

## **FOSTER, J A**

Phone: +1 208 885 7062

Email: foster@uidaho.edu (work), jamesafoster@mac.com (personal)

Mail: 875 Perimeter Drive MS 3051; Dept. of Biological Sciences; University of Idaho; Moscow, ID 83844

### **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, University of Idaho, Wichman Lab (1999 to 2001)

Sabbatical, Marine Biology Lab Microbial Diversity (2007 to 2007) Woods Hole, MA

### **PROFESSIONAL EXPERIENCE**

#### **ACADEMIC EXPERIENCE**

##### **POSITIONS AND EMPLOYMENT**

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

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

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

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

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, Idaho INBRE Bioinformatics Core (2000 to now)

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)

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 now) 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 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 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 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. 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*, In Press
2. 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
3. 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

4. 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
5. 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>
6. DL Beck, C Daniels, JA Foster (2014) Seed: A microbial community visualization tool. *Bioinformatics*, pii: btu693
7. 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
8. YS Baker, R Agrawal, JA Foster, DL Beck, G Dozier (2014) Detecting Bacterial Vaginosis Using Machine Learning. *ACM Southeast Conference*, Springer
9. JA Foster (2014) Microbial diversity, bar-coding approaches. *Encyclopedia of Metagenomics*, Springer
10. 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
11. DL Beck, JA Foster (2014) Machine learning techniques accurately classify microbial communities by bacterial vaginosis characteristics. *PLOS One*, 9(2):e87830
12. 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
13. 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
14. 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
15. 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
16. 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
17. 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
18. 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
19. 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
20. 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
21. 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
22. J Bunge, D Bohning, HK Allen, JA Foster (2012) Estimating population diversity with unreliable low frequency counts. *Pacific Symposium on Biocomputing*, 203-212
23. 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)
24. JA Foster, JH Moore (2011) Microbiome Studies: PSB 2011 special session introduction. *Proc, Pacific*

Symposium in Biocomputing

25. 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
26. 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
27. MD Day, DL Beck, JA Foster (2011) Microbial communities as experimental units. *Bioscience*, 61(5):398-406
28. 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
29. S Silva, JA Foster (2010) Introduction to the GPEM special issue on the best of EuroGP 2010. *Genetic Programming and Evolvable Machines*
30. 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
31. 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
32. 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
33. M Keitzer, JA Foster (2007) Crossover Bias in Genetic Programming. *Proceedings of the 10th European Conference on Genetic Programming, LNCS 4445:33-44*
34. 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
35. 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
36. 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
37. 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
38. 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
39. E Cantu-Paz, JA Foster (2005) Introduction to special issue on best papers from GECCO. *Genetic and Evolutionary Computation Conference*, Guest editor, special issue of best papers
40. W Banzhaf, JA Foster (2004) Introduction to GPEM Special issue on biological applications of genetic and evolutionary computation. *Genetic and Evolutionary Computation Conference*, Guest editor, special issue of biological applications
41. C Shyu, LJ Sheneman, JA Foster (2004) Evolutionary computation for multiple sequence alignment. *Genetic Programming and Evolvable Machines*. Kluwer, 5(2) pp 121-144
42. 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
43. 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
44. W Banzhaf, JA Foster (2004) Introduction to special issue on biological applications of genetic and evolutionary computation. *Genetic Programming and Evolvable Machines*. Kluwer, 5(2)

45. C Shyu, JA Foster (2004) Evolving consensus sequence for multiple sequence alignment with a genetic algorithm. Proc Genetic and Evolutionary Computing Conference (GECCO)
46. 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
47. 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
48. 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
49. R Shepherd, JA Foster (2003) Inherent fault tolerance in evolved sorting networks. Proc. Genetic and Evolutionary Computing Conference (GECCO). Springer-Verlag, p. 461, July
50. 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
51. 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
52. 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
53. 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
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, LJ Forney (2002) Electronic Polymerase Chain Reaction (EPCR) Search Algorithm. Proc. IEEE 1st Bioinformatics Conference. p, 338
56. 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
57. 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
58. 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
59. JA Foster (2001) Discipulus: the first commercial genetic programming system, invited publication in J. Genetic Programming and Evolvable Hardware. 2:2, pp, 201-203
60. 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
61. 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
62. JA Foster (2001) Evolutionary computation. Nature Genetics Reviews, 2:428-436
63. 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
64. 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
65. K Imamura, JA Foster (2001) Fault-tolerant hardware through n-version genetic programming. Proc. 5th World Multiconference on Systemics, Cybernetics and Informatics (SCI 2001)

66. 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
67. 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
68. 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
69. 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
70. B Rylander, T Soule, JA Foster (2000) Quantum evolutionary computation. Proc. Int. Conf. On Genetic and Evol. Comp. (GECCO). Morgan Kaufmann. p, 373
71. 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
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. 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
75. 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
76. 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
77. 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
78. 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
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. 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
81. B Harvey, D Frincke, JA Foster (1999) Toward byte code genetic programming. Proc. Int. Congress on Genetic and Evol. Comp. (CEC). p, 1234
82. JA Foster (1998) Evolutionary Computing. Encyclopedia of Distributed Computing
83. B Harvey, JA Foster, D Frincke (1998) Byte code Genetic Programming. Late Breaking Papers at GP98, J. Koza, ed., pp 59-63
84. 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
85. 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
86. 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
87. T Soule, JA Foster (1998) Limiting code growth in genetic programming. J Evolutionary Computation, 6:4, 293-310
88. 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

