programming. Guest lecture in Hava Siegelmann's *Introduction to Modern Computational Neuroscience* seminar. University of Massachusetts, Amherst, April 22, 2011.

Biologically-Inspired Evolution of Computer Programs: Tag-based Modularity in Genetic Programming. School of Cognitive Science, Hampshire College, March 2, 2011.

Other Minds Produced by Computational Evolution. Two guest lectures in Laura Sizer's *Other Minds* course, Hampshire College, November 15 and 17, 2010.

Expressive Languages for Evolved Programs and Autoconstructive Evolution. Invited presentation, CSE Department and BEACON Center, Michigan State University, November 12, 2010.

Evolving the Future of Mathematics. "Prime Time" presentation for *Hampshire College Summer Studies in Mathematics*, Hampshire College, August 12, 2010.

Evolution of Quantum Algorithms. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2010.

Hampshire on the Technological Cutting Edge *and* Computational Intelligence at Hampshire. Presentations at the *Hampshire College 40th Anniversary* celebration, June, 2010.

From Bits to Brains that Make and Appreciate Art. *Art on the Brain* conference, Mount Holyoke College, June, 2010.

Computer Science, Cognitive Science, and Artificial Life at Hampshire. Accepted student's day presentation, Hampshire College, April, 2010.

Expressive Languages for Evolved Programs. Machine Learning and Friends Lunch presentation. University of Massachusetts, Amherst, November 12, 2009.

Evolving Quantum Computer Algorithms. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July, 2009.

Trivial Geography and Historically-Assessed Hardness: Two simple techniques for enhancing the problem-solving power of genetic programming. University of Tokyo, Japan, June 24, 2009.

Quantum Computing and Evolutionary Computation. Tutorial, *World Summit on Genetic and Evolutionary Computation*, Shanghai, China, June 13, 2009.

Comments on Douglas Saddy's "Perceiving and Processing Recursion in Formal Grammars."

Recursion: Structural Complexity in Language and Cognition conference, University of Massachusetts, Amherst, May 28, 2009.

The Computational Creativity Curriculum. National Science Foundation CreativeIT Principal Investigators meeting, January 15, 2009.

Past and Future Origins of Artificial Life. School of Cognitive Science, Hampshire College, November 19, 2008.

Examples for the Aesthetics of Data Workshop. *Aesthetics of Data and its Analysis* workshop, Kahn Liberal Arts Institute, Smith College, October 18, 2008.

Darwin Machines for Science and Art. Hampshire College event for trustees, alumni and prospective students, September 25, 2008.

Genetic Programming for Finite Algebras. "Prime Time" presentation for *Hampshire College Summer Studies in Mathematics*, Hampshire College, July 29, 2008.

Quantum Computing. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, June, 2008.

Climate Change and Complex Adaptive Systems. *Focus Hampshire*, a climate change teach-in, Hampshire College, March 7, 2008.

Evolution, the Programmer and Mathematician. School of Cognitive Science, Hampshire College, February 20, 2008.

Advanced Computing in a Complex World. Vermont Advanced Computing Center, University of Vermont, January, 2008.

The Computational Creativity Curriculum. School of Cognitive Science, Hampshire College, October, 2007.

Quantum Computing. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, June, 2007.

Intelligence Evolving. Invited presentation. *Oberlin Club of Western New England*, Northampton, Massachusetts, May 6, 2007.

Evolutionary Computation for Science, Engineering and Art. Invited presentation. *School of Science & Engineering Colloquium Series*, State University of New York at New Paltz, April 26, 2007.

Algorithmic Art. Invited presentation. Hampshire College course on *Topics in Computer Graphic Animation Arts*, taught by Eric Wilson, March 13, 2005.

Strange Bits: Quantum Computing and the Search for New Quantum Algorithms. Invited Presentation. *Sigma Xi* Scientific Research Society, Swarthmore College Chapter, January 30, 2007.

Cooperation and Computational Evolution. *The Grey Thumb Society*, Cambridge, MA, December 4, 2006.

Division Blocks. School of Cognitive Science, Hampshire College, October 12, 2006.

Quantum Computing. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, June, 2006.

Evolution of Irreducible Complexity by Natural Selection. *Evolution, Science, and Intelligent Design: A Panel Discussion*, Hampshire College, February 8, 2006.

Guest presentations on topics in science and math at Bridge Street Elementary School, Northampton MA. Topics included robotics, physics of sound, fractals, logo programming, binary, light and spectroscopy, planetary orbits, the Krypto math game, insects and swarm intelligence, digital microscopy, and the fourth dimension.

Algorithmic Arts. *Art and Technology Retreat*, Hampshire College, January 27, 2006.

The Chomsky Hierarchy. Invited presentation. Hampshire College course on *Human Nature, Language, and Politics: Noam Chomsky and His Critics*, taught by Ernie Alleva and Steve Weisler, December 5, 2005.

Quantum Computing. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, June, 2005.

The Evolution of Arbitrary Computational Processes. Invited presentation. Department of Computer Science, University of Maryland, College Park, March 7, 2005.

Automated Invention by Means of Genetic Programming. Tutorial, with John Koza, *Nineteenth National Conference on Artificial Intelligence, AAAI-04*, July 25, 2004.

