Dr. Charles Ofria

Computer Science and Engineering
2140 Engineering Building, Michigan State University
East Lansing, MI 48824
ofria@msu.edu - http://www.cse.msu.edu/~ofria/

EDUCATION

California Institute of Technology   1994-1999
Ph.D. Computation and Neural Systems   May 1999
Advisor: Dr. Christoph C. Adami
Thesis: "Evolution of Genetic Codes"

State University of New York at Stony Brook   1991-1994
B.S. Computer Science, Pure Math, and Applied Math   May 1994

RESEARCH EXPERIENCE

Professor   July 2013-Present
Associate Professor   July 2008-June 2013
Assistant Professor   July 2002-June 2008
Computer Science and Engineering
Ecology, Evolutionary Biology, and Behavior
Michigan State University, East Lansing MI

Research Assistant Professor   Oct. 1999-June 2002
Research Associate   Aug. 1999-Sept 1999
Advisor: Dr. Richard E. Lenski
Center for Microbial Ecology and Center for Biological Modeling
Michigan State University, East Lansing MI

Postdoctoral Research Associate   June 1999-July 1999
Graduate Research Assistant   Aug. 1994-May 1999
Advisor: Dr. Christoph C. Adami
Computation and Neural Systems
California Institute of Technology, Pasadena CA

TEACHING EXPERIENCE

***Courses at Michigan State University*:**
Instructor: CSE 450 - Translation of Programming Languages   Spring 2004, 2005, 2006, 2007
                                                                   Fall 2013, 2014, 2015
Instructor: CSE 491 - Digital Evolution and Biocomplexity   Spring 2005
Instructor: CSE 830 - Design and Theory of Algorithms   Spring 2000,2003,2008,2015
                                                                   Fall 2002,2005,2009,2011
Co-Instructor: CSE 845 – Multidisciplinary Methods for the Study of Evolution   Spring 2014
Instructor: CSE 891 - Digital Evolution and Biocomplexity   Fall 2003, Spring 2007, 2009
Co-Instructor: CSE 891 – Multidisciplinary Methods for the Study of Evolution   Spring 2011, 2012
Co-Instructor: BCH 960 - Topics in Biological Modeling   Spring 2001
Co-Instructor: QB 827 – Problems in Quantitative Biology   Fall 2009
Instructor: ZOL 890 - Special Topics in Digital Evolution: The Avida Platform   Spring 2002

Guest Lecturer for courses at MSU:

ZOL 890: Evolutionary Biology for non-Biologists	Fall 2010, 2011
CSE 848: Evolutionary Computation	Spring 2003, 2005, 2007, Fall 2008, 2010
MTH 370: Mathematical Biology	Spring 2007
MMG 433: Microbial Genomics	Spring 2003
CSE Graduate Seminary Series	Fall 2003, 2004, 2006

AWARDS AND HONORS

Withrow Teaching Award	Mar. 2010
18th place in nation - 2009 Google U.S. Puzzle Championship	June 2009
16th place in nation - 2008 Google U.S. Puzzle Championship	June 2008
NSF CAREER Award	April 2007
Front page headline story on research, Lansing State Journal (Sunday, Nov 26)	Nov 2006
Withrow Distinguished Scholar Award	Mar. 2006
MSU Teacher/Scholar Award	Feb. 2006
Finalist, Microsoft New Faculty Fellowship	May 2005
Cover Story, February 2005 Discover Magazine	Feb. 2005
Interview on WKAR Morning Edition on NPR	Feb. 2005
Best Paper Award, Artificial Life IV Conference	July 2004
Runner-Up, Clauser Award for best Ph.D. thesis, California Institute of Technology	May 1999
National Science Foundation Fellowship	Sept. 1994-Aug 1998
Gift of Computer Equipment from Microsoft Corporation	Aug. 1997
First Horatio G. Burchard Award for Creativity and Quick Thinking	May 1994
(From the Computer Science and Applied Math departments at SUNY Stony Brook)	

