CURRICULUM VITAE

Dr. Shahryar Rahnamayan, PEng, SMIEEE

PhD (Nominated to PhD Alumni Gold Medal, University of Waterloo)
M.Sc. (First Class Honour), B.Sc. (First Class Honour), A.A. (First Class Honour)

GENERAL INFORMATION

Visiting Researcher (2014-2016), ECE Department
Michigan State University, East Lansing, MI, USA
Associate Professor (early tenured)
Department of Electrical, Computer, and Software Engineering
University of Ontario Institute of Technology (UOIT), Oshawa, Canada
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Summary of Qualifications and Achievements

- **Education-based**
  - Massachusetts Institute of Technology (MIT) Professional Education Certificate in Tackling the Challenges of Big Data
  - Postdoctoral Fellow, Simon Fraser University, Canada
  - Nominated to PhD Alumni Gold Medal, University of Waterloo, Canada
  - CIHR Strategic Training Fellow, Robarts Research Institute, Canada
  - First Class Honour in M.Sc. Degree, Software Engineering
  - First Class Honour in B.Sc. Degree, Software Engineering
  - Ranked in top 1% in Nationwide M.Sc. Entrance exam
  - First Place in Mathematics in the Technical Institutes National Competition
  - First Place in Physics in the Institutional Competition
- **Research-based**
  - Nominated for the UOIT Research Excellence Award, 2015
  - Publications impact: 102 publications, 2199 citations, 219 Cites/year
  - One of the top journal publications is ranked 26^{th} out of $144,718$ IEEE publications in term of citations (by searching the keyword of "optimization" in period $2008-2015$).
  - Pioneered a well-accepted successful branch in Optimization, call Opposition-based Computation
  - IP holder in a spin-off company established by University of Waterloo (FDA approval has been obtained), 2007
  - Received more than 35 Honors and Awards, including, NSERC-DG, NSERC-UNENE, MRI-OCIF, NSERC-JSPS, NSERC-IPS, NSERC-IRDF, NSERC-VF, OGS (twice), CIHR (two years), OGSST (twice), FedDev, UOIT-AIA, UoW-GIS, OCE-IDF

- **Teaching-based**
  - Nominated for the UOIT Teaching Excellence Award, 2013
  - Developed and taught ten new courses
  - Teaching quality is assessed OUTSTANDING based on the Dean's evaluation
  - Received many excellent positive comments from students
  - Published two conference papers in a conference in engineering education
  - Developing two teaching-related software systems (Students' Academic Performance Monitoring System and Class Scheduling and Visualization System, both as capstone projects)
  - Active member of American Society for Engineering Education (ASEE) and Canadian Engineering Education Association (CEEA)
- **Supervision-based**
  - HQP Training - PDF: 6, PhD: 9, MASc: 10, Research Associates: 2, Capstone Projects: 30, Undergraduate Summer Research: 13 (total: 70)
  - Two times the first place (2013 and 2014) and one time the second place (2012) awards in the annual capstone competitions
  - Faculty first place award in annual university-wide research showcase, 2010
  - Receiving $19K for supporting a capstone project (2014)
- **Service-based**
  - Grant Reviewer: NSERC-DG, NSERC-I2I, MITACS Accelerate Research, NSERC Strategic Grant
  - Paper Reviewer: more than 35 international journals and more than 25 international conferences
  - Member of Technical Program Committee: more than 30 conferences

ACADEMIC POSITIONS

- **Visiting Researcher** ..... Aug. 2014 - present
  - Michigan State University, East Lansing, MI, USA
  - Department of Electrical and Computer Engineering
  - Hosting by Professor Kalyanmoy Deb
  - Research topics: Multi-objective Optimization and Large-Scale Visualization
  - A member of the BEACON center (http://beacon-center.org/), a center for the study of evolution in action. BEACON is an NSF Science and Technology Center, headquartered at Michigan State University with partners at North Carolina A&T State University, University of Idaho, University of Texas at Austin, and University of Washington.
- **Associate Professor, UOIT, Oshawa** ..... July 2013 - present
- **Assistant Professor** ..... Sept. 2008 - June 2013
  - UOIT, Oshawa, Ontario
  - Department of Electrical, Computer, and Software Engineering
  - Course taught: Introduction to Artificial Intelligence, Advanced Optimization, Soft Computing, Data Structures, Design and Analysis of Algorithms, Software Design II, Engineering Design, Computer and Software Security, Software Engineering Systems Design I and II, C++ Programming for Engineers
  - Conducting research in Software Engineering with focus on Machine Learning, Metaheuristics, Image Processing

- Supervising graduate and undergraduate students
- Providing Service

◦ **Adjunct Assistant Professor** ..... Sept. 2009 - present
- University of Waterloo, Waterloo, Ontario
- Supervising graduate students
- Department of Systems Design Engineering
- Conducting research and applying for grants in Machine Learning and Medical Image Processing

◦ **Adjunct Assistant Professor** ..... Sept. 2009 - present
- Ryerson University, Toronto, Ontario
- Department of Mechanical and Industrial Engineering
- Supervising graduate students
- Conducting research and applying for grants in Machine Learning, Robotic Design, and Medical Image Processing

◦ **Postdoctoral Fellow** ..... March - Aug. 2008
- Simon Fraser University, Vancouver, British Columbia
- Mechatronic Systems Engineering, School of Engineering Science
- Conducting research in Expensive Optimization, Meta-modeling, Sampling methods, and Evolutionary Computation

◦ **Research Assistant** ..... Jan. 2003 - Apr. 2007
- University of Waterloo, Waterloo, Ontario
- Department of Systems Design Engineering
- Conducting research in Machine Learning, Evolutionary Computation, and Image Processing
- Supervising M.Sc. and undergraduate students

◦ **Research Fellow** ..... Jan. 2003 - Dec. 2005
- Robarts Research Institute, London, Ontario
- Department of Medical Imaging
- Conducting research in Research Ethics and Biostatistics, Vascular Research, Intravascular Image Segmentation, and Medical Imaging Modalities

RESEARCH INTERESTS

◦ Optimization
◦ Machine Learning
◦ Tackling the Challenges of Big Data: Visualization, Processing, and Analytic
◦ Opposition-Based Computation
◦ Large-scale Optimization
◦ Artificial Intelligence
◦ Interactive Optimization
◦ Multi-Objective, Non-Convex, Nonlinear, and Complex Optimization with its real-world applications
◦ Parallel Processing
◦ Simulation of Discrete and Continuous Systems
◦ Nature-Inspired Problem Solving

- Medical Image Processing and Computer Vision

EDUCATION

- **Massachusetts Institute of Technology (MIT) Professional Education Certificate in Tackling the Challenges of Big Data** ..... Nov. - Dec. 2014
  - Massachusetts Institute of Technology (MIT)
  - Modules: 1) Introduction and Use Cases, 2) Big Data Collection, 3) Big Data Storage, 4) Big Data Systems, 5) Big Data Analytic, 6) Security and Privacy
- **Postdoctoral Fellow** ..... March - Aug. 2008
  - Simon Fraser University, Vancouver, British Columbia
  - Mechatronic Systems Engineering, School of Engineering Science
  - Conducting research in Expensive Optimization, Meta-modeling, Sampling methods, and Evolutionary Computation
  - Supervisor: Prof. Gary G. Wang
- **Ph.D. in Systems Design Engineering** ..... 2003 - 2007
  - University of Waterloo, Waterloo, Ontario
  - Department of Systems Design Engineering
  - Pattern Analysis and Machine Intelligence (PAMI) Research Group
  - Areas of Specialization: Opposition-Based Learning, Metaheuristics, Image Processing, and Optimization
  - Dissertation Title: Opposition-Based Differential Evolution
  - Supervisors: Prof. Magdy M.A. Salama and Prof. Hamid R. Tizhoosh
  - **Nominated for PhD Alumni Gold Medal**
- **CIHR Strategic Training Fellow** ..... 2003 - 2005
  - Robarts Research Institute, London, Ontario
  - Department of Medical Imaging
  - CIHR Strategic Training Program in Vascular Research
  - Areas of Specialization: Ethics and Biostatistics, Vascular Research, Intravascular Image Segmentation, and Medical Imaging Modalities
  - Program Director: Prof. Aaron Fenster
- **M.A.Sc. in Software Engineering** ..... 1999 - 2001
  - Shaheed Beheshti University, Tehran, Iran
  - Department of Electrical and Computer Engineering
  - Thesis Title: Proposing Optimal Load Balancing for Distributed High-load Web-Servers
  - Supervisors: Prof. Feridoon Shams and Prof. Eslam Nazemi
  - **First Class Honour**
- **B.Sc. in Software Engineering** ..... 1994 - 1998
  - Shaheed Beheshti University, Tehran, Iran
  - Department of Electrical and Computer Engineering
  - Final Project Title: Proposing an Intelligent Chess Algorithm
  - Supervisor: Prof. Shahla Tabatabaei
  - **First Class Honour**
- **Associate Degree in Electrical Power Systems** ..... 1990 - 1992
  - Technical Institute of Tabriz, Tabriz, Iran

- **First Class Honour**

HONORS and AWARDS

A40. Nominated for UOIT Research Excellence Award, UOIT, 2015.

A39. The first place in Annual Capstone Projects Competition, UOIT, April 2014.

A38. Nominated for UOIT Research Excellence Award, UOIT, 2013.

A37. Nominated for UOIT Teaching Excellence Award, UOIT, 2013.

A36. The first place in Annual Capstone Projects Competition, UOIT, April 2013.

A35. Achievement Increment Award, $2,000/year, UOIT, Oshawa, July 2012.

A34. The second place in Annual Capstone Projects Competition, UOIT, April 2012.

A33. Best Poster Award in the 6th Annual Research Showcase, UOIT, Aug. 2009.

A32. NSERC's Japan Society for the Promotion of Science (JSPS) Fellowship (awarded only to 15 Canadians each year), University of Tokyo (Host Researcher: Prof. Hitoshi IBA), $40,000/year for two years, April 2008 (declined).

A31. NSERC's Industrial R&D Fellowship (IRDF), $60,000/year for two years, March 2008 (declined).

A30. NSERC's Visiting Fellowship in Canadian Government Laboratories (VF), $43,724, Feb. 2008 (declined).

A29. Postdoctoral Fellowship, $41,000, Simon Fraser University, March 2008.

A28. Nominated for PhD Alumni Gold Medal [unfortunately, it was rejected because of the late submission of the application to the Graduate School Office.], Aug. 2007.

A27. Best Presentation Award, National Computer Symposium, May 2007.

A26. IEEE WCCI 2006 Student Travel Grant, $450, IEEE World Congress on Computational Intelligence, Vancouver, 2006.

A25. Best Session Presentation Award, IEEE World Congress on Computational Intelligence, Vancouver, 2006.

A24. Ontario Graduate Scholarship (OGS), $15,000, University of Waterloo, 2006.

A23. Ontario Graduate Scholarship in Science and Technology (OGSST), $5,000, University of Waterloo, 2006 (declined).

A22. President's Graduate Scholarship, $10,000, (University of Waterloo's highest award for outstanding graduate students), 2006.

