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EDUCATION

A.B. in Philosophy, The University of Chicago (1981) *Thesis: The Life and Teachings of Herakleitos*

M.S. in Computer Science, Illinois Institute of Technology (1986) *Thesis: A Survey of Non-Standard Logics*

Ph.D. in Computer Science, Illinois Institute of Technology (1990) *Thesis: Forcing and Genericity on the Polynomial Hierarchy*

Sabbatical year in Experimental Evolution, University of Idaho, Wichman Lab (2001) *Topic: Experimental evolution of PhiX174*

Sabbatical in Microbial Ecology, Marine Biology Lab, Woods Hole, MA (2007) *Microbial Diversity Course*

PROFESSIONAL EXPERIENCE

ACADEMIC EXPERIENCE

POSITIONS AND EMPLOYMENT

University Distinguished Professor, University of Idaho (2016 to now)

Adjunct Professor, University of Idaho (1998 to now) Philosophy

Adjunct Professor, University of Idaho (2006 to now) Computer Science

Professor, University of Idaho (2003 to now) Bioinformatics and Computational Biology

Professor, University of Idaho (2006 to 2016) Biological Sciences

Professor, University of Idaho (2000 to 2006) Computer Science

Associate Professor, University of Idaho (1996 to 2000) Computer Science

Assistant Professor, University of Idaho (1990 to 1996) Computer Science

UNIVERSITY OF IDAHO, ADMINISTRATIVE EXPERIENCE

Director, BEACON NSF Science and Technology Center (2010 to now) UI Site Lead

Strategic planning committee, University of Idaho, Institute for Bioinformatics and Evolutionary Studies (2014 to now)

Director, Idaho INBRE Bioinformatics Core (2000 to 2017)

Research Oversight Team, University of Idaho, Institute for Bioinformatics and Evolutionary Studies (1998 to 2014)

Director, University of Idaho, Institute for Bioinformatics and Evolutionary Studies (1999 to 2011) Computational Resources Core

Board, University of Idaho, Graduate program in Bioinformatics and Computational Biology (BCB) (2006 to 2009)

Director, University of Idaho, Graduate program in Bioinformatics and Computational Biology (BCB) (2003 to 2006)

UNIVERSITY OF WASHINGTON MEDICAL SCHOOL

Adjunct Professor, University of Washington (2003 to now) Biomedical Informatics

IDAHO STATE UNIVERSITY

Adjunct Professor, Idaho State University (2003 to 2010) Biological Sciences

NORTHEASTERN ILLINOIS UNIVERSITY

Lecturer, Northeastern Illinois University (1987 to 1988) Computer Science

Assistant Professor, Northeastern Illinois University (1988 to 1990) Computer Science

INDUSTRIAL EXPERIENCE

Senior Scientist and President, Digital Genetics LLC, Consulting business (1998 to now)

Consultant, Science Research Associates, Commonwealth Edison, Springer Verlag, Prentice Hall, McGraw-Hill, Oxford Press, National Technical University, New Light Industries (1982 to 2008)

Systems Analyst, Science Research Associates (1985 to 1998) Chicago, IL

Systems Programmer, Continental Illinois National Bank (1981 to 1985) Chicago, IL

PROFESSIONAL AFFILIATIONS

Institute for Bioinformatics and Evolutionary Studies (IBEST), University of Idaho (2012 to now)

International Society for Computational Biology (ISCB), (2000 to now) Member

Eta Sigma Phi, National Honorary Classical Fraternity (1992 to now)

Senior Member ISCB, International International Society for Computational Biology (ISCB) (2015 to now) Senior Member

American Association for the Advancement of Science (AAAS), (2006 to now) Member

International Society for Microbial Ecology (ISME), (2006 to now) Member

International International Society for Computational Biology (ISCB), (2006 to 2015) Member

Initiative for Bioinformatics and Evolutionary Studies (IBEST), University of Idaho (1993 to 2012) Member, co-Founder

International Society for Genetic and Evolutionary Computation (ISGEC), (1994 to 2010) Member

Center for Secure and Dependable Software, University of Idaho (1996 to 2006)

Institute for Electrical and Electronics Engineers (IEEE), (1996 to 2006) Senior Member

Association Association for Computing Machinery (ACM), (1985 to 1999) Member

IAS Member, Idaho Academy of Science (1996 to 1999) Member

IEEE Computer Society, (1990 to 1996) Member

RESEARCH

PUBLICATIONS

REFEREED

1. MK McGuire, CL Meehan, MA McGuire, JE Williams, JA Foster, DW Sellen, EW Kamau-Mbuthia, EW Kamundia, SE Moore, LJ Kvist, GE Otoo, SL Brooker, WJ Price, B Shafii, C Placek, KA Lackey, B Robertson, S Manzano, L Ruiz, JM Rodriguez, R Pareja, L Bode (Pending or In Press) What's normal? Oligosaccharide concentrations and profiles in milk produced by healthy women vary

- geographically. *American Journal of Clinical Nutrition*, In Press
2. IY Zhbannikov, SS Hunter, JA Foster, M Settles (Pending or In Press) SeqyClean: a pipeline for high-throughput sequence data preprocessing. *ACM Conference on Bioinformatics and Computational Biology*
 3. JA Foster (Pending or In Press) Taking “biology” just seriously enough. *Genetic Programming and Evolvable Machines*, In Press
 4. M MK McGuire, CL Meehan, S Brooker, JE Williams, JA Foster, MA McGuire (2016) An Evolutionary, Biosocial Perspective on Variation in Human Milk Microbes and Oligosaccharides: An Example of Eco-Homeorhesis?. *Prebiotics and Probiotics in Human Milk: Origins and Functions of Milk-Borne Oligosaccharides and Bacteria*, McGuire, McGuire, and Bode eds
 5. IY Zhbannikov, SS Hunter, JA Foster, M Settles (2016) SeqyClean: a pipeline for high-throughput sequence data preprocessing. *ACM conference on Bioinformatics and Computational Biology*
 6. W Banzhaf, B Baumgaertner, G Beslon, R Doursat, JA Foster, B McMullin, VV de Melo, T Miconi, L Spector, S Stepney, R White (2016) Defining and Simulating Open-Ended Novelty: Requirements, Guidelines, and Challenges. *Theory in Biosciences*, 135:131-161
 7. CS Greene, JA Foster, BA Stanton, DA Hogan, Y Bromberg (2016) Computational approaches to study microbes and microbiomes. *Pacific Pacific Symposium on Biocomputing*, 21:557-567
 8. DL Beck, JA Foster (2015) Machine learning classifiers provide insight into the relationship between microbial communities and bacterial vaginosis. *Biomedical Data Mining and Analysis*, 8:23, DOI 10.1186/s13040-015-0055-3
 9. S Ma, JA Foster, LJ Forney (2015) Network analysis reveals a potentially "evil" alliance of opportunistic pathogens inhibited by a cooperative network. *Nature Scientific Reports*, 5, 8275–6
 10. IY Zhbannikov, JA Foster (2015) MetaAmp: Analysis high-throughput microbial amplicon sequence data with multiple markers. *Bioinformatics*, 31(11), 1830–1832. <http://doi.org/10.1093/bioinformatics/btv049>
 11. DL Beck, C Daniels, JA Foster (2014) Seed: A microbial community visualization tool. *Bioinformatics*, pii: btu693
 12. J Carter, DL Beck, H Williams, G Dozier, JA Foster (2014) GA-Based Selection of Vaginal Microbiome Features Associated with Bacterial Vaginosis. *Genetic and Evolutionary Computation Conference (GECCO)*, 2014, Vancouver, BC Canada
 13. YS Baker, R Agrawal, JA Foster, DL Beck, G Dozier (2014) Detecting Bacterial Vaginosis Using Machine Learning. *ACM Southeast Conference*, Springer
 14. JA Foster (2014) Microbial diversity, bar-coding approaches. *Encyclopedia of Metagenomics*, Springer
 15. YS Baker, R Agrawal, JA Foster, DL Beck, G Dozier (2014) Applying Machine Learning Techniques in Detecting Bacterial Vaginosis. *International Conference on Machine Learning and Cybernetics (ICMLC)*, Lanzhou, China
 16. DL Beck, JA Foster (2014) Machine learning techniques accurately classify microbial communities by bacterial vaginosis characteristics. *PLOS One*, 9(2):e87830
 17. KA Pattin, AC Greene, RB Altman, LE Hunter, DA Ross, JA Foster, JH Moore (2014) Building the next generation of quantitative biologists. *Pacific Symposium in Biocomputing*, 2014
 18. JA Foster (2013) Introduction to special section: Best of EuroGP/EvoBIO. *Genetic Programming and Evolvable Machines*, 14:429-430, DOI 10.1007/s10710-013-9194-9
 19. HK Allen, J Bunge, JA Foster, DO Bayles, BA Stanton (2013) Estimation of viral species richness from shotgun metagenomes using a frequency count approach. *Microbiome*, 1(5), DOI: 10.1186/2049-2618-1-5
 20. IY Zhbannikov, M Settles, SS Hunter, JA Foster (2013) SlopMap: a software application tool for quick and flexible identification of similar sequences using exact k-mer matching. *Journal of Data Mining in Genomics and Proteomics*, 4(3):1-6. doi: 10.4172/2153-0602.1000133
 21. JC Madan, D Koestler, BA Stanton, L Davidson, JH Moore, M Sogin, MR Karagas, H Morrison, T Hampton, PE Palumbo, M Guill, JA Foster, PL Hibberd (2012) Serial analysis of the gut and

- respiratory microbiome in CF in infancy: the interaction between intestinal and respiratory tracts and the impact of nutritional exposures. *eBio*, 3(4):e00251-12, 10.1128/mBio.00251-12
22. WK Copeland, V Krishnan, DL Beck, M Settles, JA Foster, K-C Cho, MD Day, R Hickey, UME Schütte, X Zhou, CJ Williams, LJ Forney, Z Abdo (2012) mcaGUI: Microbial community analysis R-GUI. *Bioinformatics*, 28(16):21989. doi: 10.1093/bioinformatics/bts338
 23. JA Foster, J Bunge, J Gilbert, JH Moore (2012) Measuring the microbiome: Perspectives on advances in DNA-based techniques for exploring microbial life. *Briefings in Bioinformatics*, 4(13):420-9, 10.1093/bib/bbr080
 24. S Silva, JA Foster (2012) Guest editorial: special issue on selected papers from the European conference on genetic programming. *Genetic Programming and Evolvable Machines*, 13:271-273
 25. J Bunge, L Woodard, D Bohning, HK Allen, JA Foster, S Conolly (2012) Estimating population diversity with CatchAll. *Bioinformatics*, 28(7):1045-47, DOI: 10.1093/bioinformatics/bts075
 26. JC Madan, R Cowper-Sallari, D Saxena, L Davidson, GA O'Toole Jr, JH Moore, M Sogin, JA Foster, PE Palumbo, PL Hibberd (2012) Gut microbial colonization in premature neonates predicts neonatal sepsis. *Archives of Disease in Childhood*, 10.1136/fetalneonatal-2011-301373, PMID: 22562869, PMCID: PMC3724360
 27. J Bunge, D Bohning, HK Allen, JA Foster (2012) Estimating population diversity with unreliable low frequency counts. *Pacific Symposium on Biocomputing*, 203-212
 28. JA Foster, JH Moore, J Gilbert, J Bunge (2011) Microbiome studies: analytical tools and techniques. *Pacific Symposium in Biocomputing.*, RB Altman, AK Dunke, L Hunter, TA Murray (eds)
 29. KM Hunt, JA Foster, LJ Forney, UME Schütte, DL Beck, Z Abdo, LK Fox, JE Williams, MK McGuire, MA McGuire (2011) Characterization of the diversity and temporal stability of bacterial communities in human milk. *PLOS One*. 6(6) e21313, doi:10.1371/journal.pone
 30. V Norris, A Zemirline, P Amar, JN Audinot, P Ballet, B-E Jacob, G Bernot, G Beslon, A Cabin, E Fanshon, JL Giavitto, N Glade, P Greussay, Y Grondin, JA Foster, G Hutzler, J Jost, F Képès, O Michel, F Molina, J Signorini, P Stano, AR Thierry (2011) Computing with bacterial constituents, cells and populations: from bioputing to bactoputing. *Theory Biosci*, 130(3):211-228
 31. MD Day, DL Beck, JA Foster (2011) Microbial communities as experimental units. *Bioscience*, 61(5):398-406
 32. JA Foster, JH Moore (2011) Microbiome Studies: PSB 2011 special session introduction. *Proc, Pacific Symposium in Biocomputing*
 33. DL Beck, M Settles, JA Foster (2011) OTUbase: an R infrastructure package for operational taxonomic unit data. *Bioinformatics*, 27(12):1700-1701, doi: 10.1093/bioinformatics/btr196
 34. S Silva, JA Foster (2010) Introduction to the GPEM special issue on the best of EuroGP 2010. *Genetic Programming and Evolvable Machines*
 35. UME Schütte, Z Abdo, JA Foster, J Ravel, J Bunge, B Solheim, LJ Forney (2010) Bacterial diversity in a glacier foreland of the high arctic. *Molecular Ecology*, 19(1):41-53. DOI 10.1111j
 36. JA Foster, SM Krone, LJ Forney (2009) Application of Ecological Network Theory to the Human Microbiome. *Interdisciplinary Perspectives on Infection Diseases*. 2009:6pp, doi:10.1155/2009/839501
 37. M Keitzer, JA Foster (2007) Crossover Bias in Genetic Programming. *Proceedings of the 10th European Conference on Genetic Programming*, LNCS 4445:33-44
 38. X Zhou, CJ Brown, Z Abdo, CC Davis, MA Hansmann, P Joyce, JA Foster, LJ Forney (2007) Differences in the composition of vaginal microbial communities found in healthy Caucasian and black women. *ISME Journal*, 1(2):121-33. Epub 2007 May 10. PMID: 18043622
 39. LJ Sheneman, J Evans, JA Foster (2006) Clearcut: the reference implementation for the relaxed neighbor joining phylogenetic tree construction method. *Bioinformatics*. 15(22):2823-4, PMID: 16982706
 40. W Banzhaf, G Beslon, S Christensen, JA Foster, F Képès, V Lefort, JF Miller, M Radman, JJ Ramsden (2006) From artificial evolution to computational evolution: a research agenda. *Nature Reviews Genetics*, 7(9):729-735