89. 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
90. 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
91. 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
92. 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
93. T Soule, JA Foster, J Dickinson (1996) Using genetic programming to approximate maximum cliques. Proc. Genetic Programming (GP), Koza, Goldberg, Fogel and Riolo eds, Morgan Kaufmann, pp, 400-405
94. T Soule, JA Foster, J Dickinson (1996) Code growth in genetic programming. Proc. Genetic Programming (GP), Koza, Goldberg, Fogel and Riolo eds, Morgan Kaufmann, pp, 215-223
95. 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
96. 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
97. JA Foster, PW Oman, K Van Houten, W Zhu (1995) Using self-delimiting strings to represent trees. Congressus Numerantium, 107:5-22, July
98. 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
99. JA Foster (1995) Exploring the polynomial hierarchy with generic sets. J Computing and Info., pages 166-183, July
100. 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
101. JA Foster (1993) The generic oracle hypothesis is false. Info. Proc. Letters, 45:59-62, 26 February
102. PW Oman, K Van Houten, JA Foster (1993) Representing arbitrary trees as self-delimiting binary strings. Congressus Numerantium, 96:47-56, December
103. 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
104. JA Foster (1979) The greatness which was Greece. Inquiry, 1(1)

### **PEER REVIEWED**

1. C Shyu, JA Foster (2004) Characterization of Microbial Diversity Based on T-RFLP Data with Nonparametric Statistics. Proc, American Society of Microbiologists (ASM)
2. 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
3. C Shyu, JA Foster (2004) Performance Comparison of Multiple Sequence Alignment Programs Using Nonparametric Statistics. Research in Computational Biology (RECOMB)
4. LJ Sheneman, JA Foster (2004) Evolving Better Alignments. Pacific Symposium on Biocomputing
5. C Shyu, JA Foster (2003) Inferring Microbial Community Structures with Dynamic Programming and Bayesian Statistics, Proc. American Society of Microbiologists (ASM), May 18-22
6. 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 1998 meeting of the Weed Sciences Society of America
7. JA Foster (1992) Structure in complexity theory. Bulletin of the European Association for Theoretical Computer Science. 46:239-47, February

8. JA Foster (1987) Differential geometry on fractal manifolds. *The Journal of Chaos and Graphics*, 2(30), August
9. JA Foster (1979) Real security. *Critical Inquiry*, 1(1)
10. JA Foster (1978) The formal incomprehensibility of the creation stories in genesis. *Illinois Libertarian*

### **BOOK CHAPTER**

### **BOOK**

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

### **PENDING**

1. W Banzhaf, B Baumgaertner, G Beslon, R Doursat, JA Foster, B McMullin, VV de Melo, T Miconi, L Spector, S Stepney, R White (Pending or In Press) An Evolutionary, Biosocial Perspective on Variation in Human Milk Microbes and Oligosaccharides: An Example of Eco-Homeorhesis?. *Lactation Biology*, book chapter, submitted

### **TECHNICAL REPORTS**

1. 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
2. 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
3. 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
4. JA Foster, PW Oman, K Van Houten, W Zhu (1995) Using self delimiting strings to represent trees. Using self delimiting strings to represent trees. Technical report CS 92-06, U. of Idaho, October
5. JA Foster, T Soule (1995) Using genetic algorithms to find maximum cliques. Technical Report LAL 95-12, University of Idaho, Moscow, ID 83844-1010, August
6. J Clough, RW Ireland, M Barnett, JA Foster (1995) Transposable element simulator: Technical documentation. Technical Report LAL 95-11, University of Idaho, Dept. of Computer Science, Moscow, ID 83844-1010, August
7. JA Foster (1995) The generic oracle hypothesis is false. Technical Report TR 92-04, University of Idaho, Department of Computer Science; Moscow, Id 83855, January
8. 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
9. 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
10. HS Snevily, JA Foster (1995) The 2-pebbling property and a conjecture of graham's. Technical Report LAL 95-03, University of Idaho, Moscow, ID 83844-1010, September
11. JA Foster (1991) A note on relativized counting classes. Technical Report TR 91-10, University of Idaho, October
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



13. JA Foster (1989) Models of space-bounded relativization. Technical Report CS-JAF-89-2, Illinois Institute of Technology
14. JA Foster (1989) My work at IIT. Technical Report CS-JAF-89-3, Illinois Institute of Technology
15. JA Foster (1989) Introduction to predicate logic. Technical Report CS-JAF-89-1, Illinois Institute of Technology
16. JA Foster (1988) Context sensitive grammars are closed under complementation. Technical Report TR92-0014, International Business Machines
17. JA Foster (1988) Computational complexity. Technical Report TR92-0013, International Business Machines
18. JA Foster (1987) Branch and bound versus backtracking. Technical Report TR92-0015, International Business Machines
19. JA Foster (1987) Searching and sorting with a 3-way compare. Technical Report TR92-0009, International Business Machines
20. JA Foster (1987) A prisoner's dilemma with a divide and conquer solution. Technical Report TR92-0010, International Business Machines
21. JA Foster (1987) Tagproc: A grammar driven tag rewriter. Technical Report TR92-0012, International Business Machines
22. JA Foster (1987) The data mapping program: An early entity relationship database. Technical Report TR92-0011, International Business Machines
23. JA Foster (1986) Trip report for pubtech '86. Technical Report TR92-0004, International Business Machines, March
24. JA Foster (1986) Conferencing with confdisk. Technical Report TR92-0005, International Business Machines