Quantum Computing. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July 13, 2003.

Quantum Computing for Genetic Programmers. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July 9, 2002.

Quantum Computing and Artificial Intelligence. Chevron TechNet Advanced Information-Based Modeling seminar series. November 12, 1999.

Quantum Computing and AI. Invited Presentation, *Sixteenth National Conference on Artificial Intelligence, AAAI-99*, 1999.

Quantum Computation. Tutorial, *Genetic and Evolutionary Computation Conference (GECCO)*, July 14, 1999.

Genetic Programming of Intelligent Agents and Artists. Invited lecture. Swarthmore College Cognitive Science Colloquium Series. 1996.

Genetic Programming of Cognitive Models. Invited presentation. Cognitive Neuroscience Unit, National Institute of Neurological Disorders and Stroke, National Institutes of Health. 1996.

Automatic Generation of Planning Systems. Georgia Institute of Technology. 1996.

Artificial Intelligence as the Liberal Arts of Computer Science. Cognitive Science Brown Bag Lunch Presentation, Georgia Institute of Technology. 1996.

Exploring the Internet. Science Education Partnership , Hampshire College. 1994.

What Computers Can't Do. Guest lecture. Smith College. 1993.

Representations and Processes in Human Prefrontal Cortex: Convergence of Cognitive Neuroscience, Cognitive Science, and Artificial Intelligence Research. Panel presentation. Thirteenth Annual Conference of the Cognitive Science Society. 1991.

PARKA: Knowledge Representation on the Connection Machine. Panel presentation. Workshop on Term Subsumption Languages in Knowledge Representation. 1989.

Grants and Awards

ACM SIGEVO Impact Award, recognizing "General Program Synthesis Benchmark Suite" by Helmuth and Spector as the most impactful paper from GECCO 2015. Awarded 2025.

ACM SIGEVO Outstanding Contribution Award. 2023.

Master of Arts degree (honorary), Amherst College, 2022.

National Science Foundation, Division Of Computer and Network Systems. MRI: Acquisition of High Performance Computing System for Interdisciplinary Research and Teaching. PIs: A. Wagaman and L. Spector. $500,000. 2021–2024.

Best Paper Award, 23rd European Conference on Genetic Programming (EuroGP 2020).

Best Paper Award, Genetic and Evolutionary Computation Conference (GECCO-2019), Genetic Programming Track.

Best Paper Award, Genetic and Evolutionary Computation Conference (GECCO-2018), Genetic Programming Track.

National Science Foundation, Division of Information and Intelligent Systems, Directorate for Computer and Information Science and Engineering, Robust Intelligence program. RI: Small: RUI: Synthesis of Robust Artificial Systems by Adaptive Genetic Programming. PI: L. Spector. $418,897. 2016–2019.

Google, CS Engagement Award. Programming for Science. $5,000. 2015.

National Science Foundation, Division of Computing and Communication Foundations. Human-Competitive Evolutionary Computation. Co-Principal Investigators: L. Spector and M. Sipper. $42,000. 2013–2016.

National Science Foundation, Division of Biological Infrastructure, Interdisciplinary Training in Biology and Mathematics. UBM-Institutional-Collaborative Research: Four College Biomath Consortium. Co-Principal Investigators: L. Spector and S. Hews. $181,159. 2011–2016.

National Science Foundation, Division of Information and Intelligent Systems. RUI: Evolution of Robustly Intelligent Computational Systems. $423,288. 2010–2015.

Sherman Fairchild Foundation, Design, Art, and Technology: Innovation Synergy. Grant to Hampshire College; Ellen Donkin and Lee Spector, Co-Directors. $300,000. 2009–2012.

Gold medal, GECCO-2008 Human-Competitive Results competition. With David M. Clark, Ian Lindsay, Bradford Barr, and Jon Klein. $5,000. 2008.

National Science Foundation, CreativeIT program. The Computational Creativity Curriculum. Co-Principal Investigators: J. Davila, C. Perry. $49,641. 2008–2009.

Elected *Fellow*, International Society for Genetic and Evolutionary Computation. 2004.

Gold medal, GECCO-2004 Human-Competitive Results competition. With Herbert J. Bernstein and Howard Barnum. $1,500. 2004.

National Science Foundation, Director's Award for Distinguished Teaching Scholars. Open-Ended Evolution in Visually Rich Virtual Worlds: Implementation, Analysis, and Use in Undergraduate Education. $300,000. 2003–2007.

Best Paper Award, Genetic and Evolutionary Computation Conference (GECCO-2003), AAAA Track (A-Life, Adaptive Behavior, Agents, and Ant Colony Optimization).

National Science Foundation, Major Research Instrumentation program and Research in Undergraduate Institutions program. Acquisition of Instrumentation for Research in Genetic Programming, Quantum Computation, and Distributed Systems. $99,751. 2002–2005.

Defense Advanced Research Projects Agency (DARPA) program on Agent Based Computing. Multi-type, Self-adaptive Genetic Programming for Complex Applications. $295,936. 2001–2004.

Hampshire College support for the Institute for Computational Intelligence.

MacArthur Chair at Hampshire College. $45,000. 1997–2000.