41. C Shyu, T Soule, SJ Bent, JA Foster, LJ Forney (2006) MiCA: A Web-Based Tool for the Analysis of Microbial Communities Based on Terminal-Restriction Fragment Length Polymorphisms (T-RFLP). *Journal of Microbial Ecology*. 53(4):562-570, PMID 17406775
42. J Evans, LJ Sheneman, JA Foster (2006) Relaxed neighbor joining: a fast distance-based phylogenetic tree construction method. *Journal of Molecular Evolution*. 62(6):785-92, PMID: 16752216
43. LJ Forney, JA Foster, W Ledger (2006) The vaginal flora of healthy women is not always dominated by *Lactobacillus* sp *Journal of Infectious Disease*. *Journal of Infectious Disease*, 195:1468-1469
44. M Harrison, JA Foster (2004) Co-evolving faults to improve the fault tolerance of sorting networks. Proc. European conference on genetic programming, Springer Verlag, Lecture Notes in Computer Science, M Keijzer, UM. O'Reilly, SM. Lucas, E Costa and T Soule, Eds, Volume 3003, pp 57-66
45. C Shyu, LJ Sheneman, JA Foster (2004) Evolutionary computation for multiple sequence alignment. *Genetic Programming and Evolvable Machines*. Kluwer, 5(2) pp 121-144
46. LJ Sheneman, JA Foster (2004) Evolving better multiple sequence alignments. Proc. Genetic and Evolutionary Computing Conference (GECCO), Springer Verlag, K Deb et al., eds, Lecture Notes in Computer Science, Volume 3102, pp, 449-460
47. C Shyu, JA Foster (2004) Evolving consensus sequence for multiple sequence alignment with a genetic algorithm. Proc Genetic and Evolutionary Computing Conference (GECCO)
48. M Harrison, JA Foster (2004) Improving the survivability of a simple evolved circuit through co-evolution. Proc. NASA/DoD Conference on Evolvable Hardware, IEEE Press, R Zebulum, D Gwaltney, G Horbny, D Keymeulen, J Lohn, A Stoica, Eds, pp 123-129
49. W Banzhaf, JA Foster (2004) Introduction to GPEM Special issue on biological applications of genetic and evolutionary computation. Genetic and Evolutionary Computation Conference, 5(2), Guest editor, special issue of biological applications
50. K Imamura, T Soule, RB Heckendorn, JA Foster (2003) Behavioral Diversity and a Probabilistically Optimal GP Ensemble. *Genetic Programming and Evolvable Machines*, Kluwer, 4:235-253
51. R Shepherd, JA Foster (2003) Inherent fault tolerance in evolved sorting networks. Proc. Genetic and Evolutionary Computing Conference (GECCO). Springer-Verlag, p. 461, July
52. E Cantu-Paz, JA Foster (2003) Introduction to Genetic and Evolutionary Computation. Genetic and Evolutionary Computation Conference (GECCO), Introduction, Springer Verlag LNCS 2723 and 2724
53. MM Meysenburg, D Hoelting, D McElvain, JA Foster (2002) A genetic algorithm-specific test of random generator quality. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann, p 691
54. K Imamura, JA Foster (2002) Abstention reduces errors: decision abstaining N-version genetic programming. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, 796-803
55. C Shyu, JA Foster, K Liao, SJ Bent, K Sale, LJ Forney, T Soule (2002) Computational Methods for the Analysis of Microbial Community Structure and Composition. Proc. American Society of Microbiologists (ASM). p, 461
56. C Shyu, JA Foster, LJ Forney (2002) Electronic Polymerase Chain Reaction (EPCR) Search Algorithm. Proc. IEEE 1st Bioinformatics Conference. p, 338
57. MM Meysenburg, D Hoelting, D McElvain, JA Foster (2002) How random generator quality impacts genetic algorithm performance. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, pp, 480-483
58. JA Foster, E Lutton (2002) Introduction to European Conference on Genetic Programming. European Conference on Genetic Programming (EuroGP), Editor, Springer Verlag LNCS 2278, ISBN 3-540-43378-3
59. C Shyu, JA Foster, K Liao, SJ Bent, K Sale, LJ Forney, T Soule (2002) MiCA: Microbial Community Analysis. Proc. IEEE 1st Bioinformatics Conference. p, 341
60. C Shyu, JA Foster, K Liao, SJ Bent, K Sale, LJ Forney, T Soule (2002) Microbial Community Analysis (MiCA): Web-Based Computational Tools for the Analysis of Microbial Community Structure and Composition Based on Terminal Restriction Fragment Length Polymorphism (T-RFLP) of 16S rDNA genes. Proc. American Society of Microbiologists (ASM), p 462

61. K Imamura, JA Foster (2002) N-version genetic programming via fault masking. Genetic Programming: Proc. 5th European Conference, EuroGP, Lecture Notes in Computer Science 2278. Springer Verlag, 172-181
62. J Determan, JA Foster (2001) A genetic algorithm for expert system rule generation. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, p 757
63. B Rylander, JA Foster (2001) Computational complexity and genetic algorithms. Advances in Fuzzy Systems and Evolutionary Computation. Artificial Intelligence Series, E Nikos Mastorakis, ed., World Scientific and Engineering Society Press, pp, 248-253
64. B Rylander, T Soule, JA Foster (2001) Computational complexity, genetic programming and implications. Genetic Programming: Proc. 4th European Conference, EuroGP 2001, Lecture Notes in Computer Science, 2038, Springer-Verlag, 348-360
65. JA Foster (2001) Discipulus: the first commercial genetic programming system, invited publication in J. Genetic Programming and Evolvable Hardware. 2:2, pp, 201-203
66. JA Foster (2001) Evolutionary computation. Nature Genetics Reviews, 2:428-436
67. K Imamura, JA Foster (2001) Fault-tolerant computing with N-version genetic programming. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann, p 178
68. K Imamura, JA Foster (2001) Fault-tolerant hardware through n-version genetic programming. Proc. 5th World Multiconference on Systemics, Cybernetics and Informatics (SCI 2001)
69. B Rylander, JA Foster (2001) Genetic algorithms and hardness. Advances in Fuzzy Systems and Evolutionary Computation. Artificial Intelligence Series, E Nikos Mastorakis, ed., World Scientific and Engineering Society Press. pp, 323-329
70. B Rylander, T Soule, JA Foster, J Alves-Foss (2001) Quantum evolutionary programming. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann, pp. 1005-1011, Morgan Kaufmann
71. J Dumolin, S McGrew, J Frenzel, JA Foster (2000) Special purpose image convolution with evolvable hardware. Proc. Int. Workshop on Evolvable Image and Digital Processing, Lecture Notes in Computer Science 1803. Springer Verlag, pp. 1-11
72. GKM Goh, JA Foster (2000) Evolving Molecules for Drug Design Using Genetic Algorithms via Molecular Trees. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, pp, 27-33
73. B Rylander, JA Foster (2000) GA hard problems. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann. p, 367
74. B Rylander, T Soule, JA Foster (2000) Quantum evolutionary computation. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann. p, 373
75. J Masner, J Cavalieri, J Frenzel, JA Foster (2000) Size versus robustness in evolved sorting networks: is bigger better? Proc. NASA/DoD Workshop on Evolvable Hardware (EH), IEEE Press, pp, 81-90
76. HS Snevily, JA Foster (2000) The 2-pebbling property and a conjecture of graham's (Pending or In Press) . Graphs and Combinatorics, 16:231-344
77. K Imamura, JA Foster, A Krings (2000) The test vector problem and limitations to evolving digital circuits. Proc. NASA/DoD Workshop on Evolvable Hardware (EH), IEEE Press, pp, 75-80
78. WB Langon, T Soule, R Poli, JA Foster (1999) The evolution of size and shape. Advances in Genetic Programming, L Spector;WB Langdon;U-M O'Reilly;P Angeline (eds), MIT Press, pp 162-191
79. A Morris, JA Foster, FE Petry (1999) Providing support for multiple collection types in a fuzzy object oriented spatial data model. Proc. Int. Conf. North American Fuzzy Inf. Proc. Soc. (AFIPS), IEEE Press
80. MM Meysenburg, JA Foster (1999) Random number generator and GA performance revisited. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, pp, 425-432
81. MM Meysenburg, JA Foster (1999) Random number generator and GP performance. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO), Morgan Kaufmann, pp, 1121-1126
82. J Masner, J Cavalieri, J Frenzel, JA Foster (1999) Representation and robustness for evolved sorting networks. Proc. NASA/DoD Workshop on Evolvable Hardware (EH), IEEE press, pp, 255-261