### **MANUSCRIPTS**

1. B Baumgaertner, JA Foster (Pending or In Press) 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
2. (2015) SeqyClean: a pipeline for high-throughput sequence data preprocessing. Oxford Bioinformatics Rejected
3. B Baumgaertner, P Fetros, JA Foster (2015) This is not the squid you are looking for. EVOBIO, Part of EvoStar conference Rejected
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 Rejected
5. B Robison (2014) UI Concept paper for NSF National Research Training . University of Idaho, Internal competition
6. JA Foster (2013) Foxholes not Silos. Chronicle of Higher Education Rejected
7. 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
8. IY Zhbannikov, JW Brown, JA Foster (2013) decisivatoR: an R package for phylogenetic decisiveness. Bioinformatics

### **DATA AND SOFTWARE**

1. (Pending or In Press) 16S amplicons of breast milk. SRA,
2. (Pending or In Press) 16S amplicons of human vagina. SRA,
3. (Pending or In Press) 16S amplicons of glacial forefield transects. SRA,
4. IY Zhbannikov, JA Foster (Jan 2015) MetaAmp: microbial community analysis with multiple fingerprint

- sequenceas. <https://github.com/ibest/MetAmp>,
5. IY Zhbannikov, M Settles, JA Foster (Mar 2014) SeqyClean as a novel approach in next generation sequencing cleaning,
  6. DL Beck, C Daniels, JA Foster (Jan 2014) Seed: A microbial community visualization tool. <https://github.com/danlbek/Seed>,
  7. IY Zhbannikov, M Settles, SS Hunter, JA Foster (Jun 2013) SlopMap: a software application tool for quick and flexible identification of similar sequences using exact k-mer matching,
  8. DL Beck, JA Foster (Jun 2011) OTUbase: an R infrastructure package for operational taxonomic unit data.,
  9. C Shyu, JA Foster (Jun 2006) MICA: Microbial Community Analysis.,
  10. LJ Sheneman, J Evans, JA Foster (Jun 2006) Clearcut: the reference implementation for the relaxed neighbor joining phylogenetic tree construction method.,

## FUNDING

### **ACTIVE FUNDING AS PI, CO-PI, OR PD**

JA Foster, Koza donation, 2001 to now. John Koza Donation \$174,000 total , \$174,000 direct

B Baumgaertner, G Dozier, JA Foster, Simulating signals and security, current. BEACON Budget Request \$97,706 total , \$97,706 direct (PI: B Baumgaertner)

MK McGuire, L Bode, JA Foster, C Meehan, S Moore, NSF INSPIRE \"What is Normal\": Milk, Microbiome, HMO, 2013 to 2017. NSF IAA 041485301 \$999,999 total

### **ACTIVE FUNDING AS PARTICIPANT OR ESSENTIAL PERSONNEL**

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 (PI: E Goodman)

LJ Forney, Center of research in the processes of evolution, 2008 to 2015. NIH COBRE P20RR016448 \$5,096,846 total , \$5,096,846 direct (PI: LJ Forney)

C Bohach, Idaho INBRE Bioinformatics Core, 2014 to 2015. NIH INBRE 2P20GM103408-14 \$143,773 total , \$143,773 direct (PI: C Bohach)

C Bohach, Infrastructure network for biomedical research in Idaho, 2014 to 2018. NIH INBRE P20GM1034-08 \$16,000,000 total , \$16,000,000 direct (PI: C Bohach)

### **PAST FUNDING AS PI, CO-PI, OR PD**

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

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

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

LJ Forney, JA Foster, COBRE Bioinformatics Core Facility, 2011 to 2011. NIH COBRE P20RR016448-09 \$123,953 total

LJ Forney, JA Foster, COBRE Bioinformatics Core Facility, 2010 to 2010. NIH COBRE P20RR016448-08 \$303,622 total

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

D Lind, JA Foster, D Keim, Tribal law database enhancement, 2003 to 2008. NSF ITR EIA 0326103 \$411,446 total

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

LJ Forney, JA Foster, COBRE Bioinformatics Core Facility, 2008 to 2008. NIH COBRE P20RR016448-06A2 \$239,790 total

M Laskowski, C Bohach, JA Foster, J Oxford, M Thomas, Biomedical Research Infrastructure Network in Idaho, 1 to 2004. NIH BRIN P20 RR16454-01 \$8,184,982 total

LJ Forney, JA Foster, COBRE Computational and Mathematical Analysis of Biomedical Data, 2004 to 2004. NIH COBRE P20RR016448-03 \$409,170 total

JA Foster, Conference support for GECCO, 2003 to 2003. NSF/EIA IIS 0314012 \$15,000 total

JA Foster, Book Donation, 2003 to 2003. Kluwer Publishers \$3,500 total

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

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

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

JA Foster, Viral evolution; computer science and molecular biology, 1999 to 2001. NIH NIGMS F33GM20122 \$91,568 total

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

***PAST FUNDING AS PARTICIPANT OR ESSENTIAL PERSONNEL***

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

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

LJ Forney, COBRE Computational and Mathematical Analysis of Biomedical Data, 2005 to 2005. NIH COBRE P20RR016448-04 \$417,125 total (PI: LJ Forney)

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

LJ Forney, Center of Biomedical Excellence, 2007 to 2012. NIH COBRE P20RR016448 \$10,597,183 total , \$10,597,183 direct (PI: LJ Forney)

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

E Goodman, K Holekamp, R Lenski, C Ofria, R Pennock, BEACON center for the study of evolution in action, 2010 to 2015. NSF STC DBI 0939454 \$22,786,770 total (PI: E Goodman)

LJ Forney, COBRE Computational and Mathematical Analysis of Biomedical Data, 2006 to 2006. NIH COBRE P20RR016448-05 \$404,963 total (PI: LJ Forney)

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

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

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

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

C Bohach, Infrasctructure network for biomedical research in Idaho, 2010 to 2014. NIH INBRE P20GM1034-08 \$12,452,935 total , \$12,452,935 direct (PI: C Bohach)