National Science Foundation, Learning and Intelligent Systems Program. Inquiry-Based Science Education: Cognitive Measures and Systems Support. Co-Principal Investigators: N. Stillings, L. Spector, S. Weisler, L. Winship, and B. Woolf. $1,100,000. 1997.

Lemelson National Program in Invention, Innovation and Creativity. Applications of Evolved Complex Dynamic Systems. With Mark Feinstein. $3,000. 1997.

Lemelson National Program in Invention, Innovation and Creativity. Enhancing the human/computer interface: video-based movement analysis. With Slavoljub Milekic and Mark Feinstein. $6,200. 1996.

Hewlett-Mellon Faculty Development Grant. Intelligent Real-time Music Processing. $700. 1996.

Hewlett-Mellon Faculty Development Grant. Evolutionary Computation and the Arts. $1,500. 1995.

Lemelson National Program in Invention, Innovation and Creativity. MIDI/Motion Device, Demonstration and Enhancement. $2,500. 1995.

Hewlett-Mellon Faculty Development Grant. The Virtual Student Union. $1,500. 1994.

Lemelson National Program in Invention, Innovation and Creativity. Travel grant for AAAI-94. $1,000. 1994.

Lemelson National Program in Invention, Innovation and Creativity. Grant for the establishment of the Creative Cognition Laboratory. $15,000. 1993.

Service

Professional Conference Program Committees

Genetic and Evolutionary Computation Conference, GECCO-2026
Workshop program co-chair
Genetic and Evolutionary Computation Conference, GECCO-2025

Workshop on Quantum Optimization at GECCO-2025
Genetic and Evolutionary Computation Conference, GECCO-2024
Workshop on Quantum Optimization at GECCO-2024
European Conference on Genetic Programming, EuroGP-2024
38th AAAI Conference on Artificial Intelligence, AAAI-2024
Senior program committee
Genetic and Evolutionary Computation Conference, GECCO-2023
Workshop on Quantum Optimization at GECCO-2023
European Conference on Genetic Programming, EuroGP-2023
Genetic and Evolutionary Computation Conference, GECCO-2022
Workshop on Quantum Optimization at GECCO-2022
European Conference on Genetic Programming, EuroGP-2022
36th AAAI Conference on Artificial Intelligence, AAAI-2022
Senior program committee
Genetic and Evolutionary Computation Conference, GECCO-2021
35th AAAI Conference on Artificial Intelligence, AAAI-2021
Senior program committee
European Conference on Genetic Programming, EuroGP-2021
Artificial Life Conferece, ALife2020
Genetic and Evolutionary Computation Conference, GECCO-2020
European Conference on Genetic Programming, EuroGP-2020
Genetic and Evolutionary Computation Conference, GECCO-2019
European Conference on Genetic Programming, EuroGP-2019
Genetic and Evolutionary Computation Conference, GECCO-2018
European Conference on Genetic Programming, EuroGP-2018
Genetic and Evolutionary Computation Conference, GECCO-2017
European Conference on Genetic Programming, EuroGP-2017
Genetic and Evolutionary Computation Conference, GECCO-2016
Genetic and Evolutionary Computation Conference, GECCO-2015
European Conference on Genetic Programming, EuroGP-2015
The 6th annual Symposium on Search-Based Software Engineering, SSBSE-2014
The 14th International Conference on the Synthesis and Simulation of Living Systems, ALIFE-14
Genetic and Evolutionary Computation Conference, GECCO-2014
European Conference on Genetic Programming, EuroGP-2014
Genetic and Evolutionary Computation Conference, GECCO-2013
European Conference on Genetic Programming, EuroGP-2013
Genetic and Evolutionary Computation Conference, GECCO-2012
European Conference on Genetic Programming, EuroGP-2012
Genetic and Evolutionary Computation Conference, GECCO-2011:
Co-chair, genetic programming track
European Conference on Genetic Programming, EuroGP-2011
Genetic and Evolutionary Computation Conference, GECCO-2008
Genetic and Evolutionary Computation Conference, GECCO-2006
Fourth European Workshop on Evolutionary Music and Art, EvoMUSART-2006
IEEE Computational Intelligence and Games, CIG-2005
Third European Workshop on Evolutionary Music and Art, EvoMUSART-2005
AAAI 2004 Fall Symposium on Artificial Multi-Agent Learning Genetic and Evolutionary Computation Conference, GECCO-2004:
Chair, genetic programming track
Judge, TinyGP competition
European Conference on Artificial Intelligence, ECAI 2004
Genetic and Evolutionary Computation Conference, GECCO-2003
Genetic and Evolutionary Computation Conference, GECCO-2001:
Proceedings Editor-in-Chief

Genetic and Evolutionary Computation Conference, GECCO-2000:
Chair, genetic programming and evolvable hardware tracks
Sixteenth National Conference on Artificial Intelligence, AAAI-99:
Senior program committee
Fifteenth National Conference on Artificial Intelligence, AAAI-98
Third International Conference on Genetic Programming, GP-98
Thirteenth National Conference on Artificial Intelligence, AAAI-96
First International Conference on Genetic Programming, GP-96
Genetic Programming Track, IEEE Intl. Conference on Evolutionary Computation, ICEC-96
Florida Artificial Intelligence Research Society (FLAIRS) conference