A21. Faculty of Engineering Graduate Scholarship, $1,000, University of Waterloo, 2006.

A20. Faculty of Engineering Graduate Scholarship, $1,000, University of Waterloo, 2005.

A19. Ontario Graduate Scholarship (OGS), $15,000, University of Waterloo, 2005.

A18. Ontario Graduate Scholarship in Science and Technology (OGSST), $5,000, University of Waterloo, 2005 (declined).

A17. Award for Successful Supervision of Azarbijans' Team on Kharazmi National Competition (first place among 30 provinces), Tabriz, Iran, 2005.

A16. University of Waterloo Graduate Scholarship, $1,000, University of Waterloo, Canada, 2005.

A15. Canadian Institute of Health Research (CIHR) Fellowship, $10,000, (awarded to outstanding graduate students across Canada), University of Waterloo, 2004.

A14. Best Presentation Award, National Computer Symposium for Teachers, Iran, 2004.

A13. NSERC's Industrial Postgraduate Scholarships (IPS), University of Waterloo, Canada, 2004 (declined).

A12. Graduate Incentive Award (GIA), $1,666, University of Waterloo, Canada, 2003.

A11. Finalist for NSERC Postgraduate Scholarships, University of Waterloo, Canada, 2003.

A10. Canadian Institute of Health Research (CIHR) Fellowship, $10,000, University of Waterloo, 2003.

A9. Award of Ranked First of Class in M.A.Sc. Degree, Shaheed Beheshti University, Tehran, Iran, 2001.

A8. Ranked in top 1% in nationwide Electrical and Computer Engineering M.Sc. entrance exam, 1999.

A7. Award of Ranked First of Class in B.Eng. Degree, Shaheed Beheshti University, Tehran, Iran, 1998.

A6. Award for Designing and Implementation of High Quality Storage Management Software, Ministry of Energy, Tehran, Iran, 1997.

A5. Award of Ranked First of Class in A.A. Degree, Technical Institute of Tabriz, Iran, 1992.

A4. Award of First Place in Mathematics in the Institutional Competition Technical Institute of Tabriz, Iran, 1992.

A3. Award of First Place in Mathematics in the Second Round of Technical Institutes National Scientific Competition, Shiraz, Iran, 1991.

A2. Award of First Place in Mathematics in the Institutional Competition, Technical Institute of Tabriz, Iran, 1991.

A1. Award of First Place in Physics in the Institutional Competition, Technical Institute of Tabriz, Iran, 1990.

Summary of Publications

♢ Refereed Journal Publications: 43

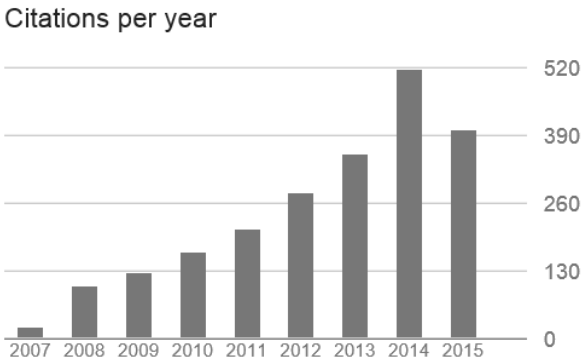
♢ Refereed Conference Publications: 60

♢ Books: 2

♢ Book Chapters: 8

♢ Citations : Received 2199 (219 citations per year)

Citations per year, based on the Google Scholar report (Sept. 23, 2015)



Articles in Refereed Journals

- **Published/Accepted**

J43. F. Khalvati, A. Salmanpour, **S. Rahnamayan**, M. A. Haider, H.R. Tizhoosh, "Sequential Registration-based Segmentation of Prostate Gland in MR Images," *Journal of Digital Imaging*, Sep. 2015 [accepted].

J42. A. Ibrahim, **S. Rahnamayan**, M.V. Martin, B. Yilbas,"Multi-objective Thermal Analysis of A Thermoelectric Device: Influence of Geometric Features on Device Characteristics," *Energy International Journal -ELSEVIER*, Oct. 2014, pp. 1-13.

J41. X. Zhou, Z. Wu, H. Wang, **S. Rahnamayan**,"Gaussian bare-bones artificial bee colony algorithm," *Soft Computing*, Dec. 2014, pp. 1-18.

J40. S. Mahdavi, M. E. Shiri, **S. Rahnamayan**, "Metaheuristics in Large-Scale Global Continues Optimization: A Survey," *Journal on Information Sciences - Elsevier*, vol. 295, 2015, pp. 407-428.

J39. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "Optimal Design Methods for Hybrid Renewable Energy Systems," *International Journal of Green Energy - Taylor & Francis Group (IJGE)*, 11(9), ISSN: 1543-5075, April 2014, pp. 148-159.

J38. H. Wang, Z. Wu, **S. Rahnamayan**, H. Sun, Y. Liu, J.-s. Pan, "Multi-Strategy Ensemble Artificial Bee Colony Algorithm," *Journal of Information Sciences - Elsevier*, Vol. 279, Sept. 2014, pp. 587-603.

J37. **S. Rahnamayan**, J. Jesuthasan, F. Bourennani, G. F. Naterer, H. Salehinejad, "Centroid-Opposition Based Differential Evolution," *International Journal of Applied Metaheuristic Computing*, Vol. 5, Issue 4, 25 pages, 2014.

J36. A. Sriram, **S. Rahnamayan**, F. Bourennani,"Artificial Neural Networks for Earthquake Anomalies Detection," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, Sep. 2014, Vol. 18, No. 5, pp. 701-713.

J35. X. Zhou, Z. Wu, H. Wang, **S. Rahnamayan**, "Enhancing Differential Evolution with Role Assignment Scheme," *Journal of Soft Computing - Elsevier*, 06 Dec. 2013, pp. 1-17 .

J34. H. Wang, W. Wang, Z. Cui, H. Sun, **S. Rahnamayan**, "Heterogeneous Differential Evolution for Numerical Optimization," *Scientific World Journal, the special issue in Recent Advances on Bioinspired Computation"*, Vol. 2014, 7 pages.

J33. F.S. Al-Qunaieer, H.R. Tizhoosh, **S. Rahnamayan**, "Multi-Resolution Level Sets with Shape Priors: A Validation Report for 2D Segmentation of Prostate Gland in T2W MR Images," *Journal of Digital Imaging*, 28 May 2014, 27:833847.

J32. F. Khalvati, A. Salmanpour, **S. Rahnamayan**, G. Rodrigues, H.R. Tizhoosh, "Inter-slice Bidirectional Registration-based Segmentation of the Prostate Gland in MR and CT Image Sequences," *Journal of Medical Physics*, Vol. 40, Issue 12, 13 Nov. 2013.

J31. H. Wang, W. Wang, H. Sun, **S. Rahnamayan**,"Firefly Algorithm with Random Attraction," *International Journal of Bio-Inspired Computation*, Sept. 2013 (in press).

J30. A. Ibrahim, F. Bourennani, **S. Rahnamayan**, G. F. Naterer,"Optimal Photovoltaic System Design with Multi- Objective Optimization," *International Journal of Applied Metaheuristic Computing*, Vol. 4, Issue 4, 2013, 27 pages.

J29. H. Mushtaq, **S. Rahnamayan**, A. Siddiqi,"Color Separation in Forensic Image Processing Using Interactive Differential Evolution," *Journal of Forensic Sciences*, Nov. 2014, pp. 1-7.

J28. H. Wang, H. Sun, C. Li, **S. Rahnamayan**, J.-S. Pan, "Diversity Enhanced Particle Swarm Optimization with Neighborhood Search ," *Journal on Information Sciences - Elsevier*, Vol. 223, Feb. 2013, pp. 119-135.

J27. H. Wang, **S. Rahnamayan**, Hui Sun, Mahamed G.H. Omran,"Gaussian Barebones Differential Evolution," *IEEE Transactions on Systems, Man and Cybernetics*, Part B, Vol. 43, April 2013, pp. 634-647.

J26. A. Darvish, **S. Rahnamayan**,"Optimal Parameter Setting of Active-Contours Using Differential Evolution and Expert-Segmented Sample Image," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, Vol. 16, No. 6, 2012, pp. 677-686.

J25. H. Wang, **S. Rahnamayan**, and S. Zeng, "Generalized Opposition-Based Differential Evolution: An Experiment4al Study," *International Journal of Computer Applications in Technology (IJCAT)*, Vol. 43, No. 4, June 2012, pp. 311-319.

J24. **S. Rahnamayan**, G.G. Wang, M. Ventresca, "An Intuitive Distance-Based Explanation of Opposition-Based Sampling," *Journal on Applied Soft Computing - Elsevier*, Vol. 12, Issue 9, Sept. 2012, pp. 2828-2839.

J23. H. Wang, **S. Rahnamayan**, "Parallel Differential Evolution with Self - Adapting Control Parameters and Generalized Opposition-Based Learning for Solving High-Dimensional Optimization Problems,"*Journal of Parallel and Distributed Computing - Elsevier*, 73(1), 2013, pp. 62-73.

J22. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "OGDE3: Opposition-Based Third Generalized Differential Evolution," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, Vol. 16 No. 3, 2012, pp. 469-480.

J21. H. Wang, Z. Wu, **S. Rahnamayan**, C. Lic, S. Zeng, D. Jiang, "Particle Swarm Optimization with Simple and Efficient Neighborhood Search Strategies," *International Journal of Innovative Computing and Applications (IJICA)*, Vol. 3, No. 2, 2011, pp. 97-104.

J20. M. Kazemi, G.G. Wang, **S. Rahnamayan**, Kamal Gupta, "Metamodel-Based Optimization for Problems With Expensive Objective and Constraint Functions," *ASME Journal of Mechanical Design*, Vol. 133, Issue 1, Jan. 2011, 7 pages.

J19. W. Wang, H. Wang, **S. Rahnamayan**, "Improving Comprehensive Learning Particle Swarm Optimizer Using Generalized Opposition-based Learning," *International Journal of Modelling, Identification and Control (IJMIC)*, Vol. 14, No. 4, 2011, pp. 310-317.

J18. H. Wang, Z. Wu, **S. Rahnamayan**, and Y. Liuc, M. Ventresca, "Enhancing Particle Swarm Optimization by Using Generalized Opposition-based Learning," *Journal on Information Sciences - Elsevier*, Vol. 181, Issue 20, Oct. 2011, pp. 4699-4714.

J17. H. Wang, Z. Wu, and **S. Rahnamayan**, "Enhanced Opposition-Based Differential Evolution for Solving High-Dimensional Continuous Optimization Problems," *Special Issue of Soft Computing on Scalability of Evolutionary Algorithms and other Metaheuristics for Large Scale Continuous Optimization Problems, Springer Verlag*, Sept. 2010, pp. 1-14.

J16. M. Ventresca, **S. Rahnamayan**, H.R. Tizhoosh, "A Note on Opposition versus Randomness in Soft Computing Techniques," *Journal on Applied Soft Computing - Elsevier*, Vol. 10, Mar. 2010, pp. 956-957.