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

LJ Forney, Center of Biomedical Excellence, 2001 to 2007. NIH COBRE P20RR016448 \$11,000,000 total , \$11,000,000 direct (PI: LJ Forney)

C Bohach, Biomedical Research Infrastructure Network in Idaho, 2004 to 2009. NIH INBRE P20RR 103408 \$16,151,426 total , \$12,452,935 direct (PI: C Bohach)

LJ Forney, COBRE Bioinformatics Core Facility, 2008 to 2008. NIH COBRE P20RR016448-06A2 \$381,014 total (PI: LJ Forney)

***REJECTED (PARTIAL, DATES AND AMOUNTS APPROXIMATE)***

PE Gessler, JA Foster, IGEM Proposal: Informatics and Data Science for Complex Systems, Pending or In Press to 2015. Idaho SBOE IGEMS/HERC program \$2,000,000 total

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

D Stenkamp, NIH-BUILD Undergraduate Research, 2014 to 2014. NIH BUILD \$3,000,000 total , \$3,000,000 direct

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

P Hartzell, Revamp Undergrad curriculum, 2014 to 2014. NSF \$1,000,000 total , \$600,000 direct

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

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

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

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

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

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

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

JA Foster, Next generation sequencing bioinformatics, 2010 to 2011. NIH S10 \$404,600 total

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

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

JA Foster, Next generation sequencing bioinformatics, 2009 to 2010. NIH S10 \$498,425 total

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

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

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

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

JA Foster, Limitations of progressive multiple sequence alignment algorithms, 2005 to 2005. NSF DBI \$778,985 total

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

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

## **PENDING**

## **PRESENTATIONS**

This list is incomplete.

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

JA Foster (Jan 2016) Combining bacterial fingerprints: A new algorithm. Medical School, University of Hawaii, Honolulu, HI

JA Foster (Jan 2016) Combining bacterial fingerprints: A new algorithm. Pacific Pacific Pacific Symposium on Biocomputing, Kohala, HI

JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. College of Idaho, Caldwell, ID

JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. Northwest Nazarene University, Nampa, ID

JA Foster (Nov 2015) Combining bacterial fingerprints: A new algorithm. Boise State University, Boise,

ID

B Baumgaertner, JA Foster (Oct 2015) Imperfect Observations Produce Asymmetric Signaling Roles. Northwest Philosophy Conference, Coeur Coeur D\Alene, ID

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

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

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

JA Foster (Jul 2015) Combining bacterial fingerprints: A new algorithm. FASEB, Big Sky, MT

JA Foster (Jul 2015) Combining bacterial fingerprints: A new algorithm. National meeting of the American Chemical Society, Pocatillo, ID

JA Foster (Jun 2014) Research cores as businesses. NIH NISBRE, Washington DC

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

JA Foster (May 2014) Combining bacterial fingerprints: A new algorithm. UI CS Seminar, University of Idaho, Moscow ID

DL Beck, JA Foster (Oct 2013) Machine learning techniques accurately classify microbial communities by bacterial vaginosis characteristics. IBEST Research Symposium, UI, Moscow, ID

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

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

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

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

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, Pocatillo, ID

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

DL Beck, JA Foster (Oct 2012) Using machine learning techniques to classify microbial communities. First annual IBEST research Symposium, University of Idaho, Moscow ID

JA Foster, W Schroeder (Oct 2012) Extensive IBEST interactions transcend college and university boundaries. First annual IBEST research Symposium, University of Idaho, Moscow ID

IY Zhbannikov, M Settles, SS Hunter, JA Foster (Oct 2012) SegyClean as a novel approach in next generation sequencing cleaning. First annual IBEST research Symposium, University of Idaho, Moscow ID

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

HK Allen, J Bunge, JA Foster, BA Stanton (Jun 2012) Estimating richness from phage metagenomes. ASM General Meeting, San Francisco, CA

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

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

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

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

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

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

JA Foster (Nov 2010) IBEST has had national impact. NIH NISBRE, Bethesda MD

JA Foster (Oct 2010) 17 years of sustained high performance interdisciplinarity (IBEST). Enhancing Communications in Cross Disciplinary Research, Coeur D\Alene, ID

JA Foster (Sep 2010) The human milk microbiome: Healthy breasts, mothers and babies. Geisel School of Medicine, Dartmouth College, Hanover, NH

JA Foster (Aug 2010) The Milk Microbiome: healthy mothers, breasts and babies. Idaho INBRE annual meeting, Moscow, ID

DL Beck, JA Foster (Aug 2010) OTUbase: an R package for OTU data analysis. Idaho INBRE annual meeting, Moscow, ID

MD Day, JA Foster (Aug 2010) Artificial ecosystem selection. Idaho INBRE annual meeting, University of Idaho, Moscow ID

KM Hunt, MK McGuire, JA Foster (Aug 2010) The core milk microbiome. Idaho INBRE annual meeting, University of Idaho, Moscow ID

JA Foster (Mar 2010) IBEST Bioinformatics and Sequencing Cores. Post Genomics Technology for Biological Discovery, Santa Fe, NM

JA Foster, M Settles, R Lyon (Mar 2010) IBEST Bioinformatics and Sequencing Cores. Association for Biological Research Facilities, Sacramento, CA

JA Foster (Jun 2005) Evolving multiple sequence alignments. Washington State University, Pullman WA

JA Foster (Nov 2004) Evolving multiple sequence alignments with Evalyn. Idaho State University, Pocatello, ID

JA Foster (Jun 2004) Tutorial: Biological applications of genetic and evolutionary computation. Genetic and Evolutionary Computation Conference, Seattle