GRANTS

Active LENs: Learning Evolution and the Nature of Science using Evolution in Action from the National Science Foundation. With R. Pennock, L. Mead, J. Smith, and R. Lenski. **$1,844,969**	Dec 2014-August 2019
BEACON: An NSF Center for the Study of Evolution in Action from the National Science Foundation. With E. Goodman, R. Lenski, R. Pennock and K. Holekamp. **$47,500,000**	August 2010-July 2020
Predictive Biology: Adaptability Robustness and the Fundamental Laws of Biology from DARPA. With R. Lenski. **$730,000**	Sept 2009-Sept 2010
ORCHID: Harnessing Digital Evolution to Design High-Assurance Adaptive Systems from the National Science Foundation. With B. Cheng, P. McKinley, and X. Tan. **$600,000**	June 2008-June 2012
CRI:IAD – A Testbed for Evolving Adaptive and Cooperative Behavior Among Autonomous Systems from the National Science Foundation. With P. McKinley, X. Tan, R Pennock, and B. Cheng. **$188,110**	May 2008-April 2009
SGER *– Applying Digital Evolution to Behavioral Models* from the National Science Foundation. With B. Cheng, P. McKinley, and R. Lenski. **$100,000**	Sept 2007-Sept 2008
CAREER: Digital Evolution and Biocomplexity – From Biological Theory to Computational Applications. from the National Science Foundation. **$400,000**	April 2007-March 2013

Planning grant: Center for Software-Intensive Ultra-Large-Scale Systems Jan 2007-Dec 2007
from the National Science Foundation. With B. Cheng, S. Biswas, P. McKinley,
and L. Dillon. **$10,000**

FunBio: Mathematical and Biological Studies of Fitness Landscapes from Jan 2006-Dec 2009
DARPA. With R. Lenski and P. Bates. **$2,700,000**

Emerging Intelligence: Contingency, Convergence and Constraints in the Jan 2006-Dec 2008
Evolution of Intelligent Behavior from the John Templeton Foundation. With
R. Pennock and R. Lenski. **£168,00**0 (approx. **$300,000**)

EMT: Reimagining Evolutionary Computation, from the National Science July 2005-July 2009
Foundation CCF-0523449. With R. Lenski. **$300,000**

Avida-ED: Technology for Teaching Evolution and the Nature of Science Feb 2004-Feb 2008
using Digital Organisms, from the National Science Foundation DUE-0341484.
With R. Pennock, D. Ebert-May, and R. Lenski. **$255,836**

ITR: Evaluating Phylogeny Reconstruction Algorithms with Digital Organisms. Sept 2002-Aug 2007
from the National Science Foundation EIA-0219229. With E. Torng and
T. Schmidt. **$324,722**

PROFESSIONAL ACTIVITIES

Reviewer for professional journals:
*Artificial Life; Communications of the ACM; IEEE Proceedings of Artificial Intelligence; Journal of
Theoretical Biology; Nature; Physica D; PLoS (Public Library of Science) journals: PLoS Biology, PLoS
Computational Biology, and PLoS ONE; Proceedings of the National Academy of Sciences; Proceedings
of the Royal Socity of London; South African Journal of Science; The American Naturalist;*

Program committee for journal special issues: Artificial Life: Evolution of Complexity (2007),
Artificial Life: Research with Avida (2004).

Program committees for professional conferences*:*
European Conference on Artificial Life (ECAL)	2005, 2009, 2011, 2015
Genetic and Evolutionary Computation Conference (GECCO)	2003-**Present**
International Conference on Artificial Life (ALIFE).	1998-**Present**

At Michigan State University:
Search Committee – Teaching Specialist in Computer Science	Aug 2015- **Present**
Awards Committee – Department of Computer Science	Aug 2015- **Present**
Retreat Planning Committee – Ecology, Evolutionary Biology & Behavior Program	Aug 2015- **Present**
Search Committee – John P. Koza Chair in Genetic Programming	Oct 2014-July 2015
Computational Mathematics, Science, & Engineering (CMSE) Steering Committee	Sept 2014-**Present**
Early Career Awards Committee	Sept 2014
Theme Leader: Computational Evolution, BEACON Center	July 2014-**Present**
Search Committee – BEACON Information Technologist	Feb 2014
Search Committee – BEACON Distinguished Postdoctoral Fellowship (Annual)	Dec 2013-**Present**
Biomedical Engineering Graduate Studies Committee	Aug 2013-May 2014
Promotion & Tenure Committee – Computer Science & Engineering	July 2013-**Present**
Advisory Board – CAFFE Program	October 2011
Search Committee – Diversity Director, BEACON Center	Sept 2010-Feb 2011
Executive Committee, BEACON Center for the Study of Evolution in Action	Sept 2010-**Present**
Deputy Director, BEACON Center for the Study of Evolution in Action	Aug 2010-**Present**
Search Committee – Koenig Endowed Chair of Electrical Engineering	July 2010-Mar 2011