83. B Harvey, D Frincke, JA Foster (1999) Toward byte code genetic programming. Proc. Int. Congress on Genetic and Evol. Comp. (CEC). p, 1234
84. J Determan, JA Foster (1999) Using chaos in genetic algorithms. Proc. Int. Congress on Proc. Int. Congress on Genetic and Evol. Comp. (CEC), pp. 2094-2101
85. B Harvey, JA Foster, D Frincke (1998) Byte code Genetic Programming. Late Breaking Papers at GP98, J. Koza, ed., pp 59-63
86. JA Foster (1998) Evolutionary Computing. Encyclopedia of Distributed Computing
87. J Marconi, JA Foster (1998) Finding cliques in Keller graphs with genetic algorithms. Proc. Int. Conf. On Evolutionary Computing (ICEC), DB. Fogel and PJ. Angeline, eds., IEEE Press, pp, 650-655
88. WF Danielson III, JA Foster, D Frincke (1998) GABSyS: Using genetic algorithms to breed a combustion engine. Proc. Int. Conf. On Evolutionary Computing (ICEC), DB. Fogel and PJ. Angeline, eds., IEEE Press, pp, 259-264
89. T Soule, JA Foster (1998) Limiting code growth in genetic programming. J Evolutionary Computation, 6:4, 293-310
90. T Soule, JA Foster (1998) Removal bias: a new cause of code growth in tree based evolutionary programming. Proc. Int. Conf. On Evolutionary Computing (ICEC), DB. Fogel and PJ. Angeline, eds., IEEE Press, pp, 781-786
91. JS Shoaf, JA Foster (1998) The efficient set GA for stock portfolios. Proc. Int. Conf. On Evolutionary Computing (ICEC), DB. Fogel and PJ. Angeline, eds., IEEE Press, pp, 354-359
92. T Soule, JA Foster (1997) Code size and depth flows in genetic programming. Proc. Int. Conf. On Genetic Programming (GP), Koza, Goldberg, Fogel and Riolo (eds), Morgan Kaufmann, pp, 313-320
93. T Soule, JA Foster (1997) Genetic algorithm hardness measures applied to the maximum clique problem. Proc. Int. Conf. On Genetic Algorithms (ICGA), ed. Bäck, Morgan Kaufmann, pp, 81-88
94. MM Meysenburg, JA Foster (1997) The effect of the quality of pseudo-random number generators on the performance of a simple genetic algorithm. Proc. Int. Conf. On Genetic Algorithms (ICGA), ed. Bäck, Morgan Kaufmann, pp, 276-282
95. JS Shoaf, JA Foster (1996) A Genetic algorithm solution to the efficient set problem: a technique for portfolio selection based on the Markowitz model. Proc. of the 1996 Annual Meeting, Decision Sciences Institute. Vol. II, pages 571-573
96. T Soule, JA Foster, J Dickinson (1996) Code growth in genetic programming. Proc. Genetic Programming (GP), Koza, Goldberg, Fogel and Riolo ed.s, Morgan Kaufmann, pp, 215-223
97. J Clough, JA Foster, M Barnett, HA Wichman (1996) Computer simulation of transposable element evolution: Random template and strict master models. J Mol. Evol., 42:52-58
98. JA Foster, M Barnett (1996) Moore formal methods in the classroom: A how-to manual. In M Hinchey and N Dean, editors, Teaching and Learning Formal Methods. Academic Press. pp, 79-98
99. T Soule, JA Foster, J Dickinson (1996) Using genetic programming to approximate maximum cliques. Proc. Genetic Programming (GP), Koza, Goldberg, Fogel and Riolo ed.s, Morgan Kaufmann, pp, 400-405
100. JA Foster, M Barnett, K Van Houten, LJ Sheneman (1995) (In-)Formal methods: Teaching program derivation via the Moore method. Computer Science Education, 6(1), pp. 67-91, July
101. JA Foster (1995) Exploring the polynomial hierarchy with generic sets. J Computing and Info., pages 166-183, July
102. JA Foster, PW Oman, K Van Houten, W Zhu (1995) Using self-delimiting strings to represent trees. Congressus Numerantium, 107:5-22, July
103. JA Foster, PW Oman, K Van Houten (1993) A highly compact representation of tree structures (abstract). Proceedings of the Data Compression Conference. p 453, March
104. PW Oman, K Van Houten, JA Foster (1993) Representing arbitrary trees as self-delimiting binary strings. Congressus Numerantium, 96:47-56, December
105. JA Foster (1993) The generic oracle hypothesis is false. Info. Proc. Letters, 45:59-62, 26 February

106. JA Foster (1992) The generic oracle hypothesis fails. In WW Koczkodaj, PE Lauer, and AA Toptsis, editors, International Conference on Computing and Information. pages 75-78. IEEE, May
107. JA Foster (1979) The greatness which was Greece. *Inquiry*, 1(1)

PEER REVIEWED

1. N Sugawara-Beda, JA Foster (2017) Visualizing Science. Pritchard Gallery, Art exhibit
2. C Shyu, JA Foster (2004) Characterization of Microbial Diversity Based on T-RFLP Data with Nonparametric Statistics. American Society of Microbiologists (ASM)
3. LJ Sheneman, JA Foster (2004) Evolving Better Alignments. Pacific Symposium on Biocomputing, One page poster abstract
4. C Shyu, JA Foster (2004) Nonparametric Statistical Approaches for Inferring Microbial Community Structures Based on Terminal Restriction Fragment Length Polymorphisms (T-RFLP). Pacific Symposium on Biocomputing, One page poster abstract
5. C Shyu, JA Foster (2004) Performance Comparison of Multiple Sequence Alignment Programs Using Nonparametric Statistics. Research in Computational Biology (RECOMB)
6. C Shyu, JA Foster (2003) Inferring Microbial Community Structures with Dynamic Programming and Bayesian Statistics. American Society of Microbiologists (ASM), May 18-22
7. LW Lass, DC Thill, B Shafii, W Price, JA Foster (1998) Protected spatial data exchange from multiple data sources using the World Wide Web. Proceedings of the Weed Sciences Society of America
8. JA Foster (1992) Structure in complexity theory. *Bulletin of the European Association for Theoretical Computer Science*. 46:239-47, February
9. JA Foster (1987) Differential geometry on fractal manifolds. *The Journal of Chaos and Graphics*, 2(30), August
10. JA Foster (1979) Real security. *Critical Inquiry*, 1(1)
11. JA Foster (1978) The formal incomprehensibility of the creation stories in genesis. *Illinois Libertarian*

BOOK OR BOOK CHAPTER

1. S Silva, JA Foster, M Nicolau, P Machado, M Giacobini (2011) European Conference on Genetic Programming. European Conference on Genetic Programming (EuroGP), Editor, Springer Verlag LNCS 6621, ISBN 978-3-642-20406-7
2. E Cantu-Paz, JA Foster (2003) Genetic and Evolutionary Computation. Genetic and Evolutionary Computation Conference (GECCO), proceedings, Springer Verlag LNCS 2723 and 2724
3. JA Foster, E Lutton, JF Miller, C Ryan, AGB Tettamanzi (2002) European Conference on Genetic Programming. European Conference on Genetic Programming (EuroGP), Editor, Springer Verlag LNCS 2278, ISBN 3-540-43378-3

TECHNICAL REPORTS

1. T Soule, JA Foster, J Dickinson (1996) Limiting program size in genetic programming. Technical Report LAL 96-2, University of Idaho, Moscow, ID 83844-1010, January
2. T Soule, JA Foster, J Dickinson (1996) Using genetic programming to find maximum cliques. Technical Report LAL 96-3, University of Idaho, Moscow, ID 83844-1010, January
3. JA Foster, M Barnett, K Van Houten, LJ Sheneman (1995) (In-)Formal methods: Teaching program derivation via the Moore method. Technical Report LAL 94-01, University of Idaho, Moscow, ID 83844-1010, September
4. JA Foster (1995) Genetic algorithm hardness and approximation complexity: A research agenda. Technical Report TR-LAL-95-04, University of Idaho, Department of Computer Science, Moscow, ID 83844-1010, May
5. JA Foster, S Fenner (1995) NPCVt c NPSVt\$ if disjoint pairs of Co-NP sets are P-separable. Technical Report LAL 95-01, University of Idaho, Moscow, ID 83844-1010, January
6. HS Snevily, JA Foster (1995) The 2-pebbling property and a conjecture of graham's. Technical Report

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 12. JA Foster (1991) Dense properties and generic witnesses for PH. Technical Report TR 91-09, University of Idaho, Department of Computer Science; Moscow, Id 83855, January
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 14. JA Foster (1989) Models of space-bounded relativization. Technical Report CS-JAF-89-2, Illinois Institute of Technology
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 17. JA Foster (1988) Context sensitive grammars are closed under complementation. Technical Report TR92-0014, International Business Machines
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1. LJ Forney, JA Foster, C Brown, P Joyce, Z Abdo, A Johnson, X Zhou (2009) Categorization of Microbial Communities. patent number US 7,627,437 B2

DATA AND SOFTWARE

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2. (Pending or In Press) 16S amplicons of glacial forefield transects. Sequence Read Archive, NIH NCBI
3. (Pending or In Press) 16S amplicons of human vagina. Sequence Read Archive, NIH NCBI
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7. DL Beck, C Daniels, JA Foster (2014) Seed: A microbial community visualization tool. <https://github.com/danlbek/Seed>
8. IY Zhbannikov, M Settles, SS Hunter, JA Foster (2013) SlopMap: a software application tool for quick and flexible identification of similar sequences using exact k-mer matching. <https://github.com/ibest/slopmap>
9. DL Beck, JA Foster (2011) OTUbase: an R infrastructure package for operational taxonomic unit data. <https://www.bioconductor.org/packages/release/bioc/html/OTUbase.html>
10. LJ Sheneman, J Evans, JA Foster (2006) Clearcut: the reference implementation for the relaxed neighbor joining phylogenetic tree construction method. <https://github.com/ibest/clearcut>
11. C Shyu, JA Foster (2006) MICA: Microbial Community Analysis. <http://mica.ibest.uidaho.edu>

FUNDING

ACTIVE FUNDING AS PI, CO-PI, OR KEY PERSONNEL

JA Foster, Koza donation (2001 to John Koza Donation. \$174,000 total / \$174,000 direct (PI: JA Foster)

E Goodman, K Holekamp, R Lenski, C Ofria, R Pennock, BEACON center for the study of evolution in action (2015 to 2020) NSF STC DBI 0939454. \$22,786,770 total / \$2,500,000 subcontract (PI: E Goodman)

LJ Forney, COBRE: Center for Research on the Processes of Evolution (2012 to 2018) NIH COBRE P30GM103324. \$4,874,014 total (PI: LJ Forney)

MK McGuire, L Bode, JA Foster, C Meehan, S Moore, NSF INSPIRE "What is Normal": Milk, Microbiome, HMO (2013 to 2018) NSF IAA 041485301. \$950,000 total / \$282,442 subcontract (PI: MK McGuire)

ACTIVE FUNDING, OTHER

PAST FUNDING AS PI, CO-PI, OR KEY PERSONNEL

E Goodman, K Holekamp, R Lenski, C Ofria, R Pennock, BEACON center for the study of evolution in action (2010 to 2021) NSF STC DBI 0939454. \$38,035,209 total / \$5,000,000 subcontract (PI: E Goodman)

JA Foster, BEACON: Idaho Administrative budget (2017 to 2018) BEACON Budget Request NSF DBI 0939454. \$84,309 total (PI: JA Foster)

E Mittlestaedt, JA Foster, JL Graves, SH Harrison, J Williams, BEACON: Microbes and Microplastics: Is there evidence for selection in a novel deep ocean niche? (2017 to 2018) BEACON Budget Request NSF DBI 0939454. \$75,047 total (PI: E Mittlestaedt)

C Bohach, Idaho INBRE Bioinformatics Core (2016 to 2017) NIH INBRE P20GM103408-17. \$143,771 total (PI: C Bohach)

JA Foster, BEACON: Idaho Administrative budget (2016 to 2017) BEACON Budget Request NSF DBI 0939454. \$94,439 total (PI: JA Foster)

B Baumgaertner, G Dozier, JA Foster, Simulating signals and security (2015 to 2017) BEACON Budget Request NSF DBI 0939454. \$97,706 total / \$97,706 direct (PI: B Baumgaertner)

B Robison, JA Foster, BEACON: Business for scientists workshop (2016 to 2017) BEACON Budget Request NSF DBI 0939454. \$9,000 total (PI: B Robison)

C Bohach, Idaho INBRE Program (2011 to 2017) NIH INBRE P20GM103408. \$19,560,264 total (PI: C Bohach)

C Bohach, Idaho INBRE Bioinformatics Core (2015 to 2016) NIH INBRE P20GM103408-16. \$143,773 total (PI: C Bohach)

JA Foster, BEACON: Idaho Administrative budget (2015 to 2016) BEACON Budget Request NSF DBI 0939454. \$85,957 total (PI: JA Foster)

B Murdock, JA Foster, MA McGuire, M Settles, BEACON: Has evolution of human milk sugars responded to a biocultural sweet tooth? (2015 to 2016) BEACON Budget Request NSF DBI 0939454. \$110,829 total (PI: B Murdock)

PE Gessler, DR Ewart, JA Foster, LJ Sheneman, CC-NIE Networking Infrastructure: Enhancing Network Capabilities to Foster Big Data Science at the University of Idaho (2013 to 2015) NSF CC-NIE ACI1341040. \$447,969 total / \$447,969 direct (PI: PE Gessler)

C Bohach, Idaho INBRE Bioinformatics Core (2014 to 2015) NIH INBRE P20GM103408-15. \$143,773 total (PI: C Bohach)