Additional Reviewing

Adaptive Behavior (journal)
Advances in Genetic Programming 2 (MIT Press)
Artificial Intelligence (journal)
Artificial Life (journal)
BioSystems (journal)
Computational Intelligence (journal)
Design Automation Conference, 2004, Ph.D. Forum
Evolutionary Computation (journal)
Genetic Programming and Evolvable Machines (journal)
Genetic Programming: Theory and Practice (Kluwer Academic Publishers)
IEEE Computational Intelligence Magazine
IEEE Transactions on Evolutionary Computation (journal)
IEEE Transactions on Systems, Man, and Cybernetics—Part C: Applications and Reviews (journal)
Journal of Experimental and Theoretical Artificial Intelligence (journal)
The Marsden Fund (The Royal Society of New Zealand)
National Science Centre Poland
National Science Foundation Distinguished Teaching Scholars Panel
National Science Foundation Instrumentation and Laboratory Improvement Review Panel
National Science Foundation Robust Intelligence Panel
National Science Foundation Graduate Research Fellowship Program
Natural Sciences and Engineering Research Council of Canada
Nederlandse Organisatie voor Wetenschappelijk Onderzoek (The Netherlands)
The Netherlands Organisation for Scientific Research (NWO), council for physical sciences
Nature Reviews Genetics (journal)
Physical Review Letters (journal)
PLOS Computational Biology (journal)
Royal Society Interface (journal)
Science Foundation Ireland
Sherman Fairchild Foundation (Arts and Technology program site visits)
Trends in Ecology and Evolution (journal)
UK Engineering and Physical Sciences Research Council

Additional Service

Amherst College initiative on AI in the Liberal Arts, Director
Amherst College Faculty Committee on Research Awards
Amherst College AI & Sustainability Hackathon judge
Hampshire College Strategic Plan Implementation Planning Group
Hampshire College Design, Art and Technology Program (co-director)
Hampshire College Governance Task Force

Hampshire College Creativity Center Steering Committee
Five College Logic Certificate Program (Hampshire representative)
Five College Biomathematics Consortium Steering Committee
Hampshire College Making of the College 2.0 Oversight Committee (co-chair)
Hampshire College Wabash Study Task Force
Faculty representative to the Hampshire College Board of Trustees
Hampshire College Educational Policy Committee
Hampshire College Campus Committee on Faculty Reappointments and Promotions
Hampshire College Information Technology Steering Committee
Hampshire College Faculty Compensation Committee
Hampshire College Executive Committee of the Faculty
Hampshire College Task force to examine the granting of graduate degrees (chair)
Hampshire College Search Committee Chair, Asst. Prof. Media Arts and Sciences
Hampshire College Search Committee Chair, Prof. Integrated Science and Humanities
Hampshire College Search Committee Chair, Asst. Prof. Computer Science
Hampshire College Search Committee Chair, Visiting Prof. Computer Science (several instances)
Hampshire College Search Committee Chair, Visiting Prof. Cognitive Science
Hampshire College Search Committee Chair, Asst. Prof. Computer Science & Game Design
Hampshire College Search Committee Chair, Administrative Assistant for Cognitive Science
Hampshire College Search Committee member (several instances)
Science Fair judge, Northampton MA Public Schools
Science and math enrichment activity presenter, Northampton MA Public Schools
Graduate Student Workshop judge, Genetic and Evolutionary Computation Conference
Human-competitive Results Competition judge (several occasions), GECCO Conference

Graduate Student Committee Memberships or Advisorships

Li Ding (Ph.D. student, U. Massachusetts)
Esteban Ricalde González (Ph.D. student, Memorial University of Newfoundland)
Kyle Harrington (Ph.D. student, Brandeis University)
Thomas Helmuth (Ph.D. student, U. Massachusetts)
Karthik Kannappan (M.S. student, U. Massachusetts)
Brian Kettler (Ph.D. student, U. Maryland)
Jon Klein (Ph.D. student, Chalmers U., Sweden)
William La Cava (Ph.D. student, U. Massachusetts)
Tam'si Ley (Ph.D. student, Université de Strasbourg)
Jason Lohn (Ph.D. student, U. Maryland)
Sean Luke (Ph.D. student, U. Maryland)
Blossom Metevier (Ph.D. student, U. Massachusetts)
Eva Moshkovich (M.S. student, U. Massachusetts)
Edward Pantridge (M.S. student, U, Massachusetts)
Dov Pechenick (Ph.D. student, Dartmouth College)
Cara Reedy (Ph.D. student, Rensselaer Polytechnic Institute)
Anil Kumar Saini (Ph.D. student, U. Massachusetts)
Oliver Seeliger (M.S. student, U. Maryland)
Joshua Shinavier (Ph.D. student, Rensselaer Polytechnic Institute)
Cooper Sigrist (Ph.D. student, U. Massachusetts)
Emma Tosch (Ph.D. student, U. Massachusetts)
Terry Van Belle (Ph.D. student, U. New Mexico)

Courses Taught

In chronological order

Fall, 1986 at George Washington University, as a Teaching Assistant:

Computer Science Projects

Fall, 1992 at Hampshire College:
Introduction to Computer Science: Programming Creative Processes
Reasoning about Action