J15. **S. Rahnamayan**, G.G. Wang, "Toward Effective Initialization for Large-Scale Search Spaces," *World Scientific and Engineering Academy and Society, Transactions on Systems*, Vol. 8, Issue 3, Mar. 2009, pp. 355-367, ISSN: 1109-2777.

J14. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Automatic Acquisition of Image Filtering and Object Extraction Procedures from Ground-Truth Samples," *Journal of Advanced Computational Intelligence and Intelligent Informatics*, Vol. 13, No. 2, Mar. 2009, pp. 115-127.

J13. **S. Rahnamayan**, G.G. Wang, "Solving Large Scale Optimization Problems by Opposition-Based Differential Evolution (ODE)," *World Scientific and Engineering Academy and Society, Transactions on Computers*, Vol. 7, Issue 10, Oct. 2008, pp. 1792-1804.

J12. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Opposition-Based Differential Evolution," *IEEE Transactions on Evolutionary Computation*, Vol. 12, Issue 1, Feb. 2008, pp. 64-79.

J11. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Opposition versus Randomness in Soft Computing Techniques," *Journal on Applied Soft Computing - Elsevier*, Volume 8, Mar. 2008, pp. 906-918.

J10. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "A Novel Population Initialization Method for Accelerating Evolutionary Algorithms," *Journal on Computers and Mathematics with Applications - Elsevier*, Vol. 53, Issue 10, May 2007, pp. 1605-1614.

J9. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Towards Incomplete Object Recognition," *World Scientific and Engineering Academy and Society, Transactions on Systems*, Vol. 4, Issue 10, Oct. 2005, pp. 1725-1732.

J8. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Learning Robust Object Segmentation from User-Prepared Samples," *WSEAS Transactions on Computers*, Vol. 4, Issue 9, Sep. 2005, pp. 1163-1170.

- **Submitted**

J7. S. Mahdavi, **S. Rahnamayan**, M. E. Shiri, "Multilevel Framework for Large-Scale Global Optimization," *Applied Soft Computing - Elsevier*, Jan. 2015.

J6. S. Mahdavi, **S. Rahnamayan**, M. E. Shiri, "Incremental Cooperative Coevolution for Large-Scale Global Optimization," *IEEE Transactions on Evolutionary Computation*, Jan. 2015.

J5. Z. Alfughi, **S. Rahnamayan**, B. Yilbas, "Design of a parabolic shape solar collector for solar farm applications," *Energy Journal*, April 2015.

J4. Z. Alfughi, **S. Rahnamayan**, B. Yilbas, "Optimal Solar Panel and Farm Design: A Survey," *Solar Energy Journal*, Jan. 2015.

J3. S. Mahdavi, M. E. Shiri, **S. Rahnamayan**, "Cooperative Co-evolution with Sensitivity Analysis-based Budget Assignment Strategy for Large-Scale Global Optimization," *Journal on Information Sciences - Elsevier*, Dec. 2014 (the second revision submitted).

J2. H. Salehinejad, **S. Rahnamayan**, H.R. Tizhoosh, "Micro-Differential Evolution: Diversity Enhancement and Comparative Study," *IEEE Transactions on Cybernetics*, Sept. 2014.

J1. F.S. Al-Qunaieer, H.R. Tizhoosh, **S. Rahnamayan**, "Automated Resolution Selection for Image Segmentation," *IEEE Transactions in Image Processing*, Aug. 2014.

Refereed Conference Publications

C60. H.R. Tizhoosh, **S. Rahnamayan**, "Learning Opposites with Evolving Rules," *IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2015)*, Istanbul, Turkey, Aug. 2-5, 2015 [accepted].

C59. H. Wang, W. Wang, H. Sun, C. Li, **S. Rahnamayan**, Y. Liu, "A Modified Cuckoo Search Algorithm for Flow Shop Scheduling Problem with Blocking," *IEEE Congress on Evolutionary Computation (IEEE CEC)*, Sendai, Japan, May 25-28, pp. 456 - 463.

C58. H. Liu, Z. Wu, H. Wang, **S. Rahnamayan**, C. Deng, "Rotation-based Learning: A Novel Extension of Opposition-based Learning," *The 13th Pacific Rim International Conference on Artificial Intelligence*, Lecture Notes in Computer Science, Vol. 8862, Gold Coast, Queensland, Australia, December 1-5, 2014, pp 511-522.

C57. S. Shahbazpanahi, **S. Rahnamayan**, "Finding Optimal Transformation Function for Image Thresholding Using Genetic Programming," *2014 IEEE Symposium Series on Computational Intelligence*, Orlando, Florida, December 9-12, 2014, pp. 106-113.

C56. H. Salehinejad, R. Zadeh, R. Liscano, **S. Rahnamayan**, "3D Localization in Large-Scale Wireless Sensor Networks Using Micro-Differential Evolution Algorithm," *2014 IEEE 25th International Symposium on Personal, Indoor and Mobile Radio Communications - (PIMRC): Mobile and Wireless Networks*, Capital Hall, Washington, DC, Sept. 2-5, 2014, pp. 1824-1828.

C55. Z. Saadatnia, **S. Rahnamayan**, E. Esmailzadeh, "Vibration Analysis and Multi-Objective Optimization of Stiffened Triangular Plate," *ASME 2014 International Design and Engineering Technical Conferences*, Buffalo, USA, Aug. 17-20, 2014 [accepted].

C54. R. Rizvi, S. Kalra, C. Gosalia, **S. Rahnamayan**, "Fuzzy Adaptive Cruise Control System with Speed Sign Detection Capability," *IEEE International Conference on Fuzzy Systems (FUZZ)*, Beijing, China, July 6-11, 2014, pp. 968-976.

C53. H. Salehinejad, **S. Rahnamayan**, H.R. Tizhoosh, "Type-II Opposition-Based Differential Evolution," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 1768-1775.

C52. H. Liu, Z. Wu, H. Wang, **S. Rahnamayan**, C. Deng, "Improved Differential Evolution with Adaptive Opposition Strategy," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 1776-1783.

C51. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "MODEL: Multi-Objective Differential Evolution with Leadership Enhancement," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 1131-1138.

C50. H. Salehinejad, **S. Rahnamayan**, H.R. Tizhoosh, S.Y. Chen, "Micro-Differential Evolution with Vectorized Random Mutation Factor," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 2055-2062.

C49. A. Ibrahim, **S. Rahnamayan**, M. V. Martin, "MDE: Differential Evolution with Merit-based Mutation Strategy," *2014 IEEE Symposium Series on Computational Intelligence*, Orlando, Florida, December 9-12, 2014, pp. 41-48.

C48. S. Mahdavi, M. E. Shiri, **S. Rahnamayan**, "Co-operative Co-evolution with A New Decomposition Method for Large-Scale Optimization," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 1285-1292.

C47. **S. Rahnamayan**, J. Jesuthasan, F. Bourennani, H. Salehinejad, G. F. Naterer, "Computing Opposition By Involving Entire Population," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 1800-1807.

C46. D. Smullen, J. Gillett, J. Heron, **S. Rahnamayan**, "Genetic Algorithm with Self-Adaptive Mutation Controlled by Chromosome Similarity," *IEEE Congress on Evolutionary Computation (CEC)*, Beijing, China, July 6-11, 2014, pp. 504-511.

C45. A. Ibrahim, **S. Rahnamayan**, M. V. Martin, "Simulated Raindrop Algorithm for Global Optimization," *Canadian Conference on Electrical and Computer Engineering*, Toronto, Canada, May 5-8, 2014, pp. 1-8.

C44. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "Leaders and Speed Constraint Multi-objective Particle Swarm Optimization," *IEEE Congress on Evolutionary Computation (CEC)*, Cancun, Mexico, June 20-23, 2013, pp. 908-915.

C43. H. Wang, Z. Wu, X. Zhou, **S. Rahnamayan**,"Artificial Bee Colony Algorithm with External Archive," *IEEE Congress on Evolutionary Computation*, Cancun,

Mexico, June 20-23, 2013, pp. 517-521.

C42. A. Darvish, **S. Rahnamayan**, Z. Salami Mohamad, "Interactive Differential Evolution for Prostate Ultrasound Image Thresholding," *Genetic and Evolutionary Computation Conference (GECCO, ACM)*, July 7-11, 2012, Philadelphia, USA, pp. 501-508.

C41. A. Esmailzadeh, **S. Rahnamayan**, "Center-Point-Based Simulated Annealing," *Canadian Conference on Electrical and Computer Engineering (CCECE, IEEE)*, April 29 - May 2, 2012, Montreal, Quebec, Canada, pp. 1-4.

C40. S.-M. Mousavi, S. E. Hoque, **S. Rahnamayan**, I. Dincer, G.F. Naterer, "Optimal Design of Air-Cooling System for Li-Ion Battery in an Electric Vehicle Using Genetic Algorithm," *IEEE Congress on Evolutionary Computation (CEC)*, June 5-8, 2011, New Orleans, USA, pp. 1848 - 1855.

C39. F.S. Al-Qunaieer, H.R. Tizhoosh, **S. Rahnamayan**, "Multi-resolution Level Set Image Segmentation Using Wavelet," *IEEE International Conference on Image Processing (ICIP),* Sept. 11-14, 2011, Brussels, Belgium, pp. 269 - 272.

C38. A. Esmailzadeh, **S. Rahnamayan**, "Enhanced Differential Evolution using center-based sampling," *IEEE Congress on Evolutionary Computation (CEC)*, June 5-8, 2011, New Orleans, USA, pp. 2641 - 2648.

C37. A. Esmailzadeh, **S. Rahnamayan**, "Opposition-Based Differential Evolution with Protective Generation Jumping," *Symposium Series on Computational Intelligence (SSCI)*, April 11-15, 2011, Paris, France, pp. 1-8.

C36. Z. Salami Mohamad, A. Darvish, **S. Rahnamayan**, "Eye Illusion Enhancement Using Interactive Differential Evolution," *IEEE Symposium Series on Computational Intelligence (SSCI)*, April 11-15, 2011, Paris, France, pp. 1-7.

C35. H. Wang, **S. Rahnamayan**, Z. Wu, "Adaptive Differential Evolution with Variable Population Size for Solving Large-Scale Problems," *IEEE Congress on Evolutionary Computation (CEC)*, June 5-8, 2011, New Orleans, USA, pp. 2626 - 2632.

C34. H. Wang, Z. Wu, **S. Rahnamayan**, J. Wang, "Diversity Analysis of Opposition-Based Differential Evolution - An Experimental Study," *5th International Symposium on Intelligence Computation and Applications (ISICA)*, October 22-24, 2010, Wuhan, China. LNCS 6382, pp. 95-102.

C33. F. Bourennani, R. Rizvi, **S. Rahnamayan**, "Optimization of Photo-Voltaic Arrays Using Differential Evolution Algorithm," *10th International Conference on Clean Energy (ICCE)*, September 15-17, 2010, Famagusta, N. Cyprus, ref. 7-20, pp. 1-8.

C32. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "Applications of Multi-Objective Optimization to Energy System Design," *the 10th International Conference on Clean Energy (ICCE)*, September 15-17, 2010, Famagusta, N. Cyprus, ref. 6-05, pp. 1-8.