JA Foster (Jun 2004) Evolving multiple sequence alignments with Evalyn. U. Wyoming, Laramie, WY

JA Foster (Jun 2004) Evolving multiple sequence alignments with Evalyn. Limerick University, Ireland

JA Foster (Jun 2004) Tutorial: Biological applications of genetic and evolutionary computation. Parallel Problem Solving from Nature (PPSN 8), Birmingham, UK

J Evans, JA Foster (Jun 2003) Tabu Search: A fast heuristic search algorithm for large data sets. Biology 545 poster session, Moscow, ID

LJ Sheneman, JA Foster (Jun 2003) EVALYN: Evolving guide trees for progressive multiple sequence alignment. Biology 545 poster session, Moscow, ID

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

J Evans, JA Foster (Jun 2003) Searching phylogenetic tree space efficiently. COBRE meeting, Moscow, ID

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

LJ Sheneman, JA Foster (Jun 2003) Evolving better alignments. COBRE meeting, Moscow, ID

C Shyu, JA Foster (Jun 2003) Evolving consensus sequences for multiple sequence alignment with a genetic algorithm. Idaho BRIN meeting, Moscow, ID

JA Foster (Jun 2003) Evolutionary computation for multiple sequence alignment. U. Arkansas Little Rock. Little Rock, AR, Jan

JA Foster (Jun 2003) Life of an Eccentric: Truly interdisciplinary studies. Idaho Phi Beta Kappa society, Moscow, ID

JA Foster (Jun 2002) IBEST: forming an interdisciplinary bioinformatics research group. National EPSCoR meeting, Anchorage, AK

JA Foster (Jun 2001) Genetic programming: building programs without using programmers. Microsoft research, Seattle, WA

JA Foster (Jun 2000) Experimental evolution with x174 bacteriophage. Dagstuhl workshop on Bioinformatics, Germany

JA Foster (Jun 2000) Using evolution in computation. Evolution meetings, Bloomington, IN

JA Foster (Jun 1999) Experimental evolution with x174 bacteriophage. Dagstuhl workshop on Evolutionary Computation Theory, Germany

JA Foster (Jun 1998) Realism and anti-realism in mathematics. Inland Northwest Philosophy Conference on Realism and Anti-Realism, Moscow, ID

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

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

JA Foster (Jun 1996) Stochastic algorithms and approximations: Implications for genetic algorithms. Idaho Academy of Science, 38th Annual Meeting, Idaho

JA Foster (Jun 1996) Introduction to genetic algorithms and genetic programming. Idaho Academy of Science, 38th Annual Meeting, Idaho

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

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

T Soule, JA Foster (Jun 1996) Code growth in genetic programming. Idaho Academy of Science, 38th Annual Meeting, Idaho

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

JA Foster, M Barnett, C Cassavant, J Clough, RW Ireland, HA Wichman (Jun 1995) Computer aided simulation of transposable element evolution. EVOL 95,

JA Foster (Jun 1995) Exploring the polynomial hierarchy with generic sets. Int. Conf. On Computing and Information, Toronto, CA

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

JA Foster (Jun 1993) Inductive inferencing: Models and results. Griffith University, Brisbane, Australia

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



JA Foster (Jun 1991) Dense properties and generic witnesses. Illinois Institute of Technology, Chicago, IL

JA Foster (Jun 1990) Forcing and genericity on the polynomial hierarchy. Washington, Ontario, British Columbia, Alberta Theory Seminar (WOBKATS), Banff, BC

---

## ADVISING AND MENTORING

### UNDERGRADUATE RESEARCH

P Fetros, Undergraduate in University of Idaho Simulations of Signaling Games Electrical and Computer Engineering

C Britson, Undergraduate in University of Idaho Philosophy of Signaling Games Philosophy

M Raish, BA in Biological Sciences (Oct 2012) Develop winnogradsky column protocol

D Tabish, BA in Biological Sciences (Oct 2012) Develop commodity PCR

B Laurea, BA in English (Sep 2012) Developing the ginger beer plant as a model ecosystem

M Raish, BS in (Jul 2012) Develop winnogradsky column protocol

S Nikolova, BS in (Jun 2010) Bioethics project: embryological sentience and moral agency

M Maw, BS in Theater (Jun 2010) Bioethics project: embryological sentience and moral agency

J Wilson, BS in (Jun 2010) Bioethics project: human relationships and physician assisted suicide

A Robinson, BS in (Jun 2010) Bioethics project: embryological sentience and moral agency

J Wilson, BS in (Jun 2010) Bioethics project: human relationships and physician assisted suicide

J Brunsfeld, BS in Computer Science (Jun 2006) Transposable element evolution: the simulator

J Harrison, BS in Computer Science (Jun 2004) Cloner: utility for using Beowulf clusters

J Cavaleri, BS in Computer Science (Jun 2001) Evolutionary Hardware: Tree Encoding of Sorting Circuits, Computer Simulations

Z Saul, BS in Computer Science (Jun 2000) Genetic Programming Robustness

C Creighton, BS in Computer Science (Jun 2000) Bioinformatics: databases and simulations

GKM Goh, BS in Computer Science (Jun 2000) Evolutionary Drug Design

K Scott, BS in Computer Engineering (Jun 2000) Evolutionary Hardware: Direct Encoding of Sorting Circuits

C Hall, BS in Computer Science (Jun 1999) Artificial Societies

Z Libby, BS in Computer Science (Jun 1999) Artificial Societies

B Hakala, BS in Computer Science (Jun 1999) Artificial Societies

I Russell, BS in Computer Science (Jun 1999) Artificial Societies

A Haight, BS in Computer Science (Jun 1998) Computer Simulations, Computational Biology