Research Experience for Teachers Mentor June 2010-Sept 2011
Search Committee – Director of the Institute for Cyber-Enabled Research (ICER) June 2010-May 2012
Representative of MSU, Congressional NSF Day April 2010
Quatitative Biology Initiative Advisory Committee Aug 2009-May 2012
Chair, Steering Committee – Institute for Cyber-Enabled Research (ICER) May 2009-**Present**
University-wide Cyber-Enabled Discovery Visioning Committee Mar 2008-Oct 2008
Ad Hoc Committee for the redesign of the Computer Science web site June 2007-June 2008
Ad Hoc Committee for the redesign of the College of Engineering web site May 2007-June 2008
Ad Hoc Committee for Engineering and Health Initiative Feb 2007-Jan. 2008
Mentor, Graduate Fellowship Proposal Preparation Group Aug 2006-Nov 2011
Department of Computer Science Advisory Committee June 2006-May 2012
Department of Computer Science Curriculum Committee Aug 2005-May 2006
Quantitative Biology Fellowship Committee May 2005-May 2010
Department of Computer Science Faculty Search Committee Oct 2004-May 2006; Oct 2007-May 2008
Co-Chair, Quantitative Biology and Modeling Seminar Series Sept 2004-May 2008
Advisory Board – Quantitative Biology and Modeling May 2003-Nov 2007
Faculty Advisor – ACM Club, MSU Chapter Aug. 2003-May 2011
Computer Science Graduate Studies and Research Committee Aug 2002-May 2005
and Nov. 2009-**Present**
Faculty Advisor – MSU Medical Yoga Club Aug 2001-Aug 2011
Search Committee - Computational Biochemisty/Biophysics Nov 2002-May 2003
Co-Chair, Biological Modeling Seminar Series Sept. 2000-May 2001
Founding member, Center for Biological Modeling July 2000

Other activities:
Academic Editor, Journal of Artificial Life July 2015-**Present**
Academic Editor, PeerJ Jan 2015-**Present**
External Reviewer, Hampshire College School of Cognitive Science self evaluation Mar 2014
Chair, Thirteenth International Conference on Artificial Life (held July 2012) Oct 2010-Jan 2013
Panelist, National Science Foundation CAREER Awards Oct 2009
Invited Participant, DARPA workshops on the Fundamental Laws of Biology Mar 2007, Aug 2008
Invited Participant, NSF workshop on Emerging Models and Technologies July 2008
Proposal Reviewer for the National Science Foundation Feb 2007
Invited Participant, Formation of NSF Program on Advancing Theory in Biology Sept. 2006
Invited Participant, DARPA workshop on Microbial Cooperation Aug 2006
Invited Participant, Seaver Workshops on Evolution of Computer Viruses Sept 2005, July 2006
Invited Participant, DARPA workshop on Fitness Landscapes Feb 2006
Invited Participant, Microsoft Faculty Summit July 2005
Invited Participant, Santa Fe Workshop on the Road to Software Evolvability June 2005
Invited Participant, Santa Fe Workshop on Evolution of Robustness April 2002
Algorithm Consultant, Personal Spider Inc., Pasadena CA Aug. 2000-May 2001
Security Consultant, SmartTrac Computer Systems, East Setauket NY May 1994-July 1994
Algorithm Consultant, Tadmus Worldwide, Bohemia NY Mar. 1994-May 1994

CURRENT GRADUATE STUDENTS

Alex Lalejini   Spring 2020 (expected)
Dual-PhD student in Computer Science and EEBB
Topic: To be decided.

Emily Dolson   Spring 2018 (expected)
Dual-PhD student in Computer Science and EEBB
Topic: Interaction of Evolutionary and Ecological Dynamics

Anselmo Pontes   Spring 2018 (expected)
Dual-PhD student in Computer Science and EEBB
Topic: The Evolution of Gene Regulatory Networks

Anya Johnson   Spring 2017 (expected)
Dual-PhD student in Computer Science and EEBB
Topic: The Evolution of Cooperation

Rosangela Canino-Koning
Dual-PhD student in Computer Science and Ecology, Evo. Biology & Behavior   Spring 2016 (expected)
Topic: The Interplay of Evolvability and Modularity

FORMER GRADUATE STUDENTS

Anuraag Pakanati
PhD student in Computer Science   April 2015
Topic: The Evolutionary Acquisition of Information
Current: Software Engineer, Xoran Technologies

Luis Zaman
Dual-PhD student in Computer Science and EEBB   June 2014
Topic: The Evolution of Parasitic and Mutualistic Behaviors
Current: NSF Postdoc, University of Washington

Bess Walker
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior   December 2012
Topic: The Effects of Ecosystems on the Evolution of Complexity
Current: Software Engineer, Aptify

David Bryson
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior   August 2012
Topic: The Importance of Contingency in the Evolution of Complex Functions
Current: Software Engineer, Apple Inc.