C31. **S. Rahnamayan**, Zaid S. Mohamad, "Tissue Segmentation in Medical Images Based on Image Processing Chain Optimization," *IEEE International Workshop on Real-Time Measurement, Instrumentation and Control (RTMIC)*, June 25-26, 2010, Oshawa, Canada, pp. 9.1-9.9.

C30. A. Esmailzadeh, **S. Rahnamayan**, "Fighting Noise with Noise: DE with Individuals Shaking to Tackle Noisy Problems," *IEEE World Congress on Computational*

Intelligence (WCCI), July 18-23, 2010, Barcelona, Spain, pp. 2514-2522.

C29. F.S. Al-Qunaieer, H.R. Tizhoosh, **S. Rahnamayan**, "Opposition Based Computing - A Survey," *IEEE International Joint Conference on Neural Networks (IJCNN)*, July 18-23, 2010, Barcelona, Spain, pp. 3183-3189.

C28. H. Wang, Z. Wu, **S. Rahnamayan**, and D. Jiang, "Sequential DE Enhanced by Neighborhood Search for Large Scale Global Optimization," *IEEE Congress on Evolutionary Computation, Special Session: Large Scale Global Optimization (CEC)*, July 18-23, 2010, Barcelona, Spain, pp. 4056-4062.

C27. F.S. Al-Qunaieer, H.R. Tizhoosh, **S. Rahnamayan**, "Oppositional Fuzzy Image Thresholding," *IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, July 18-23, 2010, Barcelona, Spain, pp. 2513-2519.

C26. F. Bourennani, **S. Rahnamayan**, G. F. Naterer, "Methods of Optimization Based Design and Controls for Renewable Energy Systems," *10th International Conference on Clean Energy (ICCE)*, September 15-17, 2010, Famagusta, N. Cyprus, ref. 7-08, pp. 1-8.

C25. Kazemi, G.G. Wang, **S. Rahnamayan**, Kamal Gupta, "Constraint Importance Mode Pursuing Sampling for Continuous Global Optimization," *ASME Design Automation Conference (DAC)*, August 15-18, 2010, Montreal, Quebec, Canada, pp. 1-10.

C24. H. Wang, Z. Wu, **S. Rahnamayan**, "Differential Evolution Enhanced by Neighborhood Search," *IEEE World Congress on Computational Intelligence (WCCI)*, July 18-23, 2010, Barcelona, Spain, pp. 1-8.

C23. **S. Rahnamayan**, "Towards Specialized Engineering Majors Based on Distributed e-Learning," *Canadian Engineering Education Association's First Annual Conference (CEEA)*, June 7-9, 2010, Queens University - Kingston, Ontario, Canada.

C22. **S. Rahnamayan**, "Quizzes or Exams, Which one Should be More Challenging?" *Canadian Engineering Education Association's First Annual Conference (CEEA)*, June 7-9, 2010, Queens University - Kingston, Ontario, Canada.

C21. H. Wang, Z. Wu, **S. Rahnamayan**, and L. Kang, "A Scalability Test for Accelerated DE Using Generalized Opposition-Based Learning," *9th International Conference on Intelligent Systems Design and Applications (ISDA-2009)*, Pisa, Italy, Nov. 2009, pp. 1090 - 1095.

C20. **S. Rahnamayan**, G.G. Wang, "Center-Based Sampling for Population-Based Algorithms," *IEEE Congress on Evolutionary Computation (CEC-2009)*, Trondheim, Norway, 18-21 May, 2009, pp. 933 - 938.

C19. **S. Rahnamayan**, G.G. Wang, " Center-Based Initialization for Large-Scale Black-Box Problems," *8th International Conference on Artificial Intelligence, Knowledge Engineering, and Data Bases (AIKED-2009)*, Cambridge, UK, 21-23 Feb., 2009, pp. 531-541.

C18. **S. Rahnamayan**, G.G. Wang, "Investigating in Scalability of Opposition-Based Differential Evolution," *8th International Conference on Simulation, Modeling and Optimization (SMO-2008)*, Santander, Cantabria, Spain, September 23-25, 2008, pp. 105-111.

C17. **S. Rahnamayan**, H.R. Tizhoosh, "Image Thresholding Using Micro Opposition-Based Differential Evolution (Micro-ODE)," *IEEE World Congress on Computational Intelligence (WCCI-2008)*, Hong Kong, June 2008, pp. 1409-1416.

C16. **S. Rahnamayan** and Paul Dieras, "Efficiency Competition on N-Queen Problem: DE vs. CMA-ES," *IEEE Canadian Conference on Electrical and Computer Engineering (CCECE-2008)*, Niagara Falls, Canada, May 2008, pp. 33-36.

C15. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Quasi-Oppositional Differential Evolution," *IEEE Congress on Evolutionary Computation (CEC-2007)*, Singapore, Sep. 2007, pp. 2229-2236.

C14. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Opposition-Based Differential Evolution (ODE) With Variable Jumping Rate," *IEEE Symposium on Foundations of Computational Intelligence*, Honolulu, Hawaii, USA, April 2007, pp. 81-88.

C13. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A. Salama, "Weighted Voting-Based Robust Image Thresholding," *13th IEEE International Conference on Image Processing (ICIP-2006)*, Atlanta, GA, USA, Oct. 2006, pp. 1129-1132.

C12. **S. Rahnamayan**, "A New Initialization Scheme for Evolutionary Optimization Methods," *10th World Multi Conference on Systemics, Cybernetics and Informatics (WMSCI-2006)*, Orlando, USA, July 2006.

C11. N.N. Kachouie, P. Fieguth, **S. Rahnamayan**, "An Elliptical Level Set Method for Automatic TRUS Prostate Image Segmentation," *6th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT-2006)*, Vancouver, Canada, Aug. 2006, pp. 191-196.

C10. E. Jonasson and **S. Rahnamayan**, "Differential Evolution with Fittest Individual Local Tuning," *10th World Multi Conference on Systemics, Cybernetics and Informatics (WMSCI-2006)*, Orlando, USA, July 2006.

C9. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Opposite of Random Number Instead of Second Random Number," *Abstract in 6th Annual MOPTA Conference, Modeling and Optimization: Theory and Applications*, University of Waterloo, Waterloo, Canada, July 2006 (abstract).

C8. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Opposition-Based Evolutionary Algorithms," *Abstract in 6th Annual MOPTA Conference, Modeling and Optimization: Theory and Applications*, University of Waterloo, Waterloo, Canada, July 2006 (abstract).

C7. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A. Salama, "Image Thresholding Using Differential Evolution," *International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV-2006)*, Las Vegas, USA, June 2006, pp. 244-249.

C6. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A. Salama, "Opposition-Based Differential Evolution Algorithms," *IEEE Congress on Evolutionary Computation (CEC-2006)*, Vancouver, July 2006, pp. 2010-2017.

C5. **S. Rahnamayan**, H.R. Tizhoosh, M.M. A. Salama, "Opposition-Based Differential Evolution for Optimization of Noisy Problems," *IEEE Congress on Evolutionary Computation (CEC-2006)*, Vancouver, July 2006, pp. 1865-1872.

C4. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Recognition of Subjective Objects Based on One Gold Sample," *5th WSEAS International Conference on Signal, Speech and Image Processing*, Corfu, Greece, Aug. 2005, pp. 309-314.

C3. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Optimization of Object Extraction Based on One User-Prepared Sample," *Abstract in 5th Annual MOPTA*

Conference, Modeling and Optimization: Theory and Applications, University of Windsor, Windsor, Canada, July 2005 (abstract).

C2. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, "Robust Object Segmentation Using Genetic Optimization of Morphological Processing Chains," *5th WSEAS International Conference on Signal, Speech and Image Processing*, Corfu, Greece, Aug. 2005, pp. 248-253.

C1. **S. Rahnamayan**, H.R. Tizhoosh, M. Salama, "Learning Image Filtering from a Gold Sample Based on Genetic Optimization of Morphological Procedure," *7th International Conference on Adaptive and Natural Computing Algorithms (ICANNGA-2005)*, SpringerComputerScience, Coimbra, Portugal, March 2005, pp. 478-481.

Books

B2. **S. Rahnamayan**, A. Nikgoo, *Dictionary of Multimedia*, Dibagaran Publication, Tehran, Iran, ISBN: 964-6761-88-7, 1999 [translation].

B1. **S. Rahnamayan**, *Optic Physics Lab Software: Concepts and Applications*, Dibagaran Publication, Tehran, Iran, ISBN: 964-5613-33-7, 1997.

Book Chapters

BC8. S. Mahdavi, **S. Rahnamayan**, M. E. Shiri, *Toward Optimal Mapping Scheme in Largescale Optimization by Considering Interaction among Variables and Imbalance Effects of Variables on the Objective Function* [accepted to be published by Springer in Big Data and Optimization book].

BC7. M. Malik, M. Al Ali, I. Dincer, **S. Rahnamayan**, *Exergetic Optimization of Two Renewable Energy Based Tri-generation Systems Using Genetic Algorithm*, Springer-Verlag, April 2014, pp. 79-102.

BC6. F. Bourennani, **S. Rahnamayan**, *Heterogeneous Text and Numerical Data Mining with Possible Applications in Business and Financial Sectors*, Semantic Technologies for Business and Information Systems Engineering: Concepts and Applications, IGI Global Publisher, pp. 60-80, 2012.

BC5. M. Ventresca, **S. Rahnamayan**, H.R. Tizhoosh, *The Use of Opposition for Decreasing Function Evaluations in Population-based Search*, Computational Intelligence in Expensive Optimization Problems, Springer-Verlag, pp. 49-71, 2009.

BC4. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, *Opposition-Based Differential Evolution,* Advances in Differential Evolution, Series: Studies in Computational Intelligence, Springer-Verlag, ISBN: 978-3-540-68827-3, pp. 155-171, 2008.

BC3. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, *Differential Evolution via Exploiting Opposite Populations,* Oppositional Concepts in Computational Intelligence, Series: Studies in Computational Intelligence, Springer-Verlag, ISBN: 978-3-540-70826-1, pp. 143-160, 2008.

BC2. H.R. Tizhoosh, M. Ventresca, **S. Rahnamayan**, *Opposition-Based Computing,* Oppositional Concepts in Computational Intelligence, Series: Studies in Computational Intelligence, Springer-Verlag, ISBN: 978-3-540-70826-1, pp. 11-28, 2008.

BC1. **S. Rahnamayan**, H.R. Tizhoosh, M.M.A Salama, *Automated Snake Initialization for the Segmentation of the Prostate in Ultrasound Images,* Springer Lecture Notes

in Computer Science Series, ISSN: 0302-9743, pp. 930-937, 2005.

Theses

T3. **S. Rahnamayan**, Opposition-Based Differential Evolution, Ph.D. Thesis, Department of Systems Design Engineering, University of Waterloo, Waterloo, Ontario, Canada, May 2007.

T2. **S. Rahnamayan**, Proposing Optimal Load Balancing for Distributed High-load Web-Servers, M.A.Sc. Thesis (with honors), Department of Electrical and Computer Engineering, Shaheed Beheshti University, Tehran, Iran, Aug. 2001.