January Term, 1993 at Hampshire College:
Hypertext

Spring, 1993 at Hampshire College:
What Computers Can't Do
Artificial Intelligence

Fall, 1993 at Hampshire College:
Introduction to Computer Science: Programming Creative Processes
Advanced Topics in Artificial Intelligence: Creativity in Reasoned Response

Spring, 1994 at Hampshire College:
What Computers Can't Do
Artificial Intelligence

Fall, 1994 at Hampshire College:
Introduction to Computer Science: Programming Creative Processes
Advanced Topics in Artificial Intelligence

Spring, 1995 at Hampshire College:
Artificial Intelligence Research Laboratory
Animals and Animats (with Mark Feinstein)

Fall, 1996 at Hampshire College:
Computing Concepts: Creative Machines?
Artificial Intelligence

Spring, 1997 at Hampshire College:
The Nature of Mind: An Introduction to Cognitive Science
Seminar in Artificial Intelligence: Evolutionary Computation

Fall, 1997 at Hampshire College:
Computing Concepts: Creative Machines?
Creative Programming Workshop
Visualizing Information: The Population Dilemma (Five College course led by Robert B. Hallock)

Spring, 1998 at Hampshire College and Smith College:
When Machines Talk (at Hampshire College, with Steve Weisler)
Artificial Intelligence (at Hampshire College)
Programming Language Paradigms (at Smith College)

Fall, 1998 at Hampshire College:
Cognitive Science Fiction
Computing Concepts: Creative Machines?

Spring, 1999 at Hampshire College:
Computational Models of Biological Systems (with Michelle Murrain)

Fall, 1999 at Hampshire College:
Cognitive Science Fiction
Seminar in Artificial Intelligence: Evolutionary Computation (with Jaime Davila)

Spring, 2000 at Hampshire College:
Artificial Intelligence

Spring, 2001 at Hampshire College:
Quantum Computing with No Prerequisites of Any Kind
Artificial Intelligence

Fall, 2001 at Hampshire College:
Computing Concepts: Creative Machines?
Seminar in Artificial Intelligence: Evolutionary Computation

Spring, 2002 at Hampshire College:
What Computers Can't Do

Fall, 2003 at Hampshire College:
Current Issues in Cognitive Science

Spring, 2004 at Hampshire College:
Artificial Intelligence

Fall, 2004 at Hampshire College:
Biocomputational Developmental Ecology (with Raymond Coppinger)

Fall, 2006 at Hampshire College:
Computing Concepts: Creative Machines?
Current Issues in Cognitive Science

Spring, 2007 at Hampshire College:
Algorithmic Arts
Artificial Intelligence in 3D Virtual Worlds

Fall, 2007 at Hampshire College:
What Computers Can't Do
Genetic Programming

Spring, 2008 at Hampshire College:
Computing Concepts
Radical Innovation in Digital Arts (with Chris Perry)

Fall, 2008 at Hampshire College:
Cognitive Science Fiction
Artificial Intelligence in 3D Virtual Worlds

Spring, 2009 at Hampshire College:
Computing Concepts
Unconventional Computing

Fall, 2009 at Hampshire College:
Code Immersion
Research Experience in Artificial Intelligence

Spring, 2010 at Hampshire College
Genetic Programming

Fall, 2010 at Hampshire College
Cognitive Science Fiction
Creative Programming Workshop

Spring, 2011 at Hampshire College
Research in Artificial Intelligence

Fall, 2011 at Hampshire College
Genetic Programming
Research Experience in Artificial Intelligence

Fall, 2012 at Hampshire College
Programming Creativity
Genetic Programming

Spring, 2013 at Hampshire College
Research in Artificial Intelligence

Fall, 2013 at Hampshire College
Cognitive Science Fiction
Unconventional Computing

Spring, 2014 at Hampshire College
Genetic Programming

Fall, 2014 at Hampshire College
Programming Creativity
Artificial Intelligence

Spring, 2015 at Hampshire College
What Computers Can't Do

Fall, 2015 at Hampshire College
Artificial Intelligence
Programming for Science

Spring, 2016 at Hampshire College
Evolutionary Computation

Fall, 2017 at Hampshire College
Beginning Coding for Science
Artificial Intelligence

Spring, 2018 at Hampshire College
Frontiers in Biomathematics
Genetic Programming

Fall, 2018 at Hampshire College
Cognitive Science Fiction
Research in Artificial Intelligence

Spring, 2019 at Hampshire College
Programming Game Theory

Fall, 2019 at Amherst College
Introduction to Computer Science I (two sections)

Spring, 2020 at Amherst College
Data Structures
Seminar in Computer Science: Evolutionary Computation

Fall, 2020 at Amherst College
Machine Learning (two sections)

Spring, 2021 at Amherst College
Introduction to Computer Science I (two sections)

Fall, 2021 at Amherst College
Introduction to Computer Science I (two sections)

Spring, 2022 at Amherst College
Introduction to Computer Science I
Seminar in Computer Science: Evolutionary Computation

Fall, 2022 at Amherst College
What Computers Can't Do
Machine Learning

Spring, 2023 at Amherst College
Machine Learning
Seminar in Computer Science: Evolutionary Computation