Matthew Rupp
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior   April 2011
Topic: On the Evolution of Mutation Bias in Digital Organisms
  (co-advised with Prof. Eric Torng)
Current: Postdoc, Michigan State University

Heather Goldsby   February 2011
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior
Topic: The Evolution of Division of Labor
Current: Postdoc, University of Washington

Jeff Clune
PhD in Computer Science   April 2010
Topic: The Evolutionary Benefits of Generative Encodings
  (co-advised with Prof. Robert Pennock)
Current: Assistant Professor, University of Wyoming

Sherri Goings
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior   April 2010
Topic: Natural Niching: Applying Ecological Principles to Evolutionary Computation
Current: Assistant Professor, Carleton College

Arthur Covert
Dual-PhD in Computer Science and Ecology, Evolutionary Biology & Behavior   December 2009
Topic: The Effects of Detrimental Mutations on Evolution
Current: Postdoc, UT Austin

Laura Grabowski
PhD in Computer Science   May 2009
Topic: The Early Evolution of Intelligence in Navigation
Current: Assistant Professor, UT Pan American

Gabriel Yedid
Dual-PhD in Zoology and Ecology, Evolutionary Biology & Behavior   April 2007
Topic: Evolution in Digital Ecologies
  (co-advised with Prof. Richard Lenski)
Current: Assistant Professor, Nanjing Agricultural University, China

Dusan Misevic
Dual-PhD in Zoology and Ecology, Evolutionary Biology & Behavior   April 2006
Topic: The Evolution of Sex
  (co-advised with Prof. Richard Lenski)
Current: Postdoc, Institute National de la santé et de la recherche medical, Paris

Wei Huang
PhD in Computer Science   December 2005
Topic: Measuring Biological Complexity
Current: Business Analyst, Ipsen

Dehua Hang
PhD in Computer Science   December 2005
Topic: Comparison of Phylogenetic Tree Reconstruction Algorithms
  (co-advised with Prof. Eric Torng)
Current: AVP, Catastrophe Modeling at Allied World Reinsurance

Elizabeth Ostrowski
Dual PhD in Zoology and Ecology, Evolutionary Biology & Behavior   May 2005
Topic: Long term evolution with digital organisms
  (co-advised with Prof. Richard Lenski)
Current: Assistant Professor, University of Houston

Michelle Vogel
MS in Computer Science   May 2013
Topic: Deep-branch phylogeny reconstruction
Current: Software Engineer at Microsoft

Jason Stredwick
MS in Computer Science   December 2005
Topic: Evolution of Wire-Frame Organisms
Current: Software Engineer at uTest (spun off from Google)

Jinghua Zhang
MS in Computer Science   August 2001
Topic: Morphological Evolution in a 2D world
Current: Associate Professor, Winston-Salem State University

James Vanderhyde
MS in Computer Science   May 2001
Topic: Reconstructing phylogenetic trees
  (co-advised with Prof. Eric Torng)
Current: Assistant Professor, Benedictine College

POSTDOCTORAL RESEARCHERS

Joshua Nahum   Oct 2013-Present
BEACON Distinguished Postdoctoral Fellow

Aaron Wagner
BEACON Center for the Study of Evolution in Action   August 2010-March 2014
Current: Senior research scientist, Metron Corporation

Jeffrey Barrick
Microbiology and Molecular Genetics   September 2006-December 2010
(co-sponsored with Richard Lenski)
Current: Assistant Professor, UT Austin

Christopher Strelioff   August 2007-August 2010
Microbiology and Molecular Genetics
(co-sponsored with Richard Lenski)
Current: Postdoc, UC Davis

Wesley Elsberry
Lyman Briggs School   January 2007-August 2009
(co-sponsored with Robert Pennock)
Current: Scientific Programmer at the Fish and Wildlife Research Institute