T1. **S. Rahnamayan**, Proposing and Implementing of an Intelligent Chess Program, B.Sc. Fourth-year Project (with honors), Department of Electrical and Computer Engineering, Shaheed Beheshti University, Tehran, Iran, Sep. 1998.

RESEARCH GRANTS

G9. **NSERC Discovery Grant**
- *Purpose:* Research, Travel, and Publications
- *Name of agency:* Natural Sciences and Engineering Research Council of Canada (NSERC)
- *Date of awarded:* April, 2015
- *Duration:* Five years (2015-2020)
- *Title of project or award:* Efficient Evolutionary Algorithms for Many-objective Optimization
- *Total amount of award:* $\$140,000$
- *All investigators:* Shahryar Rahnamayan (PI)

G8. **NSERC's Supplement to the Discovery Grants for Early Career Researchers**
- *Purpose:* Research, Travel, and Publications
- *Name of agency:* Natural Sciences and Engineering Research Council of Canada (NSERC)
- *Date of awarded:* 2011-2015
- *Duration:* four years
- *Title of project or award:* Opposition-Based Evolutionary Algorithms: Towards Solving High-Dimensional Optimization Problems Efficiently
- *Total amount of award:* $\$20,000$
- *All investigators:* Shahryar Rahnamayan (PI)

G7. **Dean's research Fund-2**
- *Purpose:* Research and Publications
- *Name of agency:* Dean of Engineering, Architecture, and Science, Ryerson University
- *Date of awarded:* Aug. 2011
- *Duration:* One year
- *Title of project or award:* An Image-guided Robotic System for High Intensity Focused Ultrasound
- *Total amount of award:* $\$10,000$
- *All investigators:* Farrokh J. Sharifi (PI) and Shahryar Rahnamayan

G6. **Applied Research and Commercialization Initiative Fund**
- *Purpose:* Research and Publications
- *Name of agency:* Federal Economic Development Agency for Southern Ontario (FedDev Ontario)
- *Date of awarded:* March 2011
- *Duration:* One year (2011-2012)
- *Title of project or award:* Fast Registration for Atlas-Based MRI Image Segmentation
- *Total amount of award:* $\$130,000$
- *All investigators:* Shahryar Rahnamayan (PI)

G5. **NSERC Discovery Grant**
- *Purpose:* Research, Travel, and Publications
- *Name of agency:* Natural Sciences and Engineering Research Council of Canada (NSERC)
- *Date of awarded:* March 2010
- *Duration:* Five years (2010-2015)
- *Title of project or award:* Opposition-Based Evolutionary Algorithms: Towards Solving High-Dimensional Optimization Problems Efficiently
- *Total amount of award:* $\$100,000$
- *All investigators:* Shahryar Rahnamayan (PI)

G4. **Research Collaboration Contract on Statistical Signal Processing for Non-Destructive Testing for Nuclear Industry**
- *Purpose:* Research, Travel, and Publications
- *Name of agency:* Ontario Power Generation (OPG), University Network of Excellence in Nuclear Engineering (UNENE), NSERC
- *Date of awarded:* 2010
- *Duration:* Three years (2010-2013)
- *Title of project or award:* Statistical Signal Processing for Non-Destructive Testing for Nuclear Industry
- *Total amount of award:* $\$90,000$ from UNENE and $\$180,000$ from NSERC
- *All Investigators:* Shahram Shahbazpanahi (PI) and Shahryar Rahnamayan

G3. **Ontario Commercialization Investment Funds (OCIF)**
- *Purpose:* Research, Equipments, Travel, and Publications
- *Name of agency:* Ontario Ministry of Research and Innovation (MRI)
- *Date of awarded:* Jan. 2009
- *Duration:* Three years (2009-2012)
- *Title of project or award:* An Intelligent Medical Image Segmentation Tool
- *Total amount of award:* $\$750,000$
- *All investigotors:* Hamid R. Tizhoosh (PI), Shahryar Rahnamayan, Farhang Sahba, Maryam Shokri
- *Project Description:* The software, MISASS , is an intelligent medical image segmentation tool that learns and improves its automated ability through clinician training and use. Over a short period of time, interpretation by Segasist approaches the accuracy of its human clinician-operator. Inventors: . MISASS has been introduced in Scientific Assembly and Annual Meeting, Radiological Society of North America (RSNA-2009, 2010, 2011, and 2012). The mentioned software will play a crucial rule in early diagnosis of breast cancer. We hope

to take a remarkable step in Canadian medical imaging (Auto-Contouring of Multiple Regions in Medical Images: Segasist's Fast Multi-Contouring: http://www.youtube.com/watch?v=oOwYfVbyhuk). It is currently in the FDA testing.

G2. **UOIT Start-up Fund**
- *Purpose:* Research, Equipment, Travel, and Publications
- *Name of agency:* UOIT
- *Date of awarded:* Sept. 2008
- *Duration:* Two years and continuing
- *Total amount of award:* $\$40,000$
- *All investigotors:* Shahryar Rahnamayan (PI)

G1. **Innovation Demonstration Fund**
- *Purpose:* Supporting Commercialization of an Intelligent Software for Medical Image Analysis (Start-up Company OMISA Inc.)
- *Name of agency:* Ontario Centres of Excellence (OCE)
- *Date of awarded:* Oct. 2007
- *Duration:* One time
- *Title of project or award:* An Intelligent Software for Medical Image Analysis
- *Total amount of award:* $\$25,000$
- *All investigotors:* Hamid R. Tizhoosh (PI) and Shahryar Rahnamayan

Teaching Experience

- **Assistant/Associate Professor, Sept. 2008 - present**
  Faculty of Engineering and Applied Science, UOIT, Oshawa, Canada, developed and taught courses:
  - SOFE 3720U/CSCI 4610U, Intro. to Artificial Intelligence, two times
  - SOFE 2715U, Data Structures, three times
  - SOFE 3770U/CSCI 3070U, Design and Analysis of Algorithms, two times
  - ENGR 1200U, C++ Programming for Engineers, three times
  - SOFE 2720U, Software Design II, two times
  - ENGR 1025U, Engineering Design, one time.
  - SOFE 4840U, Computer and Software Security, two times
  - SOFE 4900U, Software Engineering Systems Design I, three times
  - SOFE 4901U, Software Engineering Systems Design II, three times
  - ENGR 5010G, Advanced Optimization (Graduate), two times
  - ENGR 5004G, Soft Computing (Graduate), one time
  - ENGR 5003G and 6003G, Coordinating Graduate seminars, one time
- **Teaching Assistant, 2004 - 2007, University of Waterloo, Canada**
  undergraduate courses:
  - SYDE 223, Data Structures and Algorithms, four times
  - SYDE 192, Digital Design, two times
  - SYDE 292, Circuits, Instrumentation and Measurements, one time
  - SYDE 423, Computer Algorithm Design and Analysis, one time

HQP
Supervision

Summary of HQP

♢ PDF: 6
♢ PhD: 9
♢ MASc: 10
♢ Research Associates: 2
♢ Senior Students, Capstone Projects: 30
♢ Undergraduate Summer Research: 13
Total: 70

Postdoctoral Fellows

6. Name: Dr. Amir Gandomi (co-supervision)
   Research topic: Optimization of Highly Complex Structures
   Date: July 2015- present (full-time)
   Institute: ECE, Michigan State University, MI, USA
5. Name: Dr. Qinghong Guo (co-supervision)
   Research topic: Image-Based Controlling of Catheter in Cardiac Surgery
   Date: Nov.-Dec. 2012 (full-time)
   Institute: Ryerson University
4. Name: Dr. Guangyi Chen (co-supervision)
   Research topic: Intra-Cardiac Image Processing Algorithms for Real-Time Tracking and Control in Cardiac Interventions
   Date: Dec. 2012 - Jan. 2013 (full-time)
   Institute: Ryerson University
3. Name: Dr. Aryan Salmanpour (co-supervision)
   Research topic: Registration-Based Volume Segmentation of Prostate Gland
   Date: May 2011 - May 2012 (full-time)
   Institute: UOIT
2. Name: Dr. Khaled Saleh (sole-supervision)
   Research topic: Fingerprint Recognition
   Date: Sept. 2010 - Aug. 2013
   Institute: UOIT
1. Name: Dr. Ahmet Kucukkomurler (sole-supervision)
   Research topic: Smart Sampling Methods to Solve Large-Scale Optimization Problems Efficiently
   Date: Sept.-Dec. 2009 (full-time)
   Institute: UOIT

Doctoral Students

9. Name: Ms. Hanan Hiba
   Thesis topic: Designing Optimal Artificial Neural Netwroks
   Date: Sep. 2015 - present (full-time)
   Institute: UOIT
8. Name: Mr. Khaled Ahsan Talukder (co-supervision)
   Thesis topic: Opposition-based Many-objective Optimization
   Date: Sep. 2014 - present (full-time)
   Institute: ECE, Michigan State University, MI, USA
7. Name: Mr. Robert Zadeh (co-supervision)
   Thesis topic: Sensor Fusion in Autonomous Cars
   Date: Sep. 2013 - present (part-time)
   Institute: UOIT
6. Name: Ms. Sedigeh Mahdavi (co-supervision)
   Thesis topic: Co-evolutionary Co-operative Large-Scale Optimization
   Date: Dec. 2012 - present (full-time)
   Institute: Amirkabir University of Technology
5. Name: Mr. Amin Ibrahim (co-supervision)
   Thesis topic: Merit-based Evolutionary Algorithms to Solve Multi-objective Optimization Problems Efficiently
   Date: Sep. 2012 - present (part-time)
   Institute: UOIT
4. Name: Mr. Saaed Mehdizadeh-Bakshmand (co-supervision)
   Thesis topic: Vision-Based Control of Catheter in Heart Invasive Surgery
   Date: Jan. - Sept. 2012
   Institute: Ryerson University
3. Name: Mr. Farid Bourennani (co-supervision)
   Thesis topic: Leadership-Based Multi-Objective Optimization with Applications in Energy Systems
   Date: Sept. 2009 - Dec. 2013 (graduated)
   Institute: UOIT
2. Name: Mr. Fares S. Al-Qunaieer (co-supervision)
   Thesis topic: Automated Resolution Selection for Image Segmentation
   Date: Sept. 2009 - Jan. 2014 (graduated)
   Institute: University of Waterloo
1. Name: Dr. Hui Wang (unofficial co-supervision)
   Thesis topic: Accelerating of Population-based Algorithms Using Opposition-based Schemes
   Date: Sept. 2008 - May 2011 (graduated, lecturer in School of Information Engineering, Nanchang Institute of Technology, China)
   Institute: Wuhan University, Wuhan, China

Master's Students

10. Name: Mr. Jonathan Gillett (sole-supervision)
    Thesis topic: Utilizing Evolutionary Computation for Convex Pentagons Tiling

Date: Sept. 2014 - present (full-time)
Institute: UOIT

9. Name: Mr. Hassan Rabbani (co-supervision)
Thesis topic: Designing Optimal Hybrid Renewable Energy Systems
Date: May 2014 - present (full-time)
Institute: UOIT

