

Mario Ventresca

Curriculum Vitae

April 23, 2010

Contact Information

Pathogen Evolution Group
Department of Zoology
University of Cambridge
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Academic Qualifications

- PhD, Systems Design Engineering, University of Waterloo (2005-2009).
Supervisor: Dr. Hamid Tizhoosh
- MSc, Computing and Information Science, University of Guelph (2005).
Supervisor: Dr. Beatrice Ombuki-Berman, Co-advisor: Dr. Gary Grewal
- BSc, Honours with First Class Standing, Computer Science, Brock University (2003).
Concentration in Intelligent Systems

Academic and Research Distinctions and Awards

- Natural Sciences and Engineering Research Council of Canada Industrial Research and Development Fellowship (2010-2012).
- Ontario Graduate Scholarship in Science and Technology (2008-2009).
- Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship (2005-2008).
- University of Waterloo Faculty of Engineering Graduate Scholarship (Fall 2008).
- University of Waterloo President's Scholarship (2005-2008).
- University of Waterloo Graduate Scholarship (Fall 2006-Spring 2008).
- IEEE Computational Intelligence Outstanding Student-Paper Travel Grant Award, 2007.
- IEEE World Congress on Computational Intelligence Student Travel Grant Award, 2006.
- Ontario Graduate Scholarship (2003, 2004).
- University of Guelph Research Assistantship Award (2003, 2004).
- University of Guelph Teaching Assistantship Award (2003).
- Natural Sciences & Engineering Research Council of Canada Undergrad. Student Research Award (2003).
- Graduated with First Class Honors, Brock University (2003).
- Brock University Dean's Honor List (1999-2003).
- Brock University Dean's Scholarship for Academic Excellence (1999-2003).
- Brock University Entrance Scholarship (1999).
- Russ Anthony Memorial Scholarship for Excellence in Mathematics and Science (1999).

Positions Held

- Research Associate, Department of Zoology, University of Cambridge (2009-present).
- Graduate Teaching Assistant, Systems Design Engineering, University of Waterloo (2006-2009).
- Lecturer, Computer Science, Brock University (Summer 2005).
- Graduate Teaching Assistant, Computing and Information Science, University of Guelph (2003-2004).
- Teaching Assistant, Computer Science, Brock University (2001-2003).
- Research Assistant, Computer Science, Brock University (2001-2003).
- Lab Advisor, User Services, Brock University (1999-2001).
- Network Technician, Communications Department, Brock University (2000).
- Programmer, National Water Research Institute, Government of Canada (Summers 1999-2000).

Publications

- Submitted and In Preparation

1. M. Ventresca and H. R. Tizhoosh, *Symmetry Induction in Population-Based Search*, (journal, in preparation).
2. M. Ventresca, *Dynamic Environments and Limitations on Evolutionary Robotics*, (journal, in preparation).
3. B. Ombuki-Berman, A. Runka and M. Ventresca, *The Vehicle Routing Problem: A Comprehensive Fitness Landscape Analysis*, (journal, in preparation).
4. M. Ventresca and B. Ombuki-Berman, *Evolvability of Multi-Objective Recurrent Spiking Neuro-Controllers with Task Decomposition*, (submitted to Robotics and Autonomous Systems).
5. S. Rahnamayan, H. R. Tizhoosh, G.G. Wang and M. Ventresca, *Quasi-Oppositional Differential Evolution*, (submitted to IEEE Transactions on Evolutionary Computation).

- Edited Books

1. H. R. Tizhoosh and M. Ventresca, *Oppositional Concepts in Computational Intelligence*, Studies in Computational Intelligence, Springer-Verlag, 2008.

- Book Chapters

1. M. Ventresca, S. Rahnamayan and H. R. Tizhoosh, *The Use of Opposition for Decreasing Function Evaluations in Population-Based Search*, Computational Intelligence in Optimization-Applications and Implementations, Springer-Verlag, (to appear) 2010.
2. M. Ventresca and H. Tizhoosh *Two Frameworks for Improving Gradient-Based Learning Algorithms*, Oppositional Concepts in Computational Intelligence, Springer-Verlag, 2008.
3. H. R. Tizhoosh, M. Ventresca and S. Rahnamayan, *Opposition-Based Computing*, Oppositional Concepts in Computational Intelligence, Springer-Verlag, 2008.

- Refereed Journals

1. M. Ventresca, S. Rahnamayan and H. R. Tizhoosh, *A Note on Opposition Versus Randomness in Soft Computing Techniques*, Applied Soft Computing, 10(3):956-967, 2010.
2. M. Ventresca, H. R. Tizhoosh, *A Diversity Maintaining Population-Based Incremental Learning Algorithm*, Information Sciences, 178(21):4038-4056, 2008.
3. G. Grewal, S. Coros and M. Ventresca, *A Memetic Algorithm for Performing Memory Assignment in Dual-Bank DSPs*, International Journal of Computational Intelligence and Applications, 6(4):473-497, 2006.