UNDERGRADUATE RESEARCHERS

34 undergraduate students have performed research as part of my research group: Mikaela Lias (Summer 2015-present), Riley Annis (Fall 2014-present), Erin O'Hara (Summer 2014-Spring2015), Rodny Perez (Summer 2014), Demetrius Moncrease (Fall 2013-Spring 2014), Grayson Wright (Fall 2011-Spring 2012), Jacob Walker (Summer 2011-Spring 2012), David Rogers (Spring 2011-present), James Bosko (Spring 2011-Spring 2012), Tasneem Pierce (Fall 2010-Summer 2011), Mairin Chesney (Fall 2010-present), Michelle Vogel (Summer 2010-Summer 2011), Owen Pierce (Spring 2010-Summer 2011), Suhas Devangam (Fall 2009-present), Nick Donohue (Summer 2009-Summer 2010), Meryl Mabin (Spring-Summer 2009), Isaac Fine (Summer 2008-Summer 2011), Andrew Melfi (Summer 2008-Fall 2008), Eric Muller (Fall 2007-Spring 2010), Chris Barott (Summer 2007), Caitlin Grabowski (Summers 2007-2008), Michael Vo (Fall 2006-Spring 2009), Andrew Kreling (Fall 2006-Spring 2007), James Pita (Fall 2005-Spring 2007), Randee Bierlein (Fall 2006), Katherine Simonds (Summer 2006-Fall 2006), Steen Wichmann (Summer 2006-Fall 2006), Jason Rapai (Fall 2005-Spring 2006), Thomas Levoy (Fall

2004-Spring 2006), Art Covert (Spring 2004-Fall 2004), Matt Rupp (Spring 2003-Spring 2004), Sherri Goings (Spring 2003-Fall 2003), George Hagstrom (Summers 2003 and 2004), Anastasha Kamps (Summer 2002), Larry Wisne (Fall 2002-Spring 2003), and Matthew Norconk (Fall 1999-Spring 2001)

ACTIVE SOFTWARE PROJECTS

Evoke – Next generation digital evolution software   2014-Present
  https://github.com/mercere99/Evoke
Empirical - Tools for developing web-based scientific software   2014-Present
  https://github.com/mercere99/Empirical
TubeCode – A virtual assembly language designed for teaching principles of compilers.   2014-Present
  https://github.com/mercere99/TubeCode
EvoPuzzler – Evolved web-based puzzles (http://www.puzzleengine.com)   2006-Present
The Avida-ED Evolution Education Project (http://avida-ed.msu.edu/)   2003-Present
The Avida Digital Evolution Research Platform   1993-Present
  https://github.com/devosoft/avida

PEER-REVIEWED PUBLICATIONS

Total Citations: 3953 H-Index: 25   i10-Index: 49
(From Google Scholar as of Oct 8th, 2015)

81. Ostrowski EA, Ofria C, Lenski RE (2015) Genetically integrated traits and rugged adaptive landscapes in digital organisms, *BMC Evolutionary Biology*, **15**(1):83.

80. Zaman L, Meyer JR, Devengam S, Bryson DM, Lenski RE, and **Ofria C**. (2014) Coevolution Drives the Emergence of Complex Traits and Promotes Evolvability. *PLoS Biology*, 12.12: e1002023.

79. Biswas R, **Ofria C**, Bryson DM, and Wagner AP (2014). Causes vs Benefits in the Evolution of Prey Grouping. *ALife 14: The Fourteenth Conference on the Synthesis and Simulation of Living Systems*, pp. 641-648.

78. Goldsby HJ, Knoester DB, Kerr B, and **Ofria C** (2014) The Effect of Conflicting Pressures on the Evolution of Division of Labor. *PLoS ONE*, *9*(8), e102713.

77. Johnson AE, Goldsby HJ, Goings S, and **Ofria C**. (2014) The evolution of kin inclusivity levels. *Proceedings of the 2014 conference on Genetic and Evolutionary Computation*.

76. Bryson DM, Wagner AP, and **Ofria C** (2014) There and back again: gene processing hardware for the evolution and robotic deployment of robust navigation strategies. *Proceedings of the 2014 conference on Genetic and Evolutionary Computation*.

75. Goldsby HJ, Knoester DB, **Ofria C**, and Kerr B (2014) The Evolutionary Origin of Somatic Cells under the Dirty Work Hypothesis. *PLoS Biology*, *12*(5), e1001858.

74. Bryson DM and **Ofria C** (2013) Understanding Evolutionary Potential in Virtual CPU Instruction Set Architectures. *PLoS ONE*, *8*(12), e83242.

73. Covert AW, Lenski RE, Wilke CO, and **Ofria C** (2013) Experiments on the role of deleterious mutations as stepping stones in adaptive evolution. *Proceedings of the National Academy of Sciences*, *110*(34), E3171-E3178.