8. Name: Mr. Hojjat Salehinejad (co-supervision)
Thesis topic: Micro-Differential Evolution: Diversity Enhancement and Comparative Study
Date: Sept. 2013 - July 2014 (graduated)
Institute: UOIT

7. Name: Mr. Raazi Rizvi (co-supervision)
Thesis topic: Designing Optimal Hydrophobic Surfaces
Date: Sept. 2013 - present (part-time)
Institute: UOIT

6. Name: Mr. Harris Mushtaq (co-supervision)
Thesis topic: Content-based Image Retrieval
Date: May 2013 - Feb. 2014 (withdrew)
Institute: Systems Design Engineering, University of Waterloo

5. Name: Ms. Zakiya Alfughi (co-supervision)
Thesis topic: Designing Optimal Three-dimensional Photovoltaics
Date: Jan. 2013 - present (full-time)
Institute: UOIT

4. Name: Mr. Shaho ShahbazPanahi (sole-supervision)
Thesis topic: Learning Image Enhancement and Object Localization Using Evolutionary Algorithms
Date: Jan. 2012 - March 2014 (graduated)
Institute: UOIT

3. Name: Mr. Zaid Mohamad (sole-supervision)
Thesis topic: Tissue extraction from medical images based on image processing chain optimization
Date: Jan. 2010 - present (part-time)
Institute: UOIT

2. Name: Mr. Ali Esmailzadeh (sole-supervision)
Thesis topic: Novel Opposition-Based Sampling Methods for Efficiently Solving Challenging Optimization Problems
Date: Sept. 2009 - April 2011 (graduated)
Institute: UOIT

1. Name: Mr. Arman Darvish (sole-supervision)
Thesis topic: User Aid-based Evolutionary Computation for Optimal Parameter Setting of Image Enhancement and Segmentation
Date: Jan. 2010 - Dec. 2011 (graduated)
Institute: UOIT

Research Associate

2. Name: Mr. Shaho ShahbazPanahi (sole-supervision)
   Thesis topic: Industrial Ultrasound Image Enhancement and Segmentation
   Date: May 2011 - Dec. 2011 (full-time)
   Institute: UOIT

1. Name: Dr. Farzad Khalvati (sole-supervision)
   Thesis topic: Prototyping of Breast Ultrasound Image Segmentation
   Date: Nov. 2007 - March. 2008 (part-time)
   Institute: University of Waterloo (now, a scientist researcher in Segasist Technologies)

Undergraduate 4th Year Design Project Supervision at UOIT

11. Names: Wesley Unwin, Mitchel George, Devin Ebersbach (sole-supervision)
    Design Project Topic: Multi-Objective Evolutionary Digital Circuit Design
    Date: Sept. 2013 - April 2014
10. Names: Daniel Smullen, Jonathan Gillett, Joseph Heron (co-supervision)
    Design Project Topic: Camera-Based Automated Highway Monitoring System
    Date: Sept. 2013 - April 2014
9. Names: Mahalia Cardinal, Ila Duta, Kailey Renton, Rebecca Cooper, David Petras (co-supervision)
    Design Project Topic: School Bulling Simulation and Visualization
    Date: Sept. 2013 - April 2014
8. Names: Shivam Kalra, Daksh Grotra, Raazi Rizvi, and Dinero Chirag Gosalia (sole-supervision)
    Design Project Topic: Fuzzy-based Adaptive Cruise Control System with Speed Sign Detection Capability (ranked first in the capstone competition)
    Date: June 2012 - April 2013
7. Names: Adam Waito, Janul Saini, and Ryan Shanks (sole-supervision)
    Design Project Topic: Class Scheduling and Optimization Software for UOIT
    Date: June 2012 - April 2013
6. Names: Uday Kalluri, Fariel Kabir, and Mohit Patel (sole-supervision)
    Design Project Topic: A System for Collecting CVs, Ranking, and Generating Comprehensive Reports (ranked second in the capstone competition)
    Date: Sept. 2011 - April 2012
5. Name: Anthony Fintelman and Shawn Lee-Kwong (sole-supervision)
    Design Project Topic: Sequential Differential Evolution (SDE)
    Date: Sept. 2009 - April 2010
4. Name: John Finnson (sole-supervision)
    Design Project Topic: Accelerating EAs Using Variable Population Size
    Date: Sept. 2009 - April 2010
3. Name: Nisanth Premacumar, Rajiv Senthilnathan, Russell Howse, and Saad Shakil (sole-supervision)
    Design Project Topic: Students's Academic Performance Monitoring System
    Date: Sept. 2009 - April 2010
2. Name: Mr. Erik Jonasson (co-supervision)
    Design Project Topic: Opposition-Based DE With a Variable Jumping Rate
    Date: Jan.-Apr. 2006
    Institute: University of Waterloo
1. Name: Mr. Paul Dieras (co-supervision)
    Design Project Topic: Efficiency Competition on N-Queen Problem, DE vs. CMA-ES
    Date: Jan.-Apr. 2007
    Institute: University of Waterloo

Undergraduate Students, Summer Research

12. Name: Mr. Aditya Sriram
    Project Topic: Earthquake Forecasting Using ANN
    Date: Sep. 2012 - Aug. 2014
11. Name: Mr. Jude Jesuthasan
    Project Topic: Adaptive Centroid Opposition-Based Differential Evolution
    Date: May 2012 - June 2014
10. Name: Mr. Harris Mushtaq (NSERC, USRA)
    Project Topic: Multi-Objective Modeling of Hydrogen Distribution in Ontario
    Date: May - Aug. 2012
9. Name: Mr. Jeremy Tan
    Project Topic: Developing Hepatic Control Component for Robotic Catheter Manipulation System
    Date: June-Aug. 2011
    Institute: Ryerson University
8. Name: Mr. Carlos Arreazo
    Project Topic: Heterogenous Data Classification
    Date: May-Aug. 2011
7. Name: Mr. Harris Mushtaq
    Project Topic: Interactive Evolutionary Computation
    Date: June 2010 - Dec. 2011
6. Name: Mr. Arreb Siddiqi
    Project Topic: Interactive Evolutionary Computation
    Date: May-Aug. 2011
5. Name: Mr. Jude Jesuthasan (NSERC, USRA)
    Project Topic: Centroid Opposition-Based Differential Evolution
    Date: May - Aug. 2011
4. Name: Mr. Srieeranngan Sellvakumar
    Project Topic: Evolutionary Digital Circuite Design
    Date: June 2010 - Mar. 2011
3. Name: Ms. Kanika Gupta
    Project Topic: A Weighted Voting-Based Image Thresholding
    Date: May-Aug 2009
2. Name: Mr. Mario Drago
    Project Topic: Preventing Double Generation Jumping in Opposition-Based DE
    Date: May-Aug 2009
1. Name: Ms. Brittany Kondo (NSERC, USRA)
    Project Topic: Setting Population Size for Evolutionary Algorithms
    Date: May-Aug 2009

PROFESSIONAL SERVICE

Thesis Examiner

20. Name: Ms. Iuliia Chepurna
    Project title: User-Centric Analytics for Expert Crowds
    Degree: MSc
    Role: Internal Examiner
    Date: Sept. 21, 2015
    Institute: UOIT
    Faculty/Department: Electrical, Computer, and Software Engineering
19. Name: Mr. Mahdi Shahbaba
    Project title: Clustering and Order Selection for Arbitrary and Non-arbitrary Shaped Data
    Degree: PhD
    Role: External Examiner
    Date: Aug. 21, 2015
    Institute: Ryerson University
    Faculty/Department: Electrical and Computer Engineering
18. Name: Mr. Fereydoon Diba
    Project title: Development, Optimization and Simulation of Hybrid Electric Heavy Duty Truck with Self-propelled Trailer
    Degree: PhD
    Role: Examiner
    Date: Nov. 28, 2014
    Institute: UOIT
    Faculty/Department: Mechanical Engineering
17. Name: Mr. Kyle Robert Harrison
    Project title: Network Similarity Measures and Automatic Construction of Graph Models Using Genetic Programming
    Degree: M.A.Sc.
    Role: External Examiner
    Date: Aug. 28, 2014
    Institute: Brock University
    Faculty/Department: Computer Science
16. Name: Mr. Reza Vahidnia
    Thesis title: Asynchronous Bi-directional Relay-assisted Communication Networks
    Degree: PhD
    Role: Examiner
    Date: April 29, 2014
    Institute: UOIT
    Faculty/Department: Department of Electrical, Computer, and Software Engineering
15. Name: Jason Huang
    Thesis title: Development and Experimental Investigation of New Self-Can Cool-

ing Systems
Degree: M.Sc.
Role: External Examiner
Date: April 17, 2014
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

14. Name: Janette Hogerwaard
Thesis title: Comparative Study of Ammonia-based Rail Transportation in Great Toronto Area
Degree: M.Sc.
Role: External Examiner
Date: April 17, 2014
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

13. Name: Mr. Tao Sun
Project title: Design Synthesis of Car-Trailer Systems with Active Trailer Differential Braking Strategies
Degree: M.Sc.
Role: Internal Examiner
Date: Aug. 6, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

12. Name: Mr. Fereydoon Diba
Project title: Design, Modeling, and Evaluation of Hybrid Articulated Vehicle with Self-propelled Trailer
Degree: PhD
Role: Candidacy Examiner
Date: June 26, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

11. Name: Mr. Alexander Bailey
Project title: Automatic Inference of Graph Models for Complex Networks with Genetic Programming
Degree: M.A.Sc.
Role: External Examiner
Date: May 30, 2013
Institute: Brock University
Faculty/Department: Computer Science

10. Name: Mr. Javad Mirzaee
Project title: Sum-Rate Maximization For Active Channels
Degree: M.A.Sc.
Role: Internal Examiner
Date: April 10, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

9. Name: Mr. Steven Tebby
Project title: Optimal Vehicle Structural Design for Weight Reduction using It-

erative Finite Element Analysis
Degree: M.A.Sc.
Role: Internal Examiner
Date: Dec. 17, 2012
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

8. Name: Mr. David Kelk
Project title: CORE: Concurrent Repair
Degree: PhD
Role: External Examiner (Candidacy Exam)
Date: Jan. 31, 2013
Institute: UOIT
Faculty/Department: Computer Science

7. Name: Mr. Reza Vahidnia
Project title: Power Allocation and beamforming for OFDM-Based Two-Way Relay Networks
Degree: PhD
Role: Examiner (Candidacy Exam)
Date: Nov. 12, 2012
Institute: UOIT
Faculty/Department: Department of Electrical, Computer, and Software Engineering

6. Name: Mr. Achint Rastogi
Project title: Practical Implementation of a Risk Based Safety Verification Framework for Nuclear Power Plants
Degree: M.Eng.
Role: Reader
Date: Nov. 25, 2011
Institute: UOIT
Faculty/Department: Faculty of Energy Systems and Nuclear Science

5. Name: Mr. Abdulelah Alganas
Thesis title: Social-Based Trustworthy Forwarding Vehicular Delay Tolerant Networks
Degree: M.Sc.
Role: Internal Examiner
Date: April 8, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