Fall, 2024 at Amherst College
Data Structures
Seminar in Computer Science: Evolutionary Computation

Spring, 2025 at Amherst College
Data Structures
Machine Learning

Fall, 2025 at Amherst College
What Computers Can't Do

Spring, 2026 at Amherst College
Machine Learning
Seminar in Computer Science: Evolutionary Computation

Independent Study Courses Supervised

Programming in Lisp (Fall, 1993)
Independent Study in Algorithms and Data Structures (Fall, 1993)
Project in Computer Science: Artificial Life E-Team (two students; Spring, 1994)
Computability and Logic (Spring, 1994)
The Hampshire College Virtual Student Union (Fall, 1994)
Project in Computer Science: Linux System Administration (Spring, 1995)
Project in Computer Science: Weeble World III: Weebles Avenged (three students; Spring, 1995)
Data Structures and Algorithms (Fall, 1997)

Artificial Intelligence and Cyborg Theory (Spring, 1998)
Computers, Quilts, and Calculus (Fall, 1998)
Data Structures (Spring, 1999)
Advanced Evolutionary Computing (Spring, 2002)
Parallel Programming (Fall, 2003)
Data Structures (Fall, 2003)
Basic Software Engineering & Interfaces (Fall, 2004)
Discrete Mathematics for Computer Science (Fall, 2004)
Artificial Intelligence (Fall, 2004)
Evolutionary Computation (Spring, 2005)
Lisp Programming (Fall, 2006)
Genetic Programming (Spring, 2007)
Evolution and Thought: An Introduction to Memetics (Spring, 2007)
Introduction to the Python Programming Language (Fall, 2007)
The C and C++ Programming Languages (Fall, 2007)
3D Gravitational Simulations (January Term, 2008)
Java Graphics Programming (January Term, 2008)
Functional Programming (Spring, 2008)
Computer Game Level Design using the Unreal Engine 3 (Fall, 2008)
Java Programming (two students; Spring, 2009)
Working through "Structure and Interpretation of Computer Programs" (two students; Spring, 2009)
Common Lisp and Scheme Programming (Spring, 2009)
Digital Empowerment: Teaching students to conquer the web (Spring, 2009)
Web Application Development with Ruby on Rails (Spring, 2009)
Introduction to Algorithms (Fall, 2009)
Artificial Intelligence and Game Design in Unity 3D (Fall, 2009)
Web Design (Fall, 2009)
Methods of Logic (January Term, 2010)
SAT Solver Research (Spring, 2010)
Exploration and Development of Music Software Technology (Spring, 2010)
Introduction to Algorithms (two students; Spring, 2010)
Using User Feedback and Integration to Improve a Digital Product (Spring, 2010)
Software Systems for Music and Sound (Spring, 2010)
Mathematical Logic (Fall, 2010)
Behind Facebook (Fall, 2010)
Teaching Data Structures & Algorithms to a Fellow Student (Fall, 2010)
Programming Chess (two students; January Term 2011)
The Semantic Web (Spring, 2011)
Programming Visuals for Musical Performance (Spring, 2011)
Microcomputers and Assembly Language (Spring, 2011)
Programming with Data Structures (Spring, 2011)
Audio-Reactive Computer Graphics (Spring, 2011)
Low-Tech Computing: The History, Theory, and Philosophy of Computer Science (four students; Spring, 2011)
Research in Genetic Programming (Spring, 2012)
Introduction Genetic Programming: Evolving Computer Programs with PushGP (two students; Spring, 2012)
Research in Computational Intelligence (Fall, 2012)
Human-Computer Interaction (Fall, 2012)
Game Theory (Fall, 2012)
Rebuilding ICU Hampy (two students; January Term, 2013)
Web Development and Entrepreneurship (January Term, 2013)
Visualizing Genetic Programming (January Term, 2013)
Advising Student Game Development Group (Spring, 2013)