72. Taghizadeh M, Micinski K, Biswas S, **Ofria C**, and Torng E (2013) Distributed Cooperative Caching in Social Wireless Networks, *IEEE Transactions on Mobile Computing*, **12**(6):1037-1053.

71. Grabowski LA, Bryson DM, Dyer FC, Pennock RT, and **Ofria C** (2013) A Case Study of the De Novo Evolution of a Complex Odometric Behavior in Digital Organisms, *PLoS ONE*.

70. Fortuna MA, Zaman L, Wagner AP, and **Ofria C** (2013) Evolving Digital Ecological Networks, *PLoS Computational Biology*.

69. Chandler CH, **Ofria C**, and Dworkin I (2013) Runaway Sexual Selection Leads to Good Genes, *Evolution*.

68. Goldsby H, Dornhaus A, Kerr B, and **Ofria C** (2012) Task Switching Costs Promote the Evolution of Division of Labor and Shifts in Individuality, *Proc. Natl. Acad. Sci.* USA, **109**(34):13686-13691.

67. Clune J, Pennock RT, **Ofria C**, and Lenski RE (2012) Ontogeny Tends to Recapitulate Phylogeny in Digital Organisms, *The American Naturalist*, **180**:E54-E63.

66. Goings S, Goldsby HJ, Cheng BHC, and **Ofria C** (2012) An Ecology-based Evolutionary Algorithm to Evolve Solutions to Complex Problems, *Proceedings of the 13th International Conference for Artificial Life*, East Lansing, MI.

65. Bryson DM, and **Ofria C** (2012) Digital Evolution Demonstrates Surprising Robustness to Poor Design Decisions, *Proceedings of the 13th International Conference for Artificial Life*, East Lansing, MI.

64. Goldsby H, Serra N, Dyer F, Kerr B, and **Ofria C** (2012) The Evolution of Temporal Polyethism, *Proceedings of the 13th International Conference for Artificial Life*, East Lansing, MI.

63. Zaman L, **Ofria C**, and Lenski RE (2012) Finger-painting Fitness Landscapes: An Interactive Tool for Exploring Complex Evolutionary Dynamics, *Proceedings of the 13th International Conference for Artificial Life*, East Lansing, MI.

62. Walker B and **Ofria C** (2012) Evolutionary Potential is Maximized at Intermediate Diversity Levels, *Proceedings of the 13th International Conference for Artificial Life*, East Lansing, MI.

61. Yedid G, Stredwick J, Nanlohy K, and **Ofria C** (2012) A Comparison of the Effects of Random and Selective Mass Extinctions on Erosion of Evolutionary History in Communities of Digital Organisms. *PLoS ONE*.

60. Grabowski LM, Bryson DM, Dyer FC, Pennock RT, and **Ofria C** (2011) Clever Creatures: Case Studies of Evolved Digital Organisms. *Proceedings of the Proceedings of the 2011 European Conference on Artificial Life*.

59. Connelly BD, Zaman L, **Ofria C**, and McKinley PK (2011) Modeling the Evolutionary Dynamics of Plasmids in Spatial Populations. *Proceedings of the 2011 Genetic and Evolutionary Computation Conference.*

58. Zaman L, Devangam S, and **Ofria C** (2011). Rapid Host-Parasite Co-Evolution Drives the Production and Maintenance of Diversity in Digital Organisms. *Proceedings of the 2011 Genetic and Evolutionary Computation Conference.*

57. Clune J, Stanley KO, Pennock RT, and **Ofria C** (2011). On the Performance of Indirect Encoding across the continuum of regularity. *IEEE Transactions on Evolutionary Computation*, **15**:346-367. (73 Citations)

56. Clune J, Goldsby HJ, **Ofria C**, and Pennock RT (2011). Selective Pressures for Accurate Altruism Targeting: Empirical Support for Difficult-to-Test Aspects of Inclusive Fitness Theory, *Proceedings of the Royal Society of London*, **278**(1706):666-674.

55. Strelioff CC, **Ofria C**, and Lenski RE (2010). Evolutionary Dynamics, epistatic interactions, and Biological Information. *Journal of Theoretical Biology*, **266**(4):584-594.

54. Connelly BD, Zaman L, **Ofria C**, and McKinley PK (2010). Social Structure and the Maintenance of Biodiversity, The *Proceedings of the 12th International Conference on Artificial Life*, Odense, Denmark. Pages 461-468.