JA Foster, BEACON: Idaho Administrative budget (2014 to 2015) BEACON Budget Request NSF DBI 0939454. \$106,222 total (PI: JA Foster)

C Bohach, Idaho INBRE Bioinformatics Core (2013 to 2014) NIH INBRE P20GM103408-14. \$143,773 total (PI: C Bohach)

JA Foster, BEACON: Idaho Administrative budget (2013 to 2014) BEACON Budget Request NSF DBI 0939454. \$99,517 total (PI: JA Foster)

JA Foster, G Dozier, D Beck, BEACON: Genetic algorithms for detecting microbiome and behavioral features associated with bacterial vaginosis (2013 to 2014) BEACON Budget Request NSF DBI 0939454. \$30,275 total (PI: JA Foster)

H Eisthen, PM Vaelli, KR Theis, JA Foster, K Hunt, L Harmon, BEACON: The role of symbiotic bacteria in a predator-prey coevolutionary arms race (2013 to 2014) BEACON Budget Request NSF DBI 0939454. \$114,308 total (PI: H Eisthen)

JA Foster, LJ Forney, Computational support for evolutionary biology (2011 to 2013) JR Murdock Trust . \$335,000 total / \$335,000 direct (PI: JA Foster)

JA Foster, BEACON: Idaho Administrative budget (2012 to 2013) BEACON Budget Request NSF DBI 0939454. \$76,448 total (PI: JA Foster)

R Pennock, JA Foster, JL Graves, R Hayes, B Kerr, LS Mead, JJ Smith, C Wilke, N Serra, A Lark, BEACON: Avida-ED Curriculum Development and Assessment Pilot Study (2012 to 2013) BEACON Budget Request NSF DBI 0939454. \$2,906 total (PI: R Pennock)

J Conner, JA Foster, G Goins, D Tank, I Dworkan, BEACON: The genetic basis of weediness: rapid evolution of flowering time in wild radish (2012 to 2013) BEACON Budget Request NSF DBI 0939454. \$154,875 total (PI: J Conner)

MK McGuire, IOS Preliminary Proposal: Investigating the coevolution of bacterial communities, nutritional components, and immune factors in milk (2013 to 2013) NSF IOS Preproposal 1327223. \$0 total (PI: MK McGuire)

M Dawkins, JA Foster, P Joyce, RB Wells, CJ Williams, Bridge to graduate studies in interdisciplinary sciences (2008 to 2012) NSF DUE 0807030. \$597,331 total (PI: M Dawkins)

JA Foster, BEACON: Idaho Administrative budget (2011 to 2012) BEACON Budget Request NSF DBI 0939454. \$102,300 total (PI: JA Foster)

E Top, The genetic diversity of broad-host-range plasmids in prokaryotes (2010 to 2012) DOE JGI . \$0 total (PI: E Top)

J Sullivan, JA Foster, D Hillis, BEACON: An Integrated Approach to Testing Divergence with Gene Flow Model of Speciation; Empirical Genomics: Simulation, and In Silico Evolution (2011 to 2012) BEACON Budget Request NSF DBI 0939454. \$40,600 total (PI: J Sullivan)

R Pennock, C Ofria, JA Foster, JL Graves, J Smith, B Swalla, C Wilke, BEACON: Avida-ED Infrastructure Maintenance and Development (2011 to 2012) BEACON Budget Request NSF DBI 0939454. \$52,141 total (PI: R Pennock)

JA Foster, ML Day, G Dozier, C Ofria, BEACON: Teaching evolution through action: the AVIDA challenge (2011 to 2012) BEACON Budget Request NSF DBI 0939454. \$27,500 total (PI: JA Foster)

C Bohach, Idaho INBRE Program (2005 to 2012) NIH INBRE P20RR016454. \$20,690,108 total (PI: C Bohach)

LJ Forney, COBRE: Bioinformatics Core Facility (2010 to 2011) NIH COBRE P20RR016448-09. \$123,953 total (PI: LJ Forney)

JA Foster, BEACON: Idaho Administrative budget (2010 to 2011) BEACON Budget Request NSF DBI 0939454. \$100,000 total (PI: JA Foster)

C Bohach, Biomedical Research Infrastructure Network in Idaho (2006 to 2011) NIH INBRE P20RR016454. \$3,064,308 total (PI: C Bohach)

LJ Forney, COBRE: Center for Research on the Processes of Evolution (2001 to 2011) NIH COBRE P20RR016448. \$18,764,760 total / \$11,000,000 direct (PI: LJ Forney)

LJ Forney, COBRE: Bioinformatics Core Facility (2009 to 2010) NIH COBRE P20RR016448-08. \$303,622 total (PI: LJ Forney)

JA Foster, Undergraduate Research Fellowship (2010 to 2010) Bio.Sci. dept. UI . \$1,200 total (PI: JA Foster)

LJ Forney, COBRE: Bioinformatics Core Facility (2008 to 2009) NIH COBRE P20RR016448-07. \$185,598 total (PI: LJ Forney)

J Shreeve, Idaho Research Infrastructure Improvement (2005 to 2009) NSF EPS 0447689. \$9,250,000 total (PI: J Shreeve)

LJ Forney, COBRE: Bioinformatics Core Facility (2007 to 2008) NIH COBRE P20RR016448-06A2. \$239,790 total (PI: LJ Forney)

LJ Forney, COBRE: UID: Proj 4: Computational and mathematical analysis of biomedical data (2007 to 2008) NIH COBRE P20RR016448-06A2. \$381,014 total (PI: LJ Forney)

D Lind, JA Foster, D Keim, Tribal law database enhancement (2003 to 2008) NSF IIS 0326103. \$411,446 total (PI: D Lind)

JA Foster, P Joyce, D Davenport, Scholarships for computer science and mathematics undergraduates (2004 to 2008) NSF DUE 0422525. \$396,000 total / \$396,000 direct (PI: JA Foster)

LJ Forney, COBRE: Bioinformatics Core Facility (2005 to 2006) NIH COBRE P20RR016448-05. \$254,861 total (PI: LJ Forney)

LJ Forney, COBRE: UID: Proj 4: Computational and mathematical analysis of biomedical data (2005 to 2006) NIH COBRE P20RR016448-05. \$404,963 total (PI: LJ Forney)

M Laskowski, C Bohach, M Thomas, J Oxford, JA Foster, Idaho INBRE Bioinformatics Core (2001 to 2006) NIH INBRE P20RR016454. \$2,067,144 total (PI: M Laskowski)

LJ Forney, COBRE: UID: Bioinformatics Core Facility (2004 to 2005) NIH COBRE P20RR016448-04. \$262,515 total (PI: LJ Forney)

LJ Forney, COBRE: UID: Proj 4: Computational and mathematical analysis of biomedical data (2004 to 2005) NIH COBRE P20RR016448-04. \$417,125 total (PI: LJ Forney)

M Laskowski, C Bohach, JA Foster, J Oxford, M Thomas, Idaho INBRE Program (2003 to 2005) NIH BRIN P20RR016454. \$12,864,478 total (PI: M Laskowski)

LJ Forney, Microbial ecology of the human vagina and vulva: Phase II, III (2001 to 2004) Proctor and Gamble . \$287,066 total (PI: LJ Forney)

LJ Forney, COBRE: Bioinformatics Core Facility (2003 to 2004) NIH COBRE P20RR016448-03. \$130,856 total (PI: LJ Forney)

LJ Forney, COBRE: Computational and mathematical analysis of biomedical data (2003 to 2004) NIH COBRE P20RR016448-03. \$409,170 total (PI: LJ Forney)

LJ Forney, COBRE: Bioinformatics Core Enhancements (2004 to 2004) NIH COBRE P20RR016448-04. \$476,416 total (PI: LJ Forney)

JA Foster, Conference support for GECCO (2003 to 2003) NSF IIS 0314012. \$15,000 total (PI: JA Foster)

LJ Forney, COBRE: Bioinformatics Core Facility (2001 to 2003) NIH COBRE P20RR016448. \$428,913 total (PI: LJ Forney)

LJ Forney, COBRE: Computational and mathematical analysis of biomedical data (2001 to 2003)

NIH COBRE P20RR016448. \$806,136 total (PI: LJ Forney)

JA Foster, Book Donation (2003 to 2003) Kluwer Publishers . \$3,500 total (PI: JA Foster)

JA Foster, Conference support for GECCO (2003 to 2003) ONR/NRL . \$5,000 total (PI: JA Foster)

JA Foster, Conference support for GECCO (2003 to 2003) AFOSR . \$10,000 total (PI: JA Foster)

M Laskowski, C Bohach, M Thomas, J Oxford, JA Foster, Biomedical Research Infrastructure Network in Idaho (2000 to 2003) NIH BRIN P20RR016454. \$8,184,982 total (PI: M Laskowski)

JA Foster, Multidisciplinary Studies in Bioinformatics and Evolutionary Studies (2000 to 2002) NSF EPS 0080935. \$499,994 total (PI: JA Foster)

J Alves-Foss, JA Foster, Robustness analysis of evolved hardware (1998 to 2001) DOD/OST . \$382,558 total (PI: J Alves-Foss)

J Alves-Foss, JA Foster, Security Implications of Quantum Technologies (1998 to 2001) NSA URP MDA904-98-C-A894. \$201,000 total / \$201,000 direct (PI: J Alves-Foss)

JA Foster, Viral evolution; computer science and molecular biology (1998 to 2000) NIH NIGMS F33GM20122. \$91,568 total (PI: JA Foster)

PW Oman, Secure and Reliable Software (1998 to 2000) DOD/OST . \$500,000 total (PI: PW Oman)

JA Foster, Algorithms for Machine Learning (1998 to 1999) Idaho Space Grant Consortium . \$5,000 total (PI: JA Foster)

D Frincke, JA Foster, Survivability in Software (1998 to 1999) NASA . \$25,000 total (PI: D Frincke)

JA Foster, International Conference on Genetic Algorithms (1997 to 1997) UI/URO Travel . \$900 total (PI: JA Foster)

JA Foster, Foundations of Genetic Programming and Genetic Algorithms (1996 to 1996) UI/URO Travel . \$900 total (PI: JA Foster)

JA Foster, Solving Optimization Problems with Genetic Algorithms and Groupings (1994 to 1995) UI/URO Seed . \$6,000 total (PI: JA Foster)

JA Foster, Computer Simulation of Molecular Evolution (1995 to 1995) ID/EPSCoR . \$2,983 total (PI: JA Foster)

JA Foster, Computer Simulation of the Activity of Mammalian Transposable Elements (1994 to 1994) ID/EPSCoR . \$3,000 total (PI: JA Foster)

JA Foster, M Barnett, Computer Simulation of Transposable Elements (1993 to 1994) ID/SBOE Small Research Grant . \$35,000 total (PI: JA Foster)

JA Foster, M Barnett, Colonizing Cyberspace: The Ethical Frontier (1994 to 1994) GTE . \$5,000 total (PI: JA Foster)

JA Foster, DIMACS Challenge on Combinatorial Optimization (1993 to 1993) NSF . \$400 total (PI: JA Foster)

JA Foster, Genetic Algorithms and Approximations (1992 to 1993) UI/URO Seed . \$6,000 total (PI: JA Foster)

JA Foster, Data Compression Conference (1993 to 1993) UI/URO Travel . \$900 total (PI: JA Foster)

JA Foster, Federated Computing Conference (1992 to 1992) ID/ISGC Idaho Space Grant Consortium. \$1,500 total (PI: JA Foster)

JA Foster, Dense Properties and Generic Sets for The Polynomial Hierarchy (1991 to 1992) ID/EPSCoR . \$4,200 total (PI: JA Foster)

JA Foster, International Conference on Computing and Information (1992 to 1992) UI/URO Travel . \$600 total (PI: JA Foster)

JA Foster, International Conference on Automata, Languages and Programming (1991 to 1991) UI/URO Travel . \$600 total (PI: JA Foster)

JA Foster, Equipment for Computer Graphics (1989 to 1990) Donation Science Research Associates, Division of IBM. \$25,000 total (PI: JA Foster)

JA Foster, Generic Sets and the Polynomial Hierarchy (1989 to 1990) NIU Res. Grant . \$5,120 total

(PI: JA Foster)