Worldbuilding and Game Design (Spring, 2013)
Decision Theory & Automated Interactions (Spring, 2013)
Entrepreneurship and the Technology Market (Spring, 2013)
Creating randomly generated art (Spring, 2013)
Data Structures and Algorithms (Spring, 2013)
Discrete Math and Core Issues of Theoretical Computer Science (Spring, 2013)
Data Structures and Algorithms (two students; Fall, 2013)
Writing Chaos Theory (Fall, 2013)
Computational Intelligence Laboratory Research Group (two students; Fall, 2013)
Freelance Hardware Hacking (Fall, 2013)
Computational Intelligence Laboratory Research Group (two students; Spring, 2014)
Evolving Image Compression Degradation Judging Algorithm (Spring, 2014)
Programming in C# (Spring, 2014)
Natural Language Processing (Spring, 2014)
Computational Intelligence Laboratory Research Group (four students; Fall, 2014)
Evolution of Strategy: Settlers of Catan (Fall, 2014)
Functional Programming: Haskell & Clojure (Fall, 2014)
Yiddish in Games and Education (Fall, 2014)
Computational Intelligence Laboratory Research Group (three students; Spring, 2015)
Algorithms and Data Structures (Spring, 2015)
Real World App Creation Project (Fall, 2015) Computational Intelligence Laboratory (Spring, 2016)
Arduino-Based Machines to Assist Glassblowing (Spring, 2016)
Introduction to Algorithmic Composition in Clojure (Spring, 2016)
Introduction to Computer Science (Spring, 2016)
Data Science and Computer Science (Fall, 2017)
Python Programming for Psychology (Fall, 2017)
Mobile Application Development (two students; Spring, 2018)
Quantum Computation (Spring, 2018)
TUSH: Genetic Programming for Tensor-Based Machine-Learning Systems (Spring, 2018)
Introduction to Programming in Processing (Spring, 2018)
Computational Intelligence Laboratory (Fall, 2018)
The Unknowable Study (Fall, 2018)
Computational Intelligence Laboratory (four students; Spring, 2019)
Creating a Crowd Simulation Platform (Spring, 2019)
Assembly Language and Microprocessors (Spring, 2019)
Computational Intelligence Laboratory (Fall, 2019)
Data Structures and Algorithms (Fall, 2019)
Computational Intelligence Laboratory Research (Spring, 2020)
Machine Learning (Spring, 2020)
Metaprogramming (Spring, 2020)
Programming Game Theory (two students; Fall, 2020)
Evolutionary Algorithms: Language Processing (Spring, 2021)
Machine Learning in Markets (Fall, 2021)
Artificial Humanity (Spring, 2022)
Accessible Mapping (Fall, 2022)
Lexicase Selection (recorded as "Individualized Study," UMass Amherst, Spring, 2023)

Software Development Projects

LGP, HiGP, MidGP, PushGP, Pushpop, Clojust, Propel, Propeller and other tools for genetic programming research and applications. 1995–present.
See http://hampshire.edu/lspector/code.html and https://github.com/lspector.

Rock Paper Stuff, a game designed for artificial intelligence experiments and education. 2017.
See https://github.com/lspector/rock-paper-stuff.

Pucks, An environment for experiments and education in artificial intelligence and artificial life. 2014–2016.
See https://github.com/lspector/pucks.

QGAME (Quantum Gate and Measurement Emulator), a system for simulating quantum computer algorithms on ordinary (classical) computer hardware, based on the quantum gate array model of quantum computation. 1999–2005.
See http://hampshire.edu/lspector/qgame.html.

SwarmEvolve, a framework for experiments on the emergence of collective behavior in populations of flying agents. 2002-2005. See
http://hampshire.edu/lspector/gecco2003-collective.html.

PLANET H, a framework for experiments on the cognitive psychology of human planning. With Jordan Grafman at the National Institutes of Health, NINDS. 1996–1998.

What about AIDS?, WWW and CD ROM versions of the New York Hall of Science exhibit on AIDS. With Christopher Chase, Richard Muller, and Rebecca S. Neimark. 1994–1998.

CHORES, a framework for experiments on the cognitive psychology of human planning. With Jordan Grafman at the National Institutes of Health, NINDS. 1992–1996.

ErunticLab, an artificial life environment with genetic genetic programming components. 1995. See http://hampshire.edu/lspector/code.html.

Semantic network-based "Stream of Consciousness" interface concept for James Joyce *Ulysses* CD ROM. With StonySoft. 1994.

Arts and Media Projects

Simulation-based animations demonstrating gene flow for the *RACE: Are We So Different?* museum exhibit. With Alan Goodman and Robert Garfinkle. 2010.

First Week, audio composition derived from a Division Blocks simulation. Submitted to the Fundación Telefónica VIDA 10.0 International Competition.
http://hampshire.edu/lspector/firstweek/firstweek.html.

Selection Songs, music produced by evolving agents in a 3D virtual world. *YLEM Journal*, Vol. 25, No. 6 & 8, pp. 24–26, and accompanying CD. With Jon Klein and Kyle Harrington. 2005.

Albers Automaton, 13x13, a digital projection piece based on the self-organization of colored fields. Gallery Tk (Northampton, Massachusetts); November 18 – December 5, 2004.

CA3D, projection artworks based on 3D cellular automata. Venues include Show Gallery's October, 2002 MASQ fundraiser (Northampton, Massachusetts); Pablo (Bongohead) Yglesias's 2002 Bar 19 show (Northampton, Massachusetts); Open Square Arts Party, April, 2004 (Holyoke, Massachusetts).

SwarmEvolveMusic, projection artworks (with audio) based on simulations of evolving, goal-directed swarms. Venues include Show Gallery's October, 2002 MASQ fundraiser (Northampton, Massachusetts) and Bar 19 (Northampton, Massachusetts). 2002.

Autonomous Color Studies, flat panel/projection artworks based on 2D cellular automata. 1999.

Adapta, musical piece for singing audience and evolutionary computation. Invited concert presentation. New Music Mini-Festival, Center for the Arts, Wesleyan University. 1996.

Twitchy, interactive sculpture with video sensing and sound and servo motor motion output. Lemelson-funded E-Team project. Hampshire College. With James Carlson and Garth Zenie. 1995.

Speech activated interactive component of *King Anthracite* installation. With Stashu Kybartas. 1993.

Life & Death, interactive sound installation. 18th Annual Electronic Music Plus Festival. With Benjy Bernhardt and Rebecca S. Neimark. 1991.