J Marconi, BS in Computer Science (Jun 1998) Evolutionary Computation and Keller Graphs

L Wright, BS in Computer Science (Jun 1998) Evolutionary Hardware

R Saxe, BS in Computer Science (Jun 1997) Graphical User Interface Design

N Sutherland, BS in Computer Science (Jun 1997) Computational Biology

S Jones, BS in Computer Science (Jun 1996) Graphical User Interface Design

RW Ireland, BS in Computer Science (Jun 1996) Computer Simulations, Computational Biology

J Sampson, BS in Computer Science (Jun 1995) Computer Simulations, Computational Biology, User Interfaces

J Clough, BS in Computer Science (Jun 1995) Computer Simulations, Cryptography, Computational Biology

J Coleman, BS in Computer Science (Jun 1995) Neural Networks  
LJ Sheneman, BS in Computer Science (Jun 1995) Formal Methods, Computational Biology  
B Kramer, BS in Computer Science (Jun 1994) Adaptive Searching, Machine Learning, Genetic Algorithms  
H Mullian, BS in Computer Science (Jun 1993) Skip Binary Search Trees

## **GRADUATE STUDENTS**

IY Zhbannikov, PhD in Bioinformatics and Computational Biology (May 2015) Preprocessing Algorithms and Software for Genomic Studies with High-Throughput Sequencing Data  
DL Beck, PhD in Bioinformatics and Computational Biology (Apr 2014) Classifying disease risk from microbial community composition  
LJ Sheneman, PhD in Bioinformatics and Computational Biology (Jun 2008) Multiple sequence alignment algorithms  
C Shyu, PhD in Bioinformatics and Computational Biology (Jun 2006) Evolutionary Computation in Bioinformatics  
GKM Goh, MS in Computer Science (Jun 2006) Detecting Protein Flexibility  
B Ahrens, MS in Computer Science (Jun 2005) Superresolution algorithms  
M Harrison, MS in Computer Science (Jun 2004) Robustness of evolved systems  
K Imamura, PhD in Computer Science (Jun 2002) N-Version Genetic Programming: a Probabilistically Optimal Ensemble Approach  
MM Meysenburg, PhD in Computer Science (Jun 2002) How Random Number Generator Quality Affects Simple Genetic Algorithm Performance  
R Shepherd, MS in Computer Science (Jun 2002) Fault Tolerance in Evolved Sorting Networks: the Search for Inherent Robustness  
B Rylander, PhD in Computer Science (Jun 2001) Complexity of Evolutionary Computation  
J Masner, MS in Computer Science (Jun 2000) Evaluating the Cost of Evolved Hardware  
J Determan, MS in Computer Science (Jun 2000) Automatic Expert System Rule Generation On Nondestructive Waste Assay Data  
B Harvey, MS in Computer Science (Jun 1999) Byte Code Genetic Programming and Its Application to Data Mining  
M Pokorny, MS in Computer Science (Jun 1998) Evolutionary Computation and Neural Nets  
JS Shoaf, MS in Computer Science (Jun 1998) Evolutionary Computation in Stock Portfolio Selection  
T Soule, PhD in Computer Science (Jun 1998) Code Bloat and Genetic Programming  
MM Meysenburg, MS in Computer Science (Jun 1997) Pseudorandomness and Evolutionary Computation  
Z Ouyang, MS in Computer Science (Jun 1989) Network Layer Routing Algorithm Feedback Routing Northeastern Illinois University  
TF Kuo, MS in Computer Science (Jun 1989) Static and Dynamic Huffman Coding

## **GRADUATE STUDENT COMMITTEES**

This list is not up to date

D Evans, PhD in Computer Science (Jun 2009)  
SJ Bent, PhD in Bioinformatics and Computational Biology (Jun 2007)  
MD Day, PhD in ISU Biology (Jun 2007)  
S Konduri, PhD in EE (Jun 2004)  
M Settles, PhD in Computer Science (Jun 2004)

S Smith, PhD in EE (Jun 2004)  
M Manic, PhD in EE (Jun 2004)  
K Dietrich, MS in MMBB (Jun 2000)  
YH Yi, MS in Electrical Engineering (Jun 1999)  
Huang, PhD in Chemistry (Jun 1999)  
J Streif, PhD in Chemistry (Jun 1998)  
FS Lam, MS in Computer Science (Jun 1998)  
WF Danielson III, MS in Computer Science (Jun 1998)  
J Kruchkow, MS in Computer Science (Jun 1997)  
J Theobald, MS in Biology (Jun 1997)  
S Stockett, PhD in Math (Jun 1997)  
J Kruchkow, MS in Anthropology (Jun 1997)  
T Meerdink, PhD in Math (Jun 1997)  
S Barbosa, MS in Computer Science (Jun 1996)  
Munna, MS in Computer Science (Jun 1996)  
S Stockett, MS in Math (Jun 1996)  
N Kattrup, MS in Computer Science (Jun 1995)  
W Zhu, MS in Computer Science (Jun 1995)  
R McCall, MS in Computer Science (Jun 1993)  
M Cohen, MS in Computer Science (Jun 1993)

## **POSTDOCTORAL SCHOLAR MENTORING**

S Harding, Postdoc in (Jun 2011) Evolvable Hardware in Liquid Crystal Displays  
MD Day, Postdoc in (Jun 2011) Artificial Ecosystem Selection

---

## **TEACHING**

Class sizes are often approximate.