PAST FUNDING, OTHER

REJECTED (PARTIAL, DATES AND AMOUNTS APPROXIMATE)

PE Gessler, JA Foster, IGEM Proposal: Informatics and Data Science for Complex Systems (2015) Idaho SBOE IGEMS/HERC program . \$2,000,000 total (PI: PE Gessler)

B Robison, JA Foster, M Reyes, E Top, NRT-DESE: Developing protean scientists: a graduate training program for the investigation of complex biological systems. (2014 to 2014) NSF NRT 7485777. \$2,800,000 total / \$1,800,000 direct (PI: B Robison)

D Stenkamp, NIH-BUILD Undergraduate Research (2014 to 2014) NIH BUILD . \$3,000,000 total / \$3,000,000 direct (PI: D Stenkamp)

DL Crawford, RL Crawford, JA Foster, IGERT: Interdisciplinary graduate training in molecular ecology and environmental genomics (2004 to 2014) NSF Preproposal 0437000. \$3,082,260 total (PI: DL Crawford)

P Hartzell, Revamp Undergrad curriculum (2014 to 2014) NSF . \$1,000,000 total / \$600,000 direct (PI: P Hartzell)

MK McGuire, JA Foster, Proof-of-Concept: Consumption of Conventional Yogurt During Pregnancy and Lactation Influences Maternal & Infant Gastrointestinal Microbiomes (2013 to 2013) Dairy Research Institute . \$0 total (PI: MK McGuire)

JA Foster, IGERT White Paper: Novel Graduate Training of Data Scientists for Complex Systems Research (2013 to 2013) UI Research Office Internal call for white papers. \$0 total (PI: JA Foster)

Z Abdo, S Datta, L Harmon, JA Foster, Modeling the microbial community dynamics and ecology of the human microbiome: focus on the vaginal system (2011 to 2011) Keck Foundation . \$984,923 total / \$984,923 direct (PI: Z Abdo)

Z Abdo, S Datta, L Harmon, JA Foster, Post genomic modeling (2011 to 2011) Keck Foundation UI Internal competition. \$984,923 total / \$984,923 direct (PI: Z Abdo)

JA Foster, Experimental model systems of ecosystem complexity (2011 to 2011) Templeton foundation . \$287,753 total (PI: JA Foster)

JA Foster, Relationships among time postpartum, related factors, and human milk microbiome (2011 to 2011) NIH R21 . \$383,695 total (PI: JA Foster)

D Lind, JA Foster, Tribal Law Exchange (2011 to 2011) NEH . \$295,270 total (PI: D Lind)

JA Foster, Next generation sequencing bioinformatics (2010 to 2011) NIH S10 . \$404,600 total / \$404,600 subcontract (PI: JA Foster)

JA Foster, MD Day, Interfacial phenomena between biofilms and minerals at physiochemical extremes (subcontract) (2011 to 2011) Idaho State U. . \$173,439 total (PI: JA Foster)

MA McGuire, MK McGuire, The microbiome of human milk (2011 to 2011) NIH R21 . \$383,695 total (PI: MA McGuire)

JA Foster, Next generation sequencing bioinformatics (2009 to 2010) NIH S10 . \$498,425 total / \$498,425 subcontract (PI: JA Foster)

JA Foster, MRI: Acquisition of Computing Infrastructure for Evolutionary Biology (2009 to 2010) NSF MRI 0958751. \$500,000 total / \$500,000 direct / \$500,000 subcontract (PI: JA Foster)

MK McGuire, MA McGuire, Microbial ecology of human mastitis (2010 to 2010) Gates foundation . \$100,000 total (PI: MK McGuire)

LP Waits, RJ Dezzani, JA Foster, LA Vierling, Advancing research and teaching in the newly emergent field of landscape genetics using simulated and empirical data sets (2008 to 2008) NSF DEB. \$337,952 total (PI: LP Waits)

JA Foster, Acquiring high precision, efficient evol-modelling cluster computer (2005 to 2006) NSF MRI . \$1,680,559 total / \$500,000 direct (PI: JA Foster)

JA Foster, Limitations of progressive multiple sequence alignment algorithms (2005 to 2005) NSF

DBI. \$778,985 total (PI: JA Foster)

JA Foster, Predoctoral training in bioinformatics/computational biology (2004 to 2004) NIH NIGMS T32 072485. \$1,844,848 total (PI: JA Foster)

DL Crawford, T Hess, JA Foster, Constructing efficient microbial consortia using evolutionary algorithms (2003 to 2004) NSF DEB. \$1,848,568 total (PI: DL Crawford)

PENDING AS PI, CO-PI, OR KEY PERSONNEL

JA Foster, Enhancing Predoctoral Training for Trainees with Non-Academic Career Goals (2017 to NIH T32 4049632. \$1,037,133 total / \$996,993 direct (PI: JA Foster)

PENDING, OTHER

PRESENTATIONS

INVITED TALKS

1. JA Foster (Jan 2016) Combining bacterial fingerprints: A new algorithm. Medical School, University of Hawaii, Honolulu, HI
2. JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. College of Idaho, Caldwell, ID
3. JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. Northwest Nazarene University, Nampa, ID
4. JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. Boise State University, Boise, ID
5. B Baumgaertner, JA Foster (Oct 2015) Imperfect Observations Produce Asymmetric Signaling Roles. Northwest Philosophy Conference, Coeur Coeur D'Alene, ID
6. JA Foster (Jul 2015) Combining bacterial fingerprints: A new algorithm. FASEB, Big Sky, MT
7. JA Foster (Jul 2015) Combining bacterial fingerprints: A new algorithm. National meeting of the American Chemical Society, Pocatello, ID
8. JA Foster (Jun 2014) Research cores as businesses. NIH NISBRE, Washington DC
9. JA Foster (May 2014) Combining bacterial fingerprints: A new algorithm. UI CS Seminar, University of Idaho, Moscow ID
10. IY Zhbannikov, SS Hunter, H Mendes-Soares, R Hickey, JA Foster, M Settles (Sep 2013) BALMNet: Biologically associated text miner and network builder. ACM International Conference on Bioinformatics, Computational Biology, and Biomedical Informatics (ACM BCB 2013), Washington, DC. 22-25 September 2013
11. IY Zhbannikov, M Settles, SS Hunter, JA Foster (May 2013) SlopMap: a software application tool for quick and flexible identification of similar sequences using exact k-mer matching. Inland Northwest Genomics Symposium, Moscow, ID
12. IY Zhbannikov, M Settles, SS Hunter, JA Foster (Nov 2012) How many viruses are there in a pig?. NH INBRE visit to GBCC, Great Bend Community College, as part of visit to NH INBRE
13. JA Foster (Apr 2012) How many viruses are there in a pig: new inferential statistics for metagenomic data. CS Colloquium, University of Idaho, Moscow ID
14. JA Foster (Sep 2010) The human milk microbiome: Healthy breasts, mothers and babies. Geisel School of Medicine, Dartmouth College, Hanover, NH
15. JA Foster (Jun 2005) Evolving multiple sequence alignments. Washington State University, Pullman WA
16. JA Foster (Nov 2004) Evolving multiple sequence alignments with Evalyn. Idaho State University, Pocatello, ID
17. JA Foster (Jun 2004) Evolving multiple sequence alignments with Evalyn. Limerick University, Ireland

18. JA Foster (Jun 2004) Evolving multiple sequence alignments with Evalyn. U. Wyoming, Laramie, WY
19. JA Foster (Jun 2004) Tutorial: Biological applications of genetic and evolutionary computation. Parallel Problem Solving from Nature (PPSN 8), Birmingham, UK
20. JA Foster (Jun 2004) Tutorial: Biological applications of genetic and evolutionary computation. Genetic and Evolutionary Computation Conference, Seattle
21. JA Foster (Jun 2003) Evolutionary computation for multiple sequence alignment. U. Arkansas Little Rock. Little Rock, AR, Jan
22. C Shyu, JA Foster (Jun 2003) Evolving consensus sequences for multiple sequence alignment with a genetic algorithm. Idaho BRIN meeting, Moscow, ID
23. JA Foster (Jun 2003) Life of an Eccentric: Truly interdisciplinary studies. Idaho Phi Beta Kappa society, Moscow, ID
24. JA Foster (Jun 2002) IBEST: forming an interdisciplinary bioinformatics research group. National EPSCoR meeting, Anchorage, AK
25. JA Foster (Jun 2001) Genetic programming: building programs without using programmers. Microsoft research, Seattle, WA
26. JA Foster (Jun 2000) Experimental evolution with x174 bacteriophage. Dagstuhl workshop on Bioinformatics, Germany
27. JA Foster (Jun 2000) Using evolution in computation. Evolution meetings, Bloomington, IN
28. JA Foster (Jun 1999) Experimental evolution with x174 bacteriophage. Dagstuhl workshop on Evolutionary Computation Theory, Germany
29. JA Foster (Jun 1998) Realism and anti-realism in mathematics. Inland Northwest Philosophy Conference on Realism and Anti-Realism, Moscow, ID
30. JA Foster (Jun 1997) The C-value paradox and implications for evolutionary computation. International Conference On Genetic Algorithms, Workshop on Variable Length Encodings, Orlando, FL
31. JA Foster (Jun 1993) Inductive inferencing: Models and results. Griffith University, Brisbane, Australia
32. JA Foster (Jun 1991) Dense properties and generic witnesses. Illinois Institute of Technology, Chicago, IL
33. JA Foster (Jun 1990) Forcing and genericity on the polynomial hierarchy. Washington, Ontario, British Columbia, Alberta Theory Seminar (WOBCATS), Banff, BC

CONFERENCE TALKS

1. JA Foster (Jan 2016) Combining bacterial fingerprints: A new algorithm. Pacific Symposium on Biocomputing, Kohala, HI
2. JA Foster, M Barnett, C Cassavant, J Clough, RW Ireland, HA Wichman (Jun 1995) Computer aided simulation of transposable element evolution. EVOL 95,
3. JA Foster (Jun 1995) Exploring the polynomial hierarchy with generic sets. Int. Conf. On Computing and Information, Toronto, CA
4. JA Foster, PW Oman, K Van Houten, W Zhu (Jun 1995) Using self delimiting strings to represent trees. Southeastern International Conference on Graph Theory, Combinatorics and Computing, Boca Raton, FL
5. M Barnett, C Cassavant, J Clough, A Edwards, JA Foster, HA Wichman (Jun 1994) Transposable element computer aided simulation: a first attempt. SINEs, LINEs and Retrotransposable Elements: Functional Implications, Tahoe, CA
6. JA Foster, PW Oman, K Van Houten (Jun 1993) Representing tree structures as binary strings. Southeastern International Conference on Graph Theory, Combinatorics and Computing, Boca Raton, FL