4. M. Ventresca and B. Ombuki, *A Genetic Algorithm for the Design of Two Connected Networks with Bounded Rings*, International Journal of Computational Intelligence and Applications: Special Issue on Nature-Inspired Approaches to Networks and Telecommunications, 5(2):267-281, 2005.
5. B. Ombuki and M. Ventresca, *Local Search Genetic Algorithm for the Job Shop Scheduling Problem*, Journal of Applied Intelligence 21(1):99-109, 2004.

- Refereed Conference Proceedings

1. M. Ventresca and H. R. Tizhoosh, *Improving Gradient-Based Learning Algorithms for Large Scale Neural Networks*, IEEE International Joint Conference on Neural Networks, pp:1529-1536, Atlanta, USA, 2009.
2. A. Runka, B. Ombuki-Berman and M. Ventresca, *A Search Space Analysis for the Waste Collection Vehicle Routing Problem with Time Windows*, Genetic and Evolutionary Computation Conference, pp:1813-1814, Montreal, Canada, 2009.
3. M. Ventresca, H. R. Tizhoosh, *Numerical Condition of Feedforward Networks with Opposite Transfer Functions*, International Joint Conference on Neural Networks (IJCNN), pp:3232-3239, Hong Kong, China, 2008.
4. M. Ventresca and H. Tizhoosh, *Simulated Annealing with Opposite Neighbors*, IEEE Symposium on Foundations of Computational Intelligence, pp:186-192, Honolulu, USA, 2007.
5. M. Ventresca and H. Tizhoosh, *Opposite Transfer Functions and Backpropagation Through Time*, IEEE Symposium on Foundations of Computational Intelligence, pp:570-577, Honolulu, USA, 2007.
6. M. Ventresca and B. Ombuki-Berman, *Search Difficulty of Two-Connected Ring-based Topological Network Designs*, IEEE Symposium on Foundations of Computational Intelligence, 267-274, Honolulu, USA, 2007.
7. M. Ventresca and B. Ombuki-Berman, *Epistasis in Multi-Objective Evolutionary Recurrent Neuro-Controllers*, IEEE Symposium on Artificial Life, pp:77-84, Honolulu, USA, 2007.
8. M. Ventresca and H. R. Tizhoosh, *Improving the Convergence of Backpropagation by Opposite Transfer Functions*, International Joint Conference on Neural Networks, pp:9527-9534, Vancouver, Canada, 2006.
9. M. Ventresca and B. Ombuki, *Search Space Analysis of Recurrent Spiking and Continuous-time Neural Networks*, International Joint Conference on Neural Networks, pp:8947-8954, Vancouver, Canada, 2006.
10. G. Grewal, S. Coros, D. Banerji, A. Morton and M. Ventresca, *Optimized Memory Assignment for DSPs*, Congress on Evolutionary Computation, pp:371-379, Vancouver, Canada, 2006.
11. M. Ventresca and B. Ombuki, *A Genetic Algorithm for the Design of Two Connected Networks with Bounded Rings*, Workshop on Nature Inspired Approaches to Networks and Telecommunications, 8th International Conference on Parallel Problem Solving from Nature (PPSN VIII), Birmingham, UK, 2004.
12. M. Ventresca and B. Ombuki, *Ant Colony Optimization for Job Shop Scheduling Problem*, Proceedings of 8th IASTED Intl. Conf. On Artificial Intelligence and Soft Computing, (ASC 2004), CDROM:451-152. Marbella, Spain, 2004.

- Non-refereed Publications

1. M. Ventresca and B. Ombuki, *Meta-heuristics for the Job Shop Scheduling Problem*, Proceedings of Late Breaking Papers, Genetic and Evolutionary Computation Conference, pp.303-306, Chicago, USA, 2003.

- Theses

1. PhD, *Symmetry Induction in Computational Intelligence*, University of Waterloo, 2009.
2. MSc, *The Evolution of Continuous-time and Spiking Recurrent Neural Networks on Mutation Landscapes*, University of Guelph, 2005.
3. BSc, *Ant Colony Optimization for the Job-Shop Scheduling Problem*, Brock University, 2003.

Talks

- *Symmetry Induction in Computational Intelligence*, Swiss Institute for Artificial Intelligence (August 2009).
- *Evolutionary Characteristics of Neuro-Controllers using Task Decomposition*, Institute for Aerospace Studies, University of Toronto (July 2009).
- *Evolutionary Robotics, Embodied Cognition and Beyond*, Department of Computer Science, Brock University (November 2007).
- *Evolving Continuous-time and Spiking Recurrent Neural Networks*, Pattern Analysis and Machine Intelligence Group, Department of Systems Design Engineering, University of Waterloo (October 2005).
- *A Genetic Algorithm for the Design of Two Connected Networks with Bounded Rings*, Workshop on Nature Inspired Approaches to Networks and Telecommunications, 8th International Conference on Parallel Problem Solving from Nature (PPSN VIII), Birmingham, UK (September 2004).
- *Empowering Ants to Perform Local Search*, Computing and Information Science Seminar, University of Guelph (March 2004).
- *Efficient Meta-Heuristics for Combinatorial Optimization Problems* - with Dr. Beatrice Ombuki, Brock University (May 2003).