53. Grabowski LM, Bryson DM, Dyer F, Pennock RT, **Ofria C** (2010). Early Evolution of Memory Usage in Digital Organisms, The *Proceedings of the 12th International Conference on Artificial Life*, Odense, Denmark. Pages 224-231.

52. Clune J, Beckmann BE, McKinley PK, and **Ofria C** (2010). Investigating Whether HyperNEAT Produces Modular Neural Networks. The Proceedings of the 2010 Genetic and Evolutionary Computation Conference. Pages 634-642. (35 Citations)

51. Goldsby HJ, Knoester DB, and **Ofria C** (2010). Evolution of Division of Labor in Genetically Homogenous Groups. The Proceedings of the 2010 Genetic and Evolutionary Computation Conference.

50. Misevic D, **Ofria C**, and Lenski RE (2010). Experiments with Digital Organisms on the Origin and Maintenance of Sex in Changing Environments. *Journal of Heredity*. 101(supp 1):S46-54. doi:10.1093/jhered/esq017.

49. Clune J, Beckmann BE, Pennock RT, and **Ofria C** (2009). HybrID: A Hybridization of Indirect and Direct Encodings for Evolutionary Computation. Proceedings of the European Conference on Artificial Life (ECAL), 2009. Budapest, Hungary.

48. Goldsby H, Knoester DB, Clune J, McKinley PK, and **Ofria C** (2009). The Evolution of Division of Labor. Proceedings of the European Conference on Artificial Life (ECAL), 2009. Budapest, Hungary.

47. Clune J, Pennock R, and **Ofria C** (2009). The Sensitivity of HyperNEAT to Different Geometric Representations of a Problem. Proceedings of the 2009 Genetic and Evolutionary Computation Conference. (40 Citations)

46. Goldsby H, Goings S, Clune J, and **Ofria C** (2009). Problem Decomposition Using Indirect Reciprocity in Evolved Populations. Proceedings of the 2009 Genetic and Evolutionary Computation Conference, pages 105-112.

45. Clune J, Beckmann B, **Ofria C**, and Pennock R (2009). Evolving coordinated quadruped gaits using the HyperNEAT generative encoding. Proceedings of the IEEE Congress on Evolutionary Computations, Special Session on Evolutionary Robotics. (117 Citations)

44. Goings S and **Ofria C** (2009). Ecological Approaches to Diversity Maintenance in Evolutionary Algorithms. Proceedings of the IEEE Symposium on Artificial Life, pages 124-130.

43. Beckmann B, Grabowski L, McKinley P, and **Ofria C** (2009). Applying Digital Evolution to the Design of Self-Adaptive Software. Proceedings of the IEEE Symposium on Artificial Life.

42. Elsberry W, Grabowski L, **Ofria C**, and Pennock R (2009). Cockroaches, Drunkards, and Climbers: Evolving Simple Movement Strategies Using Digital Organisms. Proceedings of the IEEE Symposium on Artificial Life.

41. Yedid G, **Ofria C**, and Lenski RE (2009). Selective Press Extinctions, but Not Random Pulse Extinctions, Cause Delayed Ecological Recovery in Communities of Digital Organisms, *The American Naturalist*. **173**(4):E139-E154.

40. Clune J, Misevic D, **Ofria C**, Lenski RE, Elena SF, and Sanjuan R (2008). Natural Selection Fails to Optimize Mutation Rates for Long-Term Adaptation on Rugged Fitness Landscapes, *PLoS Computational Biology*, **4**(9): e1000187. doi:10.1371/journal.pcbi.1000187 (65 Citations)

39. Yedid G, **Ofria C**, and Lenski RE (2008). Historical and Contingent Factors Affect Re-Evolution of a Complex Feature Lost During Mass Extinction in Communities of Digital Organisms, *Journal of Evolutionary Biology*, **21**(5):1335-1357.

38. **Ofria C**, Huang W and Torng E. (2008). On the Gradual Evolution of Complexity and the Sudden Emergence of Complex Features. *Artificial Life*, 14(3) 255-263. doi:10.1162/artl.2008.14.3.14302

36. Grabowski LM, Elsberry WR, Pennock RT, and **Ofria C**. (2008) On the Evolution of Motility and Intelligent Tactic Response, *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2008), Atlanta GA, July 2008,* Pages 209-216. http://doi.acm.org/10.1145/1389095.1389129

35. Knoester DB, McKinley PK, and **Ofria C**. (2008) Cooperative Network Construction Using Digital Germlines, *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2008), Atlanta GA, July 2008,* Pages 217-224.