## **UNIVERSITY OF IDAHO**

Analysis of Algorithms, CS 495/M 405: 1992 (45 appr.); 1993 (45 appr.); 1994 (45 appr.); 1995 (45 appr.); 1996 (45 appr.); 1997 (45 appr.); 1998 (22)  
BCB Seminar: Bioinformatics and Computational Biology, BCB 501 : 2009 (12 app.); 2010 (12 app.)  
Bioethics, Biol 118: 2005 (30 appr.); 2006 (30 appr.); 2007 (30 appr.)  
Bioethics II, Core 168: 2006 (24 appr.); 2007 (24 appr.); 2008 (24 appr.)  
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)  
PhD Research, CS 600 : 1995 to 2006  
PhD Research, BCB 600 : 2011 to now  
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 appr.)  
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**

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

---

## **SERVICE, OUTREACH, PUBLICITY, HONORS**

Items are not exhaustive and dates may be approximate.

### **PROFESSIONAL SERVICE**

Associate Editor, IEEE Transactions on Evolutionary Computation (2015 to now)  
European Conference on Genetic Programming (EuroGP), executive committee: 1996 to now  
European Conference on Genetic Programming (EuroGP), executive committee: 1996 to now

European Evolutionary Computation Meetings (EvoStar), Executive committee (Jun 2009 to now): 2009 to now

Genetic Genetic Programming and Evolvable Machines, Life Sciences thematic editor, Genetic Genetic Programming and Evolvable Machines (2012 to now) Life Sciences thematic editor

Genetic Programming and Evolvable Machines, associate editor, Genetic Programming and Evolvable Machines (2003 to now) associate editor

IEEE Transactions on Evolutionary Comp, Referee: 2000 to now

International Conference on Genetic and Evolutionary Computation (GECCO), Program committee: 1995 to now

Journal of Evolutionary Computation, referee: Pending or In Press

Journal of Genetic Programming and Evolvable Hardware (GPEM), Referee: 2005 to now

Journal of Science and Engineering Ethics, referee: 2015 to now

New Hampshire INBRE External Advisory Committee: 2012 to now

University of Wyoming INBRE Bioinformatics Core, external advisor: 2014 to now

Idaho INBRE Bioinformatics Core tour: 2015 to 2016

Ibero-American Conference on Artificial Intelligence: 2015 to 2016

Journal of Evolutionary Computation, associate editor, Journal of Evolutionary Computation (2003 to 2016) associate editor

NIH NCI Up for Challenge: 2016

Computational Approaches to Study Microbes and Microbiomes: 2016

PSB Workshop on Computational approaches to study microbes and microbiomes: 2016

Idaho State Board of Education, General education core, natural sciences representative: 2013 to 2015

Bioinformatics host: 2015

BEACON support for International Herpesvirus Workshop: Pending or In Press to 2015

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

National IDEA Core Lab Steering Committee (NICL): 2004 to 2014

Microbiome (journal), Referee: 2013 to 2014

BEACON External Advisory Board and site visit, online: 2013

European Conference on Genetic Programming (EuroGP), session chair: 2001 to 2013

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

NSF IUCRC CISE FRP & CORBI funding panel, panelist: 2013

Genetic and Evolutionary Computation Conference (GECCO), GP track program committee: 2003; 2007

French National Research Academy, reviewer: 2013

Idaho COBRE, research advisory board: 2007 to 2012

Natural Sciences and Engineering Research Council of Canada, reviewer: 2002 to 2012

Science Foundation Ireland, reviewer: 2004; 2012

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

European Conference on Genetic Programming (EuroGP), program co-Chair (with Sara Silva): 2011

Briefings in Bioinformatics, referee: 2008 to 2010

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

NIH Biomedical Data Management and Analysis, permanent member, permanent member: 2004 to 2008

American Naturalist, referee: 2006 to 2007  
NSF OSX III, panelist: 2006  
University of Alaska INBRE, bioinformatics external advisory board: 2006  
University of Nevada Reno INBRE, external advisory board: 2006  
Genetic Programming and Evolvable Machines, Guest editor, special issue on best of GECCO, Genetic Programming and Evolvable Machines (2005 to 2005) Guest editor, special issue on best of GECCO  
Workshop on Foundations of Genetic Algorithms (FOGA), referee: 1995 to 2005  
Genetic and Evolutionary Computation Conference (GECCO), Chair miniconference on Biological Applications: 2002; 2003; 2004; 2005; 2014  
Genetic Programming and Evolvable Machines, Guest editor, special issue of on evolutionary computation in bioinformatics, Genetic Programming and Evolvable Machines (2004 to 2004) Guest editor, special issue of on evolutionary computation in bioinformatics  
International Conference on Genetic Programming (ICGP), program committee: 1992 to 2004  
International Society on Genetic and Evolutionary Computing (ISGEC), chair, council on conferences: 2003  
U.K. Engineering and Physical Sciences Research Council, reviewer: 2003  
Idaho BRIN Bioinformatics workshops, chair: 2002; 2003  
European Conference on Genetic Programming (EuroGP), Program co-Chair (with Evalyn Lutton): 2002  
GECCO Graduate Student Workshop, panelist and chair: 1999 to 2002  
NSF Biological Databases and Informatics (BDI), panelist: 2002  
NSF Information Technology Research (ITR), panelist: 2002  
University of Idaho, INBRE internal advisory board: 2002  
NSF Integrated Graduate Research, Education, Training (IGERT), panelist: 2001  
NSF Research Infrastructure (RI), panelist: 2001  
NASA/JPL Evolvable Hardware conference (EH), referee: 1996 to 2000  
NASA/JPL Evolvable Hardware Workshop, session chair: 1999 to 2000  
Inland Northwest Philosophy Conference, responder, session chair: 1998  
International Congress on Evolutionary Computation, session chair: 1998  
International Congress of Evolutionary Computation (CEC), Program committee: 1995; 1996  
International Conference on Genetic Algorithms (ICGA), program committee: 1993 to 1995  
Information Processing Letters, referee: 1990 to 1995  
International Conference on Computing and Information (ICCI), program committee: 1992 to 1995  
Journal of Discrete Mathematics, referee: 1990 to 1995  
International Conference on Computing and Information (ICCI), session chair: 1994  
Journal of Artificial Intelligence Research, referee: 1990 to 1991  
Journal of Parallel and Distributed Computing, referee: 1990 to 1991