POSTER PRESENTATIONS

1. PM Vaelli, KR K Theis, EJ Coddington, JA Foster, H Eisthen (Jun 2017) Symbiotic bacteria underlie toxin production and voltage-gated sodium channel evolution in the rough-skinned newt (*Taricha granulosa*). Gordon Research Conference on Neuroethology, Les Diablerets, Switzerland
2. SL Brooker, JE Williams, K Davenport, L Bode, JA Foster, MA McGuire, MK McGuire, BM Murdoch (May 2016) Has evolution of human milk sugars responded to a biocultural sweet tooth?. Inland Northwest Genomics Research Symposium, Moscow, ID
3. SL Brooker, JE Williams, K Davenport, L Bode, JA Foster, MA McGuire, MK McGuire, BM Murdoch (May 2016) Has evolution of human milk sugars responded to a biocultural sweet tooth?. Inland Northwest Genomics Research Symposium, Moscow, ID
4. P Fetros, C Britson, B Baumgaertner, JA Foster (Oct 2015) How to Tell When Ambiguous Signalling is Better than Guessing. IBEST Undergraduate Research, Moscow, ID
5. SL Brooker, JE Williams, K Davenport, L Bode, JA Foster, MA McGuire, MK McGuire, BM Murdoch (Aug 2015) Has evolution of human milk sugars responded to a biocultural sweet tooth?. BEACON Congress, East Lansing, MI
6. SL Brooker, JE Williams, K Davenport, L Bode, JA Foster, MA McGuire, MK McGuire, BM Murdoch (Aug 2015) Has evolution of human milk sugars responded to a biocultural sweet tooth?. FASEB Origins and Benefits of Biologically-Active Components of Human Milk, BIG Big Sky, MT
7. IY Zhbannikov, JE Williams, JA Foster (May 2014) MetAmp: a novel approach to clustering analysis of microbial community structures using multiple genomic fingerprints. Inland Northwest Genomics Symposium, University of Idaho, Moscow ID
8. DL Beck, JA Foster (Oct 2013) Machine learning techniques accurately classify microbial communities by bacterial vaginosis characteristics. IBEST Research Symposium, UI, Moscow, ID
9. IY Zhbannikov, SS Hunter, H Mendes-Soares, R Hickey, JA Foster, M Settles (Sep 2013) BALMNet: Biologically associated text miner and network builder. ACM International Conference on Bioinformatics, Computational Biology, and Biomedical Informatics (ACM BCB 2013), Washington, DC. 22-25 September 2013
10. P Vasili, JA Foster, K Theis, H Eisthen, JE Williams (Aug 2013) Isolation and characterization of bacteria associated with the neurotoxic rough-skinned newt, *Taricha granulosa*. BEACON Congress, MSU, East Lansing, MI
11. IY Zhbannikov, M Settles, SS Hunter, JA Foster (May 2013) SlopMap: a software application tool for quick and flexible identification of similar sequences using exact k-mer matching. Inland Northwest Genomics Symposium, Moscow, ID
12. IY Zhbannikov, D Tank, JW Brown, JA Foster (Apr 2013) decisivatoR: an R package that addresses the problem of phylogenetic decisiveness. IBEST Science Update Series, Moscow, ID
13. IY Zhbannikov, SS Hunter, H Mendes-Soares, JA Foster, M Settles (Mar 2013) BALMNet: Biologically associated text miner and network builder. Idaho Academy of Science, Pocatallo, ID
14. JA Foster, W Schroeder (Oct 2012) Extensive IBEST interactions transcend college and university boundaries. First annual IBEST research Symposium, University of Idaho, Moscow ID
15. IY Zhbannikov, M Settles, SS Hunter, JA Foster (Oct 2012) SeqyClean as a novel approach in next generation sequencing cleaning. First annual IBEST research Symposium, University of Idaho, Moscow ID
16. DL Beck, JA Foster (Oct 2012) Using machine learning techniques to classify microbial communities. First annual IBEST research Symposium, University of Idaho, Moscow ID
17. IY Zhbannikov, JA Foster, M Settles (Aug 2012) Vaginal microbiome biological network constructed by processing PubMed abstracts. BEACON NSF Site Visit poster session, MSU, East Lansing, MI
18. HK Allen, J Bunge, JA Foster, BA Stanton (Jun 2012) Estimating richness from phage metagenomes. ASM General Meeting, San Francisco, CA
19. D Tabish, M Raish, DL Beck, P Hohenlohe, JA Foster, MD Day (May 2012) Validation of the OpenPCR using multiplex PCR and open hardware. Biological Sciences Undergraduate Research Symposium, University of Idaho, Moscow ID
20. D Tabish, M Raish, DL Beck, P Hohenlohe, JA Foster, MD Day (May 2012) Validation of the

OpenPCR using multiplex PCR and open hardware. UI Undergraduate Poster Competition, April 2012

21. JC Madan, D Koestler, BA Stanton, L Davidson, JH Moore, M Sogin, H Morrison, T Hampton, PE Palumbo, M Guill, RC Salari, MR Karagas, JA Foster, GA O'Toole Jr, PL Hibberd (Apr 2012) The impact of dietary and medical interventions on the developing lung and intestinal microbiota in infants with Cystic Fibrosis. Pediatric Academic Society, Boston, MA
22. JC Madan, D Koestler, BA Stanton, L Davidson, JH Moore, M Sogin, H Morrison, T Hampton, PE Palumbo, M Guill, RC Salari, MR Karagas, JA Foster, GA O'Toole Jr., PL Hibberd (Apr 2012) The impact of dietary and medical interventions on the developing lung and intestinal microbiota in infants with Cystic Fibrosis. Integrated Biology Symposium on the Microbiome, Dartmouth College, Hanover, NH
23. JC Madan, PE Palumbo, GA O'Toole Jr, JA Foster, JH Moore (Jun 2011) The premature neonatal microbiome in sepsis and in health. FASEB meeting on probiotics and the microbiome, Washington DC
24. JA Foster (Nov 2010) IBEST has had national impact. NIH NISBRE, Bethesda MD
25. JA Foster (Oct 2010) 17 years of sustained high performance interdisciplinarity (IBEST). Enhancing Communications in Cross Disciplinary Research, Coeur D'Alene, ID
26. JA Foster (Aug 2010) The Milk Microbiome: healthy mothers, breasts and babies. Idaho INBRE annual meeting, Moscow, ID
27. MD Day, JA Foster (Aug 2010) Artificial ecosystem selection. Idaho INBRE annual meeting, University of Idaho, Moscow ID
28. DL Beck, JA Foster (Aug 2010) OTUbase: an R package for OTU data analysis. Idaho INBRE annual meeting, Moscow, ID
29. KM Hunt, MK McGuire, JA Foster (Aug 2010) The core milk microbiome. Idaho INBRE annual meeting, University of Idaho, Moscow ID
30. JA Foster (Mar 2010) IBEST Bioinformatics and Sequencing Cores. Post Genomics Technology for Biological Discovery, Santa Fe, NM
31. JA Foster, M Settles, R Lyon (Mar 2010) IBEST Bioinformatics and Sequencing Cores. Association for Biological Research Facilities, Sacramento, CA
32. LJ Sheneman, JA Foster (Jun 2003) EVALYN: Evolving guide trees for progressive multiple sequence alignment. Biology 545 poster session, Moscow, ID
33. LJ Sheneman, JA Foster (Jun 2003) Evolving better alignments. COBRE meeting, Moscow, ID
34. LJ Sheneman, HA Wichman, J Sullivan, JA Foster (Jun 2003) Generating MSA algorithm test cases by manipulation of real mitochondrial DNA sequences. COBRE meeting, Moscow, ID
35. C Shyu, JA Foster (Jun 2003) Nonparametric approaches for inferring microbial community structures based on terminal restriction fragment length polymorphisms (T-RFLP). Idaho COBRE, Moscow, ID
36. J Evans, JA Foster (Jun 2003) Searching phylogenetic tree space efficiently. COBRE meeting, Moscow, ID
37. J Evans, JA Foster (Jun 2003) Tabu Search: A fast heuristic search algorithm for large data sets. Biology 545 poster session, Moscow, ID
38. JA Foster, JS Shoaf (Jun 1996) A genetic algorithm solution to the efficient set problem: A technique for portfolio selection based on the Markowitz model. Idaho Academy of Science, 38th Annual Meeting, Idaho
39. T Soule, JA Foster (Jun 1996) Code growth in genetic programming. Idaho Academy of Science, 38th Annual Meeting, Idaho
40. JA Foster, RW Ireland, M Barnett, HA Wichman, C Cassavant, J Clough (Jun 1996) Computer aided simulation of transposable element evolution. Idaho Academy of Science, 38th Annual Meeting, Idaho
41. JA Foster (Jun 1996) Introduction to genetic algorithms and genetic programming. Idaho Academy of Science, 38th Annual Meeting, Idaho
42. JA Foster (Jun 1996) Stochastic algorithms and approximations: Implications for genetic algorithms. Idaho Academy of Science, 38th Annual Meeting, Idaho

43. T Soule, JA Foster (Jun 1996) Using genetic algorithms to solve maximum clique. Idaho Academy of Science, 38th Annual Meeting, Idaho

OTHER PRESENTATIONS

ADVISING AND MENTORING

UNDERGRADUATE RESEARCH

- Peter Fetros, B.S., Electrical and Computer Engineering (In Progress) *Simulations of Signaling Games*
- Damien Tabish, B.S., Biological Sciences (Oct 2012) *Develop commodity PCR*
- Bryanna Laurea, B.A., English (Sep 2012) *Developing the ginger beer plant as a model ecosystem*
- Marissa Raish, Biological Sciences (Jul 2012) *Develop winnogradsky column protocol*
- Matthew Maw, B.A., Theater (Jun 2010) *Bioethics project: embryological sentience and moral agency*
- Staniella Nikolova, B.S., Biological Sciences (Jun 2010) *Bioethics project: embryological sentience and moral agency*
- Alison Robinson, B.S., Biological Sciences (Jun 2010) *Bioethics project: embryological sentience and moral agency*
- Jessica Wilson, B.S., Biological Sciences (Jun 2010) *Bioethics project: human relationships and physician assisted suicide*
- Jeremy Wilson, B.A (Jun 2010) *Bioethics project: human relationships and physician assisted suicide*
- Jordan Gray, B.S., Biological Sciences (Jun 2009) *Bioethics club formation*
- Paul Joritsma, B.A., Political Science (Jun 2009) *Bioethics club formation*
- Aussie Robnett, B.A., Political Science (Jun 2009) *Bioethics club formation*
- Cody Britson, B.A., Philosophy (Jul 2006) *Philosophy of Signaling Games*
- John Brunsfeld, B.S., Computer Science (Jun 2006) *Transposable element evolution: the simulator*
- John Harrison, B.S., Computer Science (Jun 2004) *Cloner: utility for using Beowulf clusters*
- John Cavalieri, B.S., Computer Science (Jun 2001) *Evolutionary Hardware: Tree Encoding of Sorting Circuits, Computer Simulations*
- Chad Creighton, B.S., Computer Science (Jun 2000) *Bioinformatics: databases and simulations*
- Gerard Guo, B.S., Computer Science (Jun 2000) *Evolutionary Drug Design*
- Zach Saul, B.S., Computer Science (Jun 2000) *Genetic Programming Robustness*
- Kevin Scott, B.S., Computer Science (Jun 2000) *Evolutionary Hardware: Direct Encoding of Sorting Circuits*
- Brad Hakala, B.S., Computer Science (Jun 1999) *Artificial Societies*
- Chris Hall, B.S., Computer Science (Jun 1999) *Artificial Societies*
- Zach Libby, B.S., Computer Science (Jun 1999) *Artificial Societies*
- Ian Russell, B.S., Computer Science (Jun 1999) *Artificial Societies*
- Abe Haight, B.S., Computer Science (Jun 1998) *Computer Simulations, Computational Biology*
- Jamie Marconi, B.S., Computer Science (Jun 1998) *Evolutionary Computation and Keller Graphs*
- Lisa Wright, B.S., Computer Science (Jun 1998) *Evolutionary Hardware*
- Ray Saxe, B.S., Computer Science (Jun 1997) *Graphical User Interface Design*
- Noah Sutherland, B.S., Computer Science (Jun 1997) *Computational Biology*
- Wesley Ireland, B.S., Computer Science (Jun 1996) *Computer Simulations, Computational Biology*
- Sean Jones, B.S., Computer Science (Jun 1996) *Graphical User Interface Design*

James Clough, B.S., Computer Science (Jun 1995) *Computer Simulations, Cryptography, Computational Biology*

James Coleman, B.S., Computer Science (Jun 1995) *Neural Networks*

Jason Sampson, B.S., Computer Science (Jun 1995) *Computer Simulations, Computational Biology, User Interfaces*

Luke Sheneman, B.S., Computer Science (Jun 1995) *Formal Methods, Computational Biology*

Brian Kramer, B.S., Computer Science (Jun 1994) *Adaptive Searching, Machine Learning, Genetic Algorithms*

Henry Mullian, B.S., Computer Science (Jun 1993) *Skip Binary Search Trees*

GRADUATE STUDENTS

Ilya Zhbannikov, Bioinformatics and Computational Biology, Ph.D (May 2015) *Preprocessing Algorithms and Software for Genomic Studies with High-Throughput Sequencing Data*

Daniel Beck, Bioinformatics and Computational Biology, Ph.D (Apr 2014) *Classifying disease risk from microbial community composition*

Luke Sheneman, Bioinformatics and Computational Biology, Ph.D (Jun 2008) *Multiple sequence alignment algorithms*

Conrad Shyu, Bioinformatics and Computational Biology, Ph.D (Jun 2006) *Evolutionary Computation in Bioinformatics*