Teaching

- Courses Taught

1. COSC 2P03, *Advanced Data Structures*, Computer Science, Brock University (Spring 2005).

- Teaching Assistantships

1. SYDE 311, *Engineering Optimization*, University of Waterloo (Spring 2009).
2. SYDE 223, *Data Structures and Algorithms*, University of Waterloo (Winter 2009).
3. MTE 140, *Data Structures and Algorithms*, University of Waterloo (Spring 2006, 2007, 2008).
4. SYDE 213, *Probability*, University of Waterloo (Winter 2008).
5. SYDE 111, *Calculus 1*, University of Waterloo (Fall 2007).
6. SYDE 121, *Digital Computation*, University of Waterloo (Fall 2006, 2008).
7. CIS 1900, *Discrete Structures in Computer Science*, University of Guelph (Winter 2003).
8. CIS 4750, *Introduction to Artificial Intelligence*, University of Guelph (Fall 2003).
9. COSC 2P03, *Advanced Data Structures*, Brock University (Spring and Fall 2001-02, Spring 2003).
10. COSC 2P90, *Computer Languages and Object-Oriented*, Brock University (Fall 2002).
11. COSC 3P40, *Advanced Object-Oriented Programming*, Brock University (Winter 2001, 2002).

- Teaching-Related Activities

1. TA Mentor, *ExpecTAtions Teaching Assistant Course*, University of Waterloo (Fall 2007).
2. Substitute Lectures, MTE 140 *Data Structures and Algorithms*, University of Waterloo (Spring 2006, 2008).
3. Guest Lecture, *Search Space Analysis*, University of Guelph (March 2006).
4. Substitute Lectures, COSC 4V80 *Artificial Neural Networks*, Brock University (Winter 2005).
5. Nominated, *Teaching Assistant of The Year*, Brock University (2002).
6. Conducted a Workshop, *JWorkshop: Problem Solving and Java*, Brock University (November 2002).

Student Supervision

- Johnston, E., *Determining Alignment Model for Statistical Machine Translation by Genetic Programming*, 4th year course project (Machine Intelligence), 2007. (Next position: Google.com)
- Turcot, P., *Influence of Opposite Maps on Bounded Continuous Functions*, 4th year course project (Machine Intelligence), 2007. (Next position: MSc University of British Columbia)

Other Scholarly Activities

- Member, International Neural Network Society (2009-present).
- Member, Association for the Advancement of Artificial Intelligence (2007-present).
- Member, IEEE Computational Intelligence Society (2006-present).
- Member, IEEE Systems, Man, and Cybernetics Society (2006-present).
- Member, Computer Science Curriculum Committee, Brock University (2005).
- Member, Computer Science Recruitment Committee, Brock University (2005).
- Editorial Board Member:
 - A. P. Engelbrecht, M. Middendorf (Eds), *Applied Swarm Intelligence*, Studies in Computational Intelligence, Springer-Verlag, 2009.
 - R. Chbeir, A. Hassanien, A. Abraham and Y. Badr (Eds), *Emergent Web Intelligence*, Studies in Computational Intelligence, Springer-Verlag, 2008.
- Journal Reviewer:
 - Swarm Intelligence.
 - IEEE Transactions on Systems, Man and Cybernetics.
 - International Journal of Computational Intelligence and Applications.
 - Journal of Intelligent and Fuzzy Systems.
- Conference Program Committee/Referee:
 - 2010 Seventh International Conference on Swarm Intelligence.
 - 2009 IEEE International Joint Conference on Neural Networks.
 - 2009 IEEE Symposium on Computational Intelligence for Image Processing.
 - 2009 World Congress on Nature and Biologically Inspired Computing.
 - Fifth IEEE International Conference on Soft Computing as Transdisciplinary Science and Technology.
 - Seventh International Conference on Intelligent Systems Design and Applications.
 - 2007 IEEE International Joint Conference on Neural Networks.
 - Sixth International Conference on Intelligent Systems Design and Applications.
- Conference Session Chair:
 - Fifth IEEE International Conference on Soft Computing as Transdisciplinary Science and Technology (Invited, declined - prior obligations).

Personal Interests

- Billiards, Texas Hold'em, Hockey, Football.
- Theoretical Physics, History of Mathematics, Ancient Civilizations, Education.
- Chess, Go, Movies, Music.