4. Name: Mr. Khalid Alfaheid
Thesis title: A Secure and Compromise-Resilent Architecture for Advanced Metering Infrastructure
Degree: M.Sc.
Role: Internal Examiner
Date: April 8, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

3. Name: Mr. Muhammad Ali Raffay

Thesis title: Data Hiding and Detection in Office Open XML (OOXML) Documents
Degree: M.Sc.
Role: Internal Examiner
Date: April 8, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

2. Name: Mr. Tanaby Zibamanzar-Mofrad
Thesis title: Comparison of Classification Ability of Hyperball Algorithms to Neural Network and Nearest Neighbor Algorithms
Degree: M.Sc.
Role: External Examiner
Date: Dec. 3, 2010
Institute: Brock University
Faculty/Department: Faculty of Mathematics and Computer Science

1. Name: Mr. Haris Chowdhry
Thesis title: Fast Model Predictive Control of Wheeled Mobile Robots
Degree: M.Sc.
Role: Internal Examiner
Date: Dec. 2, 2010
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

Thesis Defence Chair

11. Name: Mr. Rob Roberts
Thesis title: Spectroscopic Analysis Under Various Light Conditions and the Impact on Photocatalytic Hydrogen Production
Degree: M.Sc.
Date: Sept. 18, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

10. Name: Mr. Hassan Ozcan
Thesis title: Experimental and Theoretical Investigations of Magnesium-Chlorine Cycle and its Integrated Systems
Degree: PhD Candidacy
Date: Aug. 22, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

9. Name: Mr. Anwar Hassoun
Thesis title: Development, Analysis and Performance Assessment of Net Zero Energy House Systems
Degree: PhD Candidacy
Date: Aug. 22, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

8. Name: Mr. Rafay Shamim

Thesis title: Experimental and Theoretical Investigations of a New Integrated Solar Tower for Photovoltaic Hydrogen and Power Production
Degree: M.Sc.
Date: Aug. 20, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

7. Name: Mr. Seyedali Aghahosseini
Thesis title: System Integration and Optimization of Copper-Chlorine Thermochemical Cycle with Various Options for Hydrogen Production
Degree: PhD Defence
Date: Aug. 19, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

6. Name: Mr. Sajid Hussain
Thesis title: Intelligent Fault Diagnosis of Gearboxes and its Applications on Wind Turbines
Degree: PhD
Date: April 3, 2013
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

5. Name: Mr. Paolo Cuda
Thesis title: Exergoeconomic Analysis and Optimization of Organic Rankine Cycles
Degree: M.Sc.
Date: April 16, 2012
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

4. Name: Ms. Min Pan
Thesis title: Three-degree of Freedom Hip Exoskeleton Based on Biomimetic Parallel Structure
Degree: M.Sc.
Date: Aug. 16, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

3. Name: Ms. Chinwe M. Nwaekwe
Thesis title: Channel Estimation in a Two-Way Relay Network
Degree: M.Sc.
Date: Aug. 10, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

2. Name: Mr. Musharaf Rabbani
Thesis title: Analysis and Processing Issues of Plastic Color Mismatch
Degree: M.Sc.
Date: March 29, 2011
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

1. Name: Ms. Kimia Kazemi

Thesis title: Integration of Component Based Frameworks with Sensor Web Languages
Degree: M.Sc.
Date: Aug. 5, 2010
Institute: UOIT
Faculty/Department: Faculty of Engineering and Applied Science

Research Grant Reviewer

- BEACON Grant (three applications), Michigan State University, USA, April 2015.
- NSERC Idea to Innovation Grant, April 2013.
- NSERC Idea to Innovation Grant, April 2012.
- NSERC Discovery Grant, Dec. 2011.
- MITACS Accelerate Research, Oct. 2011.
- NSERC Idea to Innovation Grant, Feb. 2011.
- NSERC Strategic Grant, Aug. 2010.

Journal Paper/Book Reviewer

- IEEE Transactions on Evolutionary Computation
- IEEE Transactions on Systems, Man, and Cybernetics
- IEEE Transactions on Neural Networks and Learning Systems
- Elsevier Journal on Applied Soft Computing
- Elsevier Journal of Information Sciences
- Elsevier Engineering Applications of Artificial Intelligence
- Optics and Laser Technology
- Journal of Computational Methods in Sciences and Engineering
- International Journal of Exergy
- IEEE Transactions on Cybernetics
- Algorithms
- Lasers in Engineering
- Elsevier Pattern Recognition Letters
- Elsevier Journal of Neurocomputing
- Natural Computing
- Lasers in Engineering
- Arabian Journal for Science and Engineering
- Mathematical Problems in Engineering
- Computational Optimization and Applications
- Journal of Computers in Biology and Medicine
- Journal of Intelligent and Fuzzy Systems
- Canadian Journal of Electrical and Computer Engineering
- Elsevier - Communications in Nonlinear Science and Numerical Simulation
- International Journal of Control, Automation, and Systems Secretariat

- IEEE Computational Intelligence Magazine
- Evolutionary Intelligence
- Elsevier Journal of Computers and Mathematics with Applications
- IET Generation, Transmission and Distribution
- Elsevier Journal of Computers and Mathematics with Applications
- ACM Transactions on Autonomous and Adaptive Systems
- International Journal of Engineering Optimization
- Elsevier Journal of Artificial Intelligence in Medicine
- ACM Transactions on Autonomous and Adaptive Systems
- International Journal of Systems Science
- International Journal of Intelligent Information and Database Systems
- Transactions of CSME (Canadian Society for Mechanical Engineering)
- Elsevier Journal of Information Sciences
- International Journal of Metaheuristics
- Journal of Applied Computational Intelligence and Soft Computing
- Journal of Advances in Engineering Software
- Springer-Verlag Journal of Neural Computing and Applications
- Elsevier Journal of Information Processing Letters
- Journal of Intelligent and Fuzzy Systems
- Journal of Information Science and Engineering
- Journal of Electrical and Computer Engineering
- John Wiley & Sons (book chapter)

Faculty's Committee Membership

- Faculty Tenure Committee, 2014
- Faculty Software Engineering Program Review Committee, 2013-2014
- Faculty Strategic Planning Committee, 2012
- Academic Integrity Committee, 2012
- Graduate Committee, 2009 - 2013
- Search Committee to hire core faculty members in Software Engineering, 2010 and 2011.
- Search Committee to hire several sessional teaching instructors, 2010 and 2011.
- Curriculum Committee, July 2009 - Oct. 2010.

Conference Paper Reviewer

- IEEE Congress on Evolutionary Computation, Senda, Japan, 2015.
- IEEE Symposium Series on Computational Intelligence (SSCI), Orlando, Florida, USA, 2014.
- IEEE Congress on Evolutionary Computation, Beijing, China, 2014.
- IEEE Congress on Evolutionary Computation, Cancun, Mexico, 2013.
- IEEE Symposium Series on Computational Intelligence (SSCI), Singapore, 2013.
- Canadian Conference on Electrical and Computer Engineering (IEEE, CCECE), Montreal, Quebec, Canada, 2012.
- IEEE Congress on Evolutionary Computation (CEC-12), Brisbane, Australia, 2012.
- 11th International Conference on Artificial Intelligence and Soft Computing ICAISC, Zakopane, Poland, 2011.
- IEEE International Workshop on Systems, Signal Processing and their Applications (WoSPA), Tipaza, Algeria, 2011.
- IEEE Congress on Evolutionary Computation (CEC-11), New Orleans, USA, 2011.
- Symposium on Memetic Computing (MC), a part of IEEE Symposium Series on Computational Intelligence (SSCI), Paris, France, 2011.
- Symposium on Differential Evolution (SDE), a part of IEEE Symposium Series on Computational Intelligence (SSCI), Paris, France, 2011.
- International Conference on Mechanical Engineering and Information Technology (MEIT), Taiyuan, Shanxi, China, 2011.
- International Symposium on Optomechatronic Technologies (ISOT), Toronto, Ontario, Canada, 2010.
- International Conference on Swarm, Evolutionary and Memetic Computing, Chennai, India, 2010.
- International Conference on Image Analysis and Signal Processing (IASP), Xiamen, Fujian, China, 2010.
- IEEE Congress on Evolutionary Computation (CEC), Barcelona, Spain, 2010.
- International Symposium on Optomechatronic Technologies (ISOT), Turkey, 2009.
- The International Conference on Intelligent Systems Design and Applications (ISDA), Italy, 2009.
- International Conference on Evolutionary Computation (ICEC), Portugal, 2009.
- IEEE Congress on Evolutionary Computation (CEC), Trondheim, Norway, 2009.
- IEEE Symposium on Computational Intelligence for Image Processing (CIIP), Nashville, TN, USA, 2009.
- The 6th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA), Pattern Recognition and Image Processing Track, Doha, Qatar, 2008.
- International Conference on Image Analysis and Recognition (ICIAR), published in the Springer Lecture Notes in Computer Science (LNCS) series:
  - Niagara Falls, Canada, 2015
  - Vilamoura, Algarve, Portugal, 2014

- Póvoa de Varzim, Portugal, 2013
- Aveiro, Portugal, 2012
- Burnaby, BC, Canada, 2011
- Póvoa de Varzim, Portugal, 2010
- Halifax, Canada, 2009
- Póvoa de Varzim, Portugal, 2008
- Montreal, Canada, 2007
- Póvoa de Varzim, Portugal, 2006
- Toronto, Canada, 2005

Conference Organizing Committee

- **Chair** of Local Organizing Committee, International Symposium on Optomechatronic Technologies (ISOT-2010), Toronto, Ontario, Canada, 2010.
- International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV-2007), Las Vegas, Nevada, USA, 2007.
- International Conference on Genetic and Evolutionary Methods (GEM-2007), Las Vegas, Nevada, USA, 2007.
- International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV-2006), Las Vegas, Nevada, USA, 2006.
- International Conference on Artificial Intelligence (ICAI-2006), Las Vegas, Nevada, USA, 2006.
- 2nd IEEE-UW Workshop on Image Processing (Theory and Application), University of Waterloo, Waterloo, Canada, 2003.

Technical Program Committee

- International Conference on Image Analysis and Recognition (ICIAR), Vilamoura, Algarve, Portugal, 2014.
- The 18th Asia Pacific Symposium of Intelligent and Evolutionary Systems, Singapore, 2014.
- International Conference on Image Analysis and Recognition (ICIAR), Póvoa de Varzim, Portugal, 2013.
- IEEE Congress on Evolutionary Computation, Cancun, Mexico, 2013.
- International Conference on Image Analysis and Recognition (ICIAR), Aveiro, Portugal, 2012.
- International Conference on Swarm, Evolutionary and Memetic Computing Conference (SEMCCO-12) and Fuzzy and Neural Computing Conference (FANCCO-12), Odisha, India, 2012.
- Symposium on Swarm Intelligence and Differential Evolution (SIDE), Zakopane, Poland, 2012.
- International Conference on Advances in Computing, Communications and Informatics (ICACCI-12), Chennai, India, 2012.