Barry Ahrens, Computer Science, M.S (Jun 2005) *Superresolution algorithms*

Gerard Goh, Computer Science, Ph.D (Jun 2005) *Detecting Protein Flexibility*

Mike Harrison, Computer Science, M.S (Jun 2004) *Robustness of evolved systems*

Mark Meysenburg, Computer Science, Ph.D (Aug 2002) *How Random Number Generator Quality Affects Simple Genetic Algorithm Performance*

Kosuke Imamura, Computer Science, Ph.D (Jun 2002) *N-Version Genetic Programming: a Probabilistically Optimal Ensemble Approach*

Robert Shepherd, Computer Science, M.S (Jun 2002) *Fault Tolerance in Evolved Sorting Networks: the Search for Inherent Robustness*

Bart Rylander, Computer Science, Ph.D (Jun 2001) *Complexity of Evolutionary Computation*

John Determan, Computer Science, M.S (Jun 2000) *Automatic Expert System Rule Generation On Nondestructive Waste Assay Data*

Jason Masner, Computer Science, M.S (Jun 2000) *Evaluating the Cost of Evolved Hardware*

Brad Harvey, Computer Science, M.S (Jun 1999) *Byte Code Genetic Programming and Its Application to Data Mining*

Mark Pokorny, Computer Science, M.S (Jun 1998) *Evolutionary Computation and Neural Nets*

Jackie Shoaf, Computer Science, M.S (Jun 1998) *Evolutionary Computation in Stock Portfolio Selection*

Terry Soule, Computer Science, Ph.D (Jun 1998) *Code Bloat and Genetic Programming*

Tsuey Fen Kuo, Computer Science, M.S (Jun 1989) *Static and Dynamic Huffman Coding*

Zhu Ouyang, Computer Science, M.S (Jun 1989) *Network Layer Routing Algorithm Feedback Routing*

GRADUATE STUDENT COMMITTEES

Sarah Brooker, Bioinformatics and Computational Biology, Ph.D (In Progress) *Genomics of lactation*

Joseph DeAgüero, Bioinformatics and Computational Biology, Ph.D (In Progress) *Mathematical modeling of multiple viral infections*

Victoria DePalma, Environmental Sciences, Ph.D (In Progress) *Virtue ethics and biodiversity*

Mariah Eckwright, Bioinformatics and Computational Biology, M.S (In Progress) *Mathematical modeling of microbial communities*

Kennetta Nunn, Bioinformatics and Computational Biology, Ph.D (In Progress) *Lactobacilli physiology in the vaginal microbiome*

Genevieve Metzger, Bioinformatics and Computational Biology, Ph.D (Aug 2016) *Multi host plasmid genomics*

Tyler Hether, Bioinformatics and Computational Biology, Ph.D (Jun 2016) *Genomic organization in vivo and in simulations*

Roxanne Hickey, Bioinformatics and Computational Biology, Ph.D (Jun 2015) *The vaginal microbiome*

Josh Rubini, Computer Science, M.S (Jun 2015) *Evolving mobile robot controllers*

Kelsie Evans, Plant, Soils, Entomological Science, M.S (Jun 2014) *Potato virus genomics*

Yang Lei, Bioinformatics and Computational Biology, Ph.D (Jun 2014) *Genomics of LINE-1 transposable elements*

Vanhana Krishnan, Bioinformatics and Computational Biology, M.S (Jun 2013) *Bioinformatics for genomics of biofilms*

Al Carlson, Computer Science, Ph.D (Jun 2012) *Computer Security*

Katherine Hunt, Animal Physiology, Ph.D (Jun 2012) *The human milk microbiome and human milk oligosaccharides*

Matt Settles, Bioinformatics and Computational Biology, Ph.D (Jun 2011) *New algorithms for genomics analysis*

Dan Evans, Computer Science, Ph.D (Jun 2009)

Jason Evans, Bioinformatics and Computational Biology, Ph.D (Jun 2009) *Algorithms for phylogenetic analysis*

Xue Zhong, Bioinformatics and Computational Biology, Ph.D (Jun 2009) *Mathematical Modeling*

Audra Johnson, Bioinformatics and Computational Biology, M.S (Jun 2008) *Bioinformatics for genomics analysis*

Sam Ma, Computer Science, Ph.D (Jun 2008) *Resilient computer systems*

Jorge Williams, Computer Science, Ph.D (Jun 2008) *Accelerated hardware and visualization*

Janet Williams, University of Idaho, Ph.D (Jun 2008) *Microbiome Bioinformatics*

Stephen Bent, Bioinformatics and Computational Biology, Ph.D (Jun 2007) *Microbial diversity of biofilms*

Mitch Day, ISU Biology, Ph.D (Jun 2007) *Microbial ecosystems in simulation and experimental evolution*

Stanley Gottshall, Computer Science, Ph.D (Jun 2007) *Genetic Programming*

Jason Stevens, Computer Science, M.S (Jun 2007) *Genetic Programming*

Shanyu Zheng, Computer Science, Ph.D (Jun 2006) *Computer Security*

Sairamesh Konduri, Electrical Engineering, M.S (Jun 2004) *VLSI design*

Scott Smith, EE, Ph.D (Jun 2004)

YingYin Chen, Computer Science, M.S (Jun 2003) *Evolutionary Computation*

Milos Manic, Computer Sciences, Ph.D (Jun 2003) *Intrusion detection and visualization*

Jennifer Smith, Electrical Engineering, Ph.D (Jun 2003)

Karl Diedrich, MMBB, M.S (Jun 2000) *Microbial Diversity*

Huang, Chemistry, Ph.D (Jun 1999)

Bill Danielson, Computer Science, M.S (Jun 1998) *Computer Security*

Fong Shing Lam, Computer Science, M.S (Jun 1998)
John Streif, Chemistry, Ph.D (Jun 1998) *Raman Spectrography*
James Kruchkow, Anthropology, Ph.D (Jun 1997) *Intrusion detection in computer security*
Terese Meerdink, Math, Ph.D (Jun 1997)
Jamie Theobald, Fisheries and Wildlife Resources, Ph.D (Jun 1997) *Simulating community structure*
Sal Barbosa, Computer Science, M.S (Jun 1996)
Sam Stockett, Math, Ph.D (Jun 1996) *Topology*
Narendram Kattrup, Computer Science, M.S (Jun 1995)
Mike Cohen, Computer Science, M.S (Jun 1993) *Genetic Programming*
Ramona McCall, Computer Science, M.S (Jun 1993)

POSTDOCTORAL SCHOLAR MENTORING

Janet Williams,, Postdoc (In Progress) *Analysis of milk microbiome*
Simon Harding,, Postdoc (Aug 2012) *Evolvable Hardware in Liquid Crystal Displays*
Mitch Day,, Postdoc (Aug 2011) *Artificial Ecosystem Selection*

PEER MENTORING

Bert Baumgaertner, University of Idaho, Department of Philosophy (In Progress) *Junior faculty mentoring*

TEACHING

Class sizes are often approximate.

UNIVERSITY OF IDAHO

Analysis of Algorithms, CS 495/M 405: 1992 (45 app.); 1993 (45 app.); 1994 (45 app.); 1995 (45 app.); 1996 (45 app.); 1997 (45 app.); 1998 (22)
BCB Seminar: Bioinformatics and Computational Biology, BCB 501 : 2009 (12 app.); 2010 (12 app.)
Bioethics, Biol 118: 2005 (30 app.); 2006 (30 app.); 2007 (30 app.)
Bioethics II, Core 168: 2006 (24 app.); 2007 (24 app.); 2008 (24 app.)
Bioinformatics & Evolutionary Studies, CS 404/504: 2000 (15)
Computational biology, BCB 504/510: 2012 (3); 2013 (2); 2014 (1)
Computational Biology, CS 404/504 : 2001 (30 app.); 2005 (30); 2007 (30 app.)
Computational Complexity Theory, CS 596: 1991 (0/8); 1994 (6); 1997 (6 app.)
Computer Skills for Biologists, Biol 404/456: 2010 (0/24); 2012 (3/14); 2014 (16 app.)
CS Graduate Seminar, CS 501 : 1994 (23); 1996 (12 app.); 2003 (12 app.); 2006 (23); 2014 (12 app.)
Data Structures, CS 213: 1990 (38)
Derivational Programming, CS 386: 1997 (12)
Directed Study, CS 499/502 : 1990 to 2006
Evolutionary Biology for non-Biologists, BCB 504/511: 2012 (3); 2013 (3)
Evolutionary Computation, CS 472/572: 1998 (12/5); 1999 (12/2); 2000 (12/2)
Files and Databases, CS 360 : 1992 (21)
Genetic Algorithms, CS 404/504 : 1995 (43)
IBEST Seminar: Bioinformatics, Challenges and Approaches, CS 501: 2001 (60)

IBEST Seminar: Doing evolution, CS 501: 2003 (22)
IBEST Seminar: Explaining evolution, CS 501: 2002 to 2002(14)
Interdisciplinary studies in evolution, BCB 512: 2012 (1); 2013 (1)
Introduction to Computer Science, CS 101 : 1996 (50)
Logic and Computer Science, CS 404/504: 1991 (0/9)
Machine Learning, CS 499/502 : 1998 (9)
MS Research, CS 500 : 1990 to 2006
Perl for bioinformatics, CS 4/504: 2002 (18/0)
Professional Development: Ethics, Bio 553: 2006 (8); 2014 (8); 2015 (8)
Professional Ethics: Bioethics, Phil 316: 2007 (8)
Program Design and Algorithms, CS 113: 1997 (40 app.); 2014 (40 app.); 2014 (40 app.)
Programming Practice, CS 204: 1992 to 2014(12)
Seminar: Machine learning, CS 501 : 1992 (2)
Teaching Practicum, BCB 597: 2010 (1); 2012 (1); 2014 (1)
The Future of Programming, CS 404/504: 1993 (36/0); 1995 (36/0 app.)
Theory of Computation, CS 490/M 485 : 1994 (45 app.); 1996 (45 app.); 1998 (45 app.); 2000 (45 app.); 2002 (50)
Theory of Computation, CS 590: 1993 (20 app.); 1994 (20 app.); 1995 (20 app.); 1996 (20 app.); 1997 (20 app.); 1999 (19); 2003 (20 app.); 2004 (20 app.)

NORTHEASTERN ILLINOIS UNIVERSITY

Advanced Discrete Mathematics, CS 350 New Course: 1998 to 2000
Advanced IBM 370 Assembler Language Programming, CS 306 New Course: 1998 to 2000
Data Structures, CS 304 New Course: 1998 to 2000
Discrete Mathematics, CS 201 New Course: 1998 to 2000
IBM 370 Assembler Language Programming, CS 205 New Course: 1998 to 2000
IBM 370 JCL, CS 218 New Course: 1998 to 2000
MS Thesis research, Thesis research: 2014 to 2000

SERVICE, OUTREACH, PUBLICITY, HONORS

Items are not exhaustive and dates may be approximate.