## **UNIVERSITY SERVICE**

Bioinformatics and Computational Biology (BCB) graduate program, governing board: 2006 to 2009  
Bioinformatics and Computational Biology degree program, director: 2003 to 2006  
IBEST Bioinformatics core, director: 2001 to 2012  
Northwest Knowledge Network Advisory Board: 2016 to now  
Faculty Senate: 2014 to 2017

Task force on computing infrastructure: 2015 to now  
Graduate and Professional Student (GPSA) award committee: 2013  
University Commencement Committee: 1991 to 1993  
Graduate Council: 2001  
University Wide Programs interdisciplinary council: 2003 to 2006  
First annual CyberInfrastructure day: 2012  
Faculty Affairs Committee: 1994 to 1997  
Critical Thinking Advisory Council: 2000

## **COLLEGE SERVICE**

Bioinformatics Journal Club, Faculty Advisor: 2003  
College of Science Faculty Council (Pending or In Press) : 2014 to now  
CS Chair evaluation committee, Chair: 2006  
Tenure and Promotions Committee, : 1997; 2002; 2006  
Committee on Student Professional Fees, : 1998  
Faculty Morale Committee, Chair: 1997  
Tenure and Promotions Committee, : 2013; 2014; 2015  
Core director search committee, : 2007  
Association for Computing Machinery (ACM), student chapter, : 1990; 1995  
Curriculum Committee, : 1988  
Library Committee, : 1988  
: 2015  
CS chair search committee, : 2002

## **DEPARTMENTAL SERVICE**

Ad hoc committee on faculty evaluations, Computer Science: 1998  
Ad hoc committee on service courses, Computer Science, chair: 1992  
Bioinformatics and Computational Biology (BCB), faculty member: 2006  
Tenure and promotion committee for Dave Tank: 2013  
Tenure and promotion committee for Scott Nuismer: 2012  
Third year review committee for Onesmo Ballemba: 2010  
Tenure and promotion committee for Chris Marx: 2015  
Chair of Graduate Studies and Research, Computer Science: 1998  
Computational Genomics Search Committee, Biological Sciences, Chair: 2001  
CS Alumni Committee, Computer Science, Chair: 1998  
Department Chair Search Committee, Computer Science: 2001  
Faculty Search Committee, Computer Science: 2000  
Faculty Search Committee, Computer Science: 1995  
Faculty Search Committee, Computer Science: 1998  
Faculty Search Committee, Computer Science: 1991  
Graduate Program Committee, Computer Science: 1990  
Graduate Program Committee, Computer Science, Chair: 1991

Koza Fellowship Search Committee, chair: 2001

Search committee for IBEST system administrator, Initiative for Bioinformatics and Evolutionary Studies (IBEST), chair: 2002

Seminar committee, Biological Sciences: 2011

Space Committee, Computer Science: 2002

Strategic planning committee, Biological Sciences: 2011

Strategic planning committee, Computer Science: 1998

Student Programming Team, coach: 1990

## HONORS AND AWARDS

International Society for Computational Biology Senior Member.

National Eta Sigma Phi, National Honorary Classical Fraternity.

University (Mar 2016) University of Idaho Research Excellence. Nomination

University of Idaho (Feb 2016) University of Idaho Distinguished Professor. Details

University of Idaho, College of Science (May 2015) College of Science Distinguished Faculty Award.

University of Idaho (Apr 2015) Faculty Excellence in Interdisciplinary Activities (Pending or In Press) .  
Faculty Excellence Award Nomination

University (Jun 2007) Sabbatical year.

International (Jun 2005) Who's Who in the World.

International (Jun 2005) Who's Who in Science and Engineering.

National (Jun 2005) Marquis Who's Who in America.

International (Jun 2002) International Biographical Centre International Scientist of the Year.

University (Jun 2002) University of Idaho Teaching Excellence.

International (Jul 2001) Stonehouse Workshop in Computational Complexity.

National (Jul 2001) Plenary talk at National Evolution meetings.

International (Dec 2000) Dagstuhl International Seminar on Evolutionary Computation theory.

International (Jun 2000) International Biographical Centre 2000 Outstanding Intellectuals of the 20th Century.

International (Jun 2000) 2000 Outstanding Scientists of the 21st Century.

National (May 2000) Humanity and Technology Workshop.

International (Dec 1999) Dagstuhl International Seminar on Bioinformatics.

National (Jun 1999) Lexington Who's Who of American Teachers.

National (Jun 1999) NIH/NIGMS Senior F33 Fellowship .

University (Jun 1999) Sabbatical year.

University (Jun 1999) University of Idaho Teaching Excellence award. Nomination

National (Jun 1998) Lexington Who's Who of American Teachers.

University (Jun 1998) University of Idaho Teaching Excellence. Nomination

University (Jun 1998) Alumni Award for Excellence.

University (Jun 1997) University of Idaho Teaching Excellence. Nomination

International (Sep 1996) Foundations of Genetic Algorithms.

Department (Jun 1995) Association for Computing Machinery Outstanding Teacher of the Year.

## OUTREACH



# OTHER ACTIVITIES