- IEEE Congress on Evolutionary Computation (CEC-12), Brisbane, Australia, 2012.
- International Conference on Artificial Intelligence and Soft Computing (ISAISC), Zakopane, Poland, 2012.
- IEEE International Conference on Computational Intelligence and Communication Networks (CICN), Gwalior, India, 2011.
- IEEE International Conference on Communication Systems and Network Technologies (CSNT), Bhopal, India, 2011.
- International Conference on Image Analysis and Recognition (ICIAR), Burnaby, BC, Canada, 2011.
- International Conference on Mechanical Engineering and Information Technology (MEIT-2011), Taiyuan, Shanxi, China, 2011.
- IEEE Symposium Series on Computational Intelligence (SSCI), Halle aux Farines, Paris, France, 2011.
- Workshop on Mathematical Morphology, Indian Statistical Institute (ISI), Kolkata, India, 2010.
- International Conference on Image Analysis and Signal Processing (IASP), Xiamen, Fujian, China, 2010.
- International Conference on Image Analysis and Recognition (ICIAR-2010), Póvoa de Varzim, Portugal, 2010.
- International Symposium on Optomechatronic Technologies (ISOT), Turkey, 2009.
- The International Conference on Intelligent Systems Design and Applications (ISDA), Italy, 2009.
- International Conference on Maritime and Naval Science and Engineering (MN), Romania, 2009.
- International Conference on Evolutionary Computation (ICEC), Portugal, 2009.
- WASE Global Congress on Science Engineering (GCSE), Hong Kong, 2009.
- International Conference on Image Analysis and Recognition (ICIAR-09), Halifax, Canada, 2009.
- IEEE Congress on Evolutionary Computation (CEC-09), Trondheim, Norway, 2009.
- IEEE Symposium on Computational Intelligence for Image Processing (CIIP-09), Nashville, TN, USA, 2009.
- The 6th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA-08), Doha, Qatar, 2008.

Judge Acting

- Capstone projects exhibitions, UOIT, Oshawa, Canada, UOIT, April 2014.
- Three Minutes Thesis Competition, UOIT, Oshawa, Canada, UOIT, March 2013.
- Capstone projects exhibitions, UOIT, Oshawa, Canada, UOIT, April 2012.
- 6th and 7th Annual Student Research Showcases, UOIT, Oshawa, Canada, UOIT, Aug. 2009 and 2010.
- **Chief Judge** for 2009 Durham Regional Science Fair (with 14 judges), Winter 2009.

PRESENTATIONS

Tutorials

- Opposition-Based Soft Computing, IEEE Congress on Evolutionary Computation, Cancun, Mexico, June 20, 2013.

Invited Speaker

- Color Separation in Forensic Image Processing Using Interactive Differential Evolution, The American Society of Questioned Document Examiners Inc., Toronto, Canada, Aug. 10, 2015
- Large-scale Visualization Tool for Interactive Optimization and Learning (LVIOL), Visual Collaboration Technologies Inc., Troy, USA, Jan. 29, 2015
- Opposition-based Soft Computing, BEACON Research Center, Michigan State University, USA, Jan. 23, 2015.
- Research in Optimization and Optimization in Research, School of Engineering Science, Simon Fraser University, July 16, 2014.
- Opposition-Based Soft Computing, King Fahd University of Petroleum and Minerals, Feb. 2014.
- Artificial Intelligence: Methods and Applications, King Fahd University of Petroleum and Minerals, Feb. 2014.
- Opposition-Based Soft Computing, Serial talks: Tubitak Marmara Research Center, Yildiz Technical University, Istanbul University, Turkey, July 11-18, 2013.
- Opposition-Based Computation: Concepts and Applications, Sixth International Exergy, Energy and Environment Symposium, Rize, Turkey, July 1-4, 2013.
- Oppositional Computation, Department of Computer Science, Tabriz University, May 28, 2012.
- Opposition-Based Evolutionary Computation, School of Engineering Science, Simon Fraser University, June 28, 2011.
- Towards Opposition and Center-Based Sampling for High-Dimensional Search Spaces, 8th WSEAS International Conference on Artificial Intelligence, Knowledge Engineering, and Data Bases, University of Cambridge, Cambridge, UK, Feb. 2009.
- Opposition-Based Computation, 8th WSEAS International Conference on Simulation, Modeling and Optimization, Spain, Sep. 2008.

University Presentations

- Opposition-based Soft Computing, Electrical and Computer Engineering Department, Michigan State University, Sept. 25, 2014.
- Differential Evolution and Particle Swarm Optimization Algorithms, Electrical and Computer Engineering Department, Michigan State University, Sept. 23, 2014.
- Scientific Large-scale Data Visualization Techniques, Electrical and Computer Engineering Department, Michigan State University, Sept. 22, 2014.

- Opposition-based Evolutionary Algorithms: Part II, Electrical and Computer Engineering Department, Michigan State University, Sept. 8, 2014.
- Opposition-based Evolutionary Algorithms: Part I, Electrical and Computer Engineering Department, Michigan State University, Aug. 25, 2014.
- Solving Real-World Complex Problems by Evolutionary Computation, Campus Connections Day, UOIT, April 2009.
- Tackling Expensive Black-Box Optimization Problems, Product Design and Optimization Laboratory, Simon Fraser University, April 2008.
- Opposition-Based Differential Evolution Algorithm, MIAMI Research Group, University of Waterloo, Feb. 2006.
- Image Thresholding Using Genetic Algorithms, MIAMI Research Group, University of Waterloo, July 2005.
- Eliminating User Interaction for Snake Initiation for the Segmentation of the Prostate in Ultrasound Images, UW-MIAMI Workshop on Biomedical Engineering, University of Waterloo, March 2005.
- Weighted Voting-Based Image Thresholding, Graduate Student Research Talks, University of Waterloo, Nov. 2005.
- Automatic Acquisition of Image Filtering and Object Extraction Procedures from User-Prepared Samples, Department Seminar, University of Waterloo, Oct. 2005.
- Weighted Voting-Based Image Thresholding, MIAMI Research Group, University of Waterloo, Oct. 2005.
- Learning Image Processing Tasks from a few Number of User-Manipulated Images, University of Waterloo, Nov. 2004.
- Learning Image Processing Tasks from a Small Number of User-Manipulated Images, MIAMI Research Group, University of Waterloo, Oct. 2004.
- Morphological Image Processing, University of Waterloo, Nov. 2003.
- Image Quality Measures (IQM), University of Waterloo, Oct. 2003.

Poster Presentations

- Areeb Siddiqi, Harris Mushtaq, **S. Rahnamayan**, "Colour Separation in Forensic Image Processing Using Interactive Differential Evolution," Annual Student Research Showcase, UOIT, Oshawa, Canada, Aug. 2011.
- Jude A.S. Jesuthasan, **S. Rahnamayan**, Farid Bourennani "Centroid-Opposition Based Differential Evolution," Annual Student Research Showcase, UOIT, Oshawa, Canada, Aug. 2011.
- K. Gupta, **S. Rahnamayan**, "Proposing a New Image Thresholding Approach Using Algorithms Fusion," Annual Student Research Showcase, UOIT, Oshawa, Canada, Aug. 2009 [**Winner of the best poster award from Engineering Faculty**].
- M. Drago, **S. Rahnamayan**, "Accelerating Opposition-Based Differential Evolution (ODE) by Preventing Double Generation Jumping," 6th Annual Student Research Showcase, UOIT, Oshawa, Canada, Aug. 2009.
- B. Kondo, **S. Rahnamayan**, "Setting Population Size for Evolutionary Algorithms to Tackle Large-Scale Problems," 6th Annual Student Research Showcase, UOIT, Oshawa, Canada, Aug. 2009.

- **S. Rahnamayan**, H.R. Tizhoosh, F. Sahba, M. Shokri, "Modality-Independent, Self-Adaptive Segmentation System (MISASS)," Smart Start Contest, University of Waterloo, Waterloo, Canada, Oct. 2007.
- **S. Rahnamayan**, H.R. Tizhoosh, M. Salama, "Automated Snake Initialization for the Segmentation of the Prostate in Ultrasound Images," CIHR Strategic Training Program in Vascular Research, University of Western Ontario, March 2004.
- **S. Rahnamayan**, "Image Quality Measures (IQM)," 2nd IEEE-UW Workshop on Image Processing (Theory and Application), University of Waterloo, Waterloo, Canada, 2003.

PROFESSIONAL/ RESEARCH AFFILIATIONS

- Member, Professional Engineers of Ontario (PEng)
- Senior Member, Institute of Electrical and Electronics Engineers, Computational Intelligence Society, and Industrial Electronic Society (SMIEEE)
- Professional Member, Association for Computing Machinery and Genetic and Evolutionary Computation Society
- Expert Member, Mitacs College of Reviewers
- Member, American Society for Engineering Education (ASEE)
- Member, Canadian Engineering Education Association (CEEA)
- Member, Robotics and Manufacturing Automation Laboratory, Ryerson University
- Member, Pattern Analysis and Machine Intelligence Research Group, University of Waterloo, Canada

ACADEMIC REFERENCES

◇ **Dr. Hamid R. Tizhoosh, Professor**
University of Waterloo
Department of Systems Design Engineering
200 University Avenue West, Waterloo
Ontario, N2L 3G1, Canada
Phone: 1-(519)-888-4567 extension 36751
Fax: 1-(519)-746-4791
Home page: http://pami.uwaterloo.ca/tizhoosh
E-mail: tizhoosh@uwaterloo.ca

◇ **Dr. Kalyanmoy Deb, Professor, FASME, Koenig Endowed Chair Professor**
Michigan State University
428 S. Shaw Lane, 2120 Engineering Building, East Lansing, MI 48864, USA
Phone: 1-(517)-432-2144
Fax: 1-(517)-353-1980
Home page: http://www.egr.msu.edu/~kdeb/
E-mail: kdeb@egr.msu.edu

◇ **Dr. Greg F. Naterer, Professor and Dean, P.Eng., FCSME, FASME, FEIC**
Memorial University of Newfoundland
Dean of Faculty of Engineering and Applied Science
St. John's, NL A1B 3X5, Canada
Phone: 1-(709)-864-8810
Fax: 1-(709)-864-8975
Home page: http://www.engr.mun.ca/home/DrNatererBio.php
E-mail: dean.engineering@mun.ca

◇ **Dr. Gary G. Wang, Professor, P.Eng., FASME**
Simon Fraser University
Mechatronic Systems Engineering
250-13450 102 Avenue, Surrey
British Columbia, V3T 0A3, Canada
Phone: 1-(778)-782-8495
Fax: 1-(778)-782-7514
Home page: http://www.ensc.sfu.ca/people/faculty/gary-wang
E-mail: gary_wang@sfu.ca

◇ **Dr. Magdy M.A. Salama, Professor, FIEEE, P.Eng.**
University of Waterloo
Department of Electrical and Computer Engineering
200 University Avenue West, Waterloo
Ontario, N2L 3G1, Canada
Phone: 1-(519)-888-4567 extension 33757
Fax: 1-(519)-746-3077
Home page: http://www.ece.uwaterloo.ca/~msalama
E-mail: m.salama@ece.uwaterloo.ca