34. Beckmann B, McKinley PK, and **Ofria C**. (2008) Selection for Group-Level Efficiency Leads to Self-Regulation of Population Size, *Proceedings of the ACM Genetic and Evolutionary Computation Conference (GECCO-2008), Atlanta GA, July 2008,* Pages 185-192.

33. Clune J, Ofria C, and Pennock RT (2008) How a generative encoding fares as problem-regularity decreases. Proceedings of the 10th International Conference on Parallel Problem Solving From Nature. 358-367.

32. Goldsby HJ, Cheng BHC, McKinley PK, Knoester DB, and **Ofria C**. (2008) Digital Evolution of Behavioral Models for Autonomic Systems, *Proceedings of the 5th IEEE International Conference on Autonomic Computing, Chicago IL, June 2008.* Pages 86-96 (*Best paper award*).

31. McKinley PK, Cheng BHC, **Ofria C**, Knoester DB, Beckmann B, and Goldsby HJ. (2008) Harnessing Digital Evolution, *IEEE Computer*, **41**(1):54-63.

30. Clune J, **Ofria C**, and Pennock RT. (2007) Investigating the Emergence of Phenotypic Plasticity in Evolving Digital Organisms, *Lecture Notes in Computer Science (Proceedings of the 2007 European Conference on Artificial Life)*, **4648**:74-83.

29. Beckmann B, McKinley PK, and **Ofria C**. (2007b) Evolution of an Adaptive Sleep Response in Digital Organisms, *Lecture Notes in Computer Science (Proceedings of the 2007 European Conference on Artificial Life)*, **4648**:233-242.

28. Knoester DB, McKinley PK, Beckmann B, and **Ofria C**. (2007b) Directed Evolution of Communication and Cooperation in Digital Organisms, *Lecture Notes in Computer Science (Proceedings of the 2007 European Conference on Artificial Life)*, **4648**:384-394.

27. Beckmann BE, McKinley PK, Knoester DB, and **Ofria C.** (2007a) Evolution of Cooperative Information Gathering in Self-Replicating Digital Organisms. *Proceedings of the First IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO)*, Boston, Massachusetts, July 2007. Pages 65-76.

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INVITED PRESENTATIONS

June 4, 2015	Active LENS Workshop, East Lansing, MI
March 13, 2015	Research Lecture, University of Louisville, Louisville, KY
March 12, 2015	Public Lecture, University of Louisville, Louisville, KY
August 3, 2014	Artificial Life 14 Summer School, New York, NY.
April 18, 2014	Metron Corporation, Washington D.C.
April 16, 2014	University of Texas at Austin, Austin TX
June 23, 2013	SSE Evolution Education Symposium: Evolution Out of Bounds
May 9, 2013	Keynote for Genetic Programming in Theory and Practice (GPTP)
March 19, 2013	American Physical Society
March 16, 2012	MSU Community Club
July 29, 2011	Northrup Grumman Corporation
July 15, 2011	Genetic and Evolutionary Computation Conference
February 18-23, 2011	University of Washington (3 talks)
October 8, 2009	Google Tech Talk
March 12, 2009	North Carolina A&T State University
September 7, 2007	Keynote talk for Molecular Biology Retreat, Princeton University
February 2, 2007	Public Lecture at The Los Angeles Natural History Museum
November 29, 2006	University of Texas at Austin (2 talks)
November 27, 2006	Rice University
October 31, 2006	Massachusetts Institute of Technology, Artificial Intelligence Lab
October 30, 2006	Brandeis University, Department of Computer Science
September 28, 2006	The National Science Foundation, Workshop on Advancing Theory in Biology
August 26, 2006	DARPA Workshop on Microbial Cooperation
March 2, 2006	The Ohio State University
February 10, 2006	University of Arkansas at Little Rock
February 4, 2006	DARPA Workshop on Fitness Landscapes (Berkeley, CA)
November 14, 2005	Workshop on Self-Organization in Evolution (Mathematical Biosciences Inst.)
June 23, 2005	Workshop on the Road to Software Evolvability (Santa Fe Institute)
May 6, 2005	Microsoft Research
April 14, 2005	MIT Biological Engineering
February 24, 2005	The American Museum of Natural History
October 8, 2004	University of Idaho
September, 2004	Medical College of Ohio
May 21, 2004	LinkEcol Conference (European Science Foundation)
November 13, 2003	University of Akron
September 3, 2003	Yale University
November 15, 2002	Butler University
April 8, 2002	Stanford University