MEDIA

Quotes and Mentions

The Amherst STEM Network "When AI Meets the Liberal Arts: How a Campus Initiative is Sparking Critical Interdisciplinary Conversations about AI," by Brooke Ingemi. November 1, 2025. https://www.amherststemnetwork.com/2025/11/01/when-ai-meets-the-liberal-arts/

The Oberlin Alumni Magazine, "The Spector Sound," Fall, 2018. https://www2.oberlin.edu/alummag/fall2018/issue/html5forpc.html?page=20

Quanta Magazine, "Mathematical Simplicity May Drive Evolution's Speed," by Jordana Cepelewicz. November 29, 2018. https://www.quantamagazine.org/computer-science-and-biology-explore-algorithmic-evolution-20181129/

Sentient interview for "Experts weigh in on the future of AI and evolutionary algorithms." July, 2018. https://www.sentient.ai/labs/experts/ or https://www.youtube.com/watch?v=UWoWBiMowLI

The Boston Globe, "Possible cheating uncovered in popular Harvard computer class," by Travis Andersen and Brian MacQuarrie. May 5, 2017. https://www.bostonglobe.com/metro/2017/05/04/possible-cheating-uncovered-popular-harvard-computer-class/4Wu2EfzWMEwXveBuuo9qFJ/story.html

Harvard Business Review, "There Will Always Be Limits to How Creative a Computer Can Be," by Tony McCaffrey. April 24, 2017. https://hbr.org/2017/04/there-will-always-be-limits-to-how-creative-a-computer-can-be

WFCR, National Public Radio, "Rethinking Computer Intelligence," by Karen Brown, radio story. June 17, 2014. http://nepr.net/news/2014/06/17/rethinking-computer-intelligence/

Ars Technica website, "Scientific computings future: Can any coding language top a 1950s behemoth?," by Lee Phillips. May 7, 2014. http://arstechnica.com/science/2014/05/scientific-computings-future-can-any-coding-language-top-a-1950s-behemoth/

New Scientist magazine, "Wolf packs don't need to cooperate to make a kill," by Michael Marshall. Co-authored paper cited; co-author quoted. October 26, 2011.

WFCR, National Public Radio, "Hampshire Prof. Wins Grant to Create Computer Software That Can Evolve On Its Own," by Fred Bever, radio story. September 6, 2010.

The Daily Hampshire Gazette, "Eureka: Evolution as world's greatest calculator," by Kristin Palpini. Column on the receipt of the gold medal in the "Human-Competitive Results" competition at the 2008 Genetic and Evolutionary Computation Conference. August 15, 2008.

The Daily Hampshire Gazette, news item on a grant from the NSF CreativeIT program. October 19, 2007.

The Poughkeepsie Journal, announcing "Evolutionary Computation for Science, Engineering and Art," a presentation at SUNY New Paltz. April 26, 2007.

The Daily Hampshire Gazette, news item on the receipt of the gold medal in the "Human-Competitive Results" competition at the 2004 Genetic and Evolutionary Computation Conference, by Cheryl B. Wilson. August 23, 2004.

The Chronicle of Higher Education, on receiving the NSF Director's Award for Distinguished Teaching Scholars. "National Science Foundation Honors Teaching Scholars." On-line version: May 9, 2003, http://chronicle.com/prm/daily/2003/05/2003050905n.htm

The Daily Hampshire Gazette, feature story on the NSF Director's Award for Distinguished Teaching Scholars. "Hampshire prof wins national teaching award," by Cheryl B. Wilson. May 12, 2003.

The Daily Hampshire Gazette, on the awarding of an NSF/MRI grant. May 13, 2002.

The Daily Hampshire Gazette, on the politics of software choices. "Hampshire takes lead on software," by Stacey Butterfield. November 24, 2001.

Technology Research News, on the use of digital organisms in the study of evolutionary dynamics. "Virtual beings boost evolutionary theory," by Ted Smalley Bowen. October 10, 2001.

The Chronicle of Higher Education, on open-source software. "Hampshire College Favors Noncommercial Web Software Open to All." Print version: October 26, 2001, page A35.

New Scientist, on the use of genetic programming for applications in quantum computing. January 20, 2001.

The Orlando Sentinel, on robotic pets. "They Bark, They Byte. Robotic Rovers Are The Rage — Woof It Up With Our Computerized-Pets Guide." Friday, December 8, 2000.

Details magazine, on the possibility of computers having senses of humor. "Take My Hard Drive... Please; A computer may have beaten chess champion Garry Kasparov, but will one ever be able to tell a joke?" March, 2000.

The Daily Hampshire Gazette, on the importance of computers in the 20th century. "It was a century for invention." January 1/2, 2000.

Salon.com on-line magazine, on genetic programming applications to quantum computing and jazz composition. "Software that Writes Software." August 10, 1999.
http://www.salon.com/tech/feature/1999/08/10/genetic_programming/index.html

Scientific American, on the use of "cultures" in genetic programming and on ontogenetic programming. "Programming With Primordial Ooze." October, 1996.

Memberships

Institute of Electrical and Electronics Engineers (IEEE), Senior Member
Association for Computing Machinery (ACM)
ACM SIGEVO
International Society for Artificial Life