PROFESSIONAL SERVICE

Associate editor (2015 to now) IEEE Transactions on Evolutionary Computation
Executive committee (1996 to now) European Conference on Genetic Programming (EuroGP)
Thematic editor in chief (2012 to now) Genetic Programming and Evolvable Machines
Associate editor (2003 to now) Genetic Programming and Evolvable Machines
Referee (2000 to now) IEEE Transactions on Evolutionary Computation
Program committee (1995 to now) International Conference on Genetic and Evolutionary Computation (GECCO)
Referee (Pending or In Press,) Journal of Evolutionary Computation
Referee (2005 to now) Journal of Genetic Programming and Evolvable Hardware (GPEM)
External advisory committee (2012 to now) New Hampshire INBRE

External advisor (2014 to now) Wyoming INBRE Bioinformatics Core

Internal advisory board (2002 to 2017) Idaho INBRE

Support (2017) Microbial Population Biology, Gordon Research Conference, as part of BEACON

Steering Committee (2004 to 2017) NIH IDEA Program, National IDEA Core Laboratories (NICL)

Reviewer (2017) Nature Microbiology

Site visit (2015 to 2016) Idaho INBRE Bioinformatics Core, Boise State University, Northwest Nazarine University, College of Idaho

Program committee (2015 to 2016) Ibero-American Conference on Artificial Intelligence

Associate editor (2003 to 2016) Journal of Evolutionary Computation

Study section member (2016) NIH, NCI, Up for a Challenge

Program chair (2016) Pacific Pacific Symposium on Biocomputing, Workshop on Computational approaches to study microbes and microbiomes

Natural sciences representative (2013 to 2015) Idaho State Board of Education, General education core committee

Host, lunch meeting of Bioinformatics Core Directors (2015) Western IDEA meeting, Couer D'Alene, ID

Sponsor (Pending or In Press to 2015) International Herpesvirus Workshop, as UI BEACON director

Steering committee chair (2012 to 2015) European Biological Applications of Evolutionary Computation (EVOBIO), EvoStar conference

Referee (2013 to 2014) Microbiome

Host, site visit (2013) BEACON NSF STC center for the study of evolution in actin

Session chair (2001 to 2013) European Conference on Genetic Programming (EuroGP), EvoStar conference

Program committee (2011 to 2013) Workshop on Artificial Life and Evolutionary Algorithms (ALEA)

Panelist (2013) NSF, IUCRC CISE FRP & CORBI

Program committee (2003, 2007,) Genetic and Evolutionary Computation Conference (GECCO), Genetic programming track

Reviewer (2013) French National Research Academy

Research advisory board (2007 to 2012) Idaho COBRE

Reviewer (2002 to 2012) Natural Sciences and Engineering Research Council of Canada

Reviewer (2004, 2012,) Science Foundation Ireland

Program committee (2012) Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)

Program co-Chair (with Sara Silva) (2011) European Conference on Genetic Programming (EuroGP)

Referee (2008 to 2010) Briefings in Bioinformatics

Associate editor (2003 to 2010) IEEE Transactions on Evolutionary Computation

Permanent study section member (2004 to 2008) NIH, Biomedical Data Management and Analysis

Referee (2006 to 2007) American Naturalist

Panelist (2006) NSF, OSX III

External advisory board (2006) Alaska INBRE

External advisory committee (2006) Nevada INBRE

Guest editor, special issue on best of GECCO (2005) Genetic Programming and Evolvable Machines

Program committee (1995 to 2005) Workshop on Foundations of Genetic Algorithms (FOGA)

Chair (2002, 2003, 2004, 2005, 2014,) Genetic and Evolutionary Computation Conference

(GECCO), Miniconference on Biological Applications
Guest editor, special issue of on evolutionary computation in bioinformatics (2004) Genetic Programming and Evolvable Machines
Program committee (1992 to 2004) International Conference on Genetic Programming (ICGP)
Chair, council on conferences (2003) International Society on Genetic and Evolutionary Computing (ISGEC)
Reviewer (2003) U.K. Engineering and Physical Sciences Research Council
Chair and organizer (2002, 2003,) Idaho BRIN Bioinformatics workshops
Program co-Chair (with Evalyn Lutton) (2002) European Conference on Genetic Programming (EuroGP)
Chair and panelist (1999 to 2002) Genetic and and Evolutionary Computation Conference (GECCO), Graduate Student Workshop
Panelist (2002) NSF, Biological Databases and Informatics (BDI)
Panelist (2002) NSF, Information Technology Research (ITR)
Panelist (2001) NSF, Integrated Graduate Research, Education, Training (IGERT)
Panelist (2001) NSF, Research Infrastructure (RI)
Program committee (1996 to 2000) NASA/JPL Evolvable Hardware conference (EH)
Session chair (1999 to 2000) NASA/JPL Evolvable Hardware Workshop
Responder and Session chair (1998) Inland Northwest Philosophy Conference
Session chair (1998) International Congress on Evolutionary Computation
Program committee (1995, 1996,) International Congress of Evolutionary Computation (CEC)
Program committee (1993 to 1995) International Conference on Genetic Algorithms (ICGA)
Referee (1990 to 1995) Information Processing Letters
Program committee (1992 to 1995) International Conference on Computing and Information (ICCI)
Referee (1990 to 1995) Journal of Discrete Mathematics
Session chair (1994) International Conference on Computing and Information (ICCI)
Referee (1990 to 1991) Journal of Artificial Intelligence Research
Referee (1990 to 1991) Journal of Parallel and Distributed Computing

UNIVERSITY SERVICE

Representative, College of Science (2014 to 2020) University of Idaho, Faculty Senate
Member (2016 to 2017) University of Idaho, President's ad hoc committee on research computing infrastructure
Member (2013) University of Idaho, Graduate and Professional Student (GPSA) award committee
Director (2001 to 2012) IBEST, IBEST bioinformatics core
Panelist (2012) University of Idaho, First annual cyberInfrastructure day
Member, governing board (2006 to 2009) University of Idaho, Bioinformatics and Computational Biology (BCB) graduate program
Director (2003 to 2006) University of Idaho, Bioinformatics and Computational Biology (BCB) degree program
Member (2003 to 2006) University of Idaho, University Wide Programs Interdisciplinary Council
Co-Founder (with Holly Wichman) (1999 to 2003) University of Idaho, Initiative for Bioinformatics and Evolutionary Studies (IBEST)
Member (2001) University of Idaho, Graduate Council

Member (2000) University of Idaho, Critical Thinking Advisory Council
Member (1994 to 1997) University of Idaho, Faculty Affairs Committee
Co-Founder (with P Oman, D Frincke, J Alves-Foss, A Krings, J Munson) (1993) University of Idaho, Center for Secure and Dependable Systems
Member (1991 to 1993) University of Idaho, University Commencement Committee
Member (1988) Northeastern Illinois University, Library Committee

COLLEGE SERVICE

Member (2014 to 2020) University of Idaho, College of Science, Faculty Council
Member (2013, 2014, 2015,) University of Idaho, College of Science, Tenure and Promotions Committee
Chair (2007) University of Idaho, Initiative for Bioinformatics and Evolutionary Studies (IBEST), Core director search committee
Chair (2006) University of Idaho, College of Engineering, Chair evaluation committee
Faculty advisor (2003) University of Idaho, Bioinformatics and Computational Biology (BCB)
Member (2002) University of Idaho, Computer Science, Chair search committee
Member (1997, 2002, 2006,) University of Idaho, College of Engineering, Tenure and Promotions Committee
Member (1998) University of Idaho, College of Engineering, Committee on Student Professional Fees
Chair (1997) University of Idaho, College of Engineering, Faculty Morale Committee
Faculty advisor (1990, 1995,) University of Idaho, College of Engineering, Association for Computing Machinery (ACM), student chapter
Member (1988) Northeastern Illinois University, Computer Science, Curriculum Committee

DEPARTMENTAL SERVICE

Member (2015 to now) University of Idaho, Biological Sciences Department, Undergraduate Affairs Committee
Chair (2016) University of Idaho, Biological Sciences, Promotion committee for Celeste Brown
Chair and member (2015) University of Idaho, Biological Sciences, Tenure and promotion committee for Chris Marx
Member (2013) University of Idaho, Biological Sciences, Tenure and promotion committee for Dave Tank
Member (2012) University of Idaho, Biological Sciences, Tenure and promotion committee for Scott Nuismer
Seminar committee, Biological Sciences (2011) University of Idaho, Biological Sciences, Seminar committee
Member (2010) University of Idaho, Biological Sciences, Third year review committee for Onesmo Ballemba
Chair (2002) Search committee for IBEST system administrator, Initiative for Bioinformatics and Evolutionary Studies (IBEST)
Member (2002) University of Idaho, Computer Science, Space Committee
Chair (2001) University of Idaho, Biological Sciences, Computational Genomics Search Committee
Member (2001) University of Idaho, Computer Science, Department Chair Search Committee
Chair (2001) University of Idaho, Computer Science, Koza Fellowship Search Committee
Member (2000) University of Idaho, Computer Science, Faculty Search Committee
Chair (1998) University of Idaho, Computer Science, CS Alumni Committee

Chair (1998) University of Idaho, Computer Science, Ad hoc committee on faculty evaluations
Chair (1998) University of Idaho, Computer Science, Chair of Graduate Studies and Research
Member (1998) University of Idaho, Computer Science, Faculty Search Committee
Member (1998) University of Idaho, Computer Science, Strategic planning committee
Member (1995) University of Idaho, Computer Science, Faculty Search Committee
Coach (1990 to 1994) University of Idaho, Computer Science Department, Student Programming Team
Chair (1992) University of Idaho, Computer Science, Ad hoc committee on service courses
Member (1991) University of Idaho, Computer Science, Faculty Search Committee
Chair (1991) University of Idaho, Computer Science, Graduate Program Committee
Member (1990) University of Idaho, Computer Science, Graduate Program Committee

HONORS AND AWARDS

Lifetime Achievement Award for Contributions to Evolutionary Computing in Europe (Apr 2017)
Society for the Promotion of Evolutionary Computation in Europe and Surroundings
University Distinguished Professor (Feb 2016) University of Idaho
Distinguished Faculty Award (Apr 2015) University of Idaho, College of Science
Sabbatical year (Jun 2007) University of Idaho
Teaching Excellence Award (Jun 2002) University of Idaho
Plenary talk (Jul 2001) National Evolution Meetings
Sabbatical year (Jun 1999) University of Idaho
Alumni Award for Excellence (Jun 1998) University of Idaho Alumni Association
Association for Computing Machinery Outstanding Teacher of the Year (Jun 1995) Students of the ACM

OUTREACH

Mentor 7th grader for Invent Idaho (Mar 2015) Invent Idaho
Darwin Day road show (Feb 2015) NESCENT
Classics meets veterans (Nov 2011) UI

PUBLICITY

Foster Honored with Lifetime Achievement Award for Work with Genetic Programming (Jun 2017)
University of Idaho
James Foster Honored at EvoStar Conference in Amsterdam (Apr 2017) BEACON Buzz
Researchers Examine Evolution with National Science Foundation Support (Pending or In Press) UI Register
KXLY BEACON Renewal (Aug 2015) KXLY News
UI BEACON Renewal press release (Pending or In Press) (Aug 2015) University of Idaho
UI Faculty Bring in \$500,000 for Research of Evolution in Action (Pending or In Press) UI Register
Tending the Body's Microbial Garden (Jun 2012) New York Times
UI Friday Letter (Mar 2012) University of Idaho
UI Researchers receive funding for "evolution in action" projects (Feb 2012) University of Idaho

OTHER ACTIVITIES

Visit to INBRE partner schools (Nov 2015) Boise, ID

Visit to INBRE partner schools (Nov 2015) Caldwell, ID

Visit to INBRE partner schools (Nov 2015) Nampa, ID

OTHER

UNPUBLISHED WRITINGS

1. IY Zhbannikov, SS Hunter, JA Foster, M Settles (2017) SeqyClean: a pipeline for high-throughput sequence data preprocessing. ACM Conference on Bioinformatics and Computational Biology
2. (2015) SeqyClean: a pipeline for high-throughput sequence data preprocessing. Oxford Bioinformatics
3. B Baumgaertner, JA Foster (2015) Signaling games as a case study for the integration of the historical and philosophical analysis of science. History and Philosophy of Science, Conference, Edinburgh, UK
4. B Baumgaertner, P Fetros, JA Foster (2015) This is not the squid you are looking for. Artificial Life and Evolutionary Algorithms (ALEA), Part of EPIA conference
5. B Baumgaertner, P Fetros, JA Foster (2015) This is not the squid you are looking for. EVOBIO, Part of EvoStar conference
6. B Robison (2014) UI Concept paper for NSF National Research Training . University of Idaho, Internal competition
7. JA Foster (2013) Foxholes not Silos. Chronicle of Higher Education
8. IY Zhbannikov, SS Hunter, H Mendes-Soares, R Hickey, JA Foster, M Settles (2013) BALMNet: Biologically Associated Text Miner and Network builder. Proceedings ACM international conference on bioinformatics, computational biology, and biomedical informatics (acm bcb 2013), Washington, DC. 22-25 September 2013
9. IY Zhbannikov, JW Brown, JA Foster (2013) decisivatoR: an R package for phylogenetic decisiveness. Bioinformatics
10. IY Zhbannikov, JW Brown, JA Foster (2013) decisivatoR: an R infrastructure package that addresses the problem of phylogenetic decisiveness . ACM Conference on Bioinformatics and Computational Biology