

Amir Akhavan Masoumi

Curriculum Vitae

North Dartmouth, MA
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Education

- 2009-2015 **Ph.D. in Computer Science, University of Science Malaysia**
Research: Algorithm Design based on Chaos and Nonlinear Dynamics in Computer Science
- 2007-2009 **MSc. in Computer Science, University of Science Malaysia**
Research: Applications of Chaos in Information Security and Cryptography
- 1999-2004 **BSc. in Civil Engineering, Urmia Azad University, Iran**
Research: A new 3D Computer Aided Concrete Structure Design and Analysis Program based on ACI code.

Work Experience

- Sep. 2020 - **Full-time Faculty**, University of Massachusetts Dartmouth, North Dartmouth, MA
Current
- Dec. 2017 - **Post Doctoral Researcher**, New England Complex Systems Institute, Cambridge, MA
2020
- Global model of Weather dynamics for predicting extreme events
 - Supply chain inventory performance analysis using unsupervised machine learning
 - Design of interactive visualization dashboard for supply chain inventory model
 - Electronic Health Records data analysis
 - Analysis of social network data, ethnicity and migration
- Dec. 2016 - **Visiting Scientist**, CAMD, Northeastern University, Boston, MA
Dec. 2019
- Design, implementation and analysis of a flexible real-world simulation mechanics for Human-Computer optimization game model (using unity game design environment)
 - Analysis of cognitive load of users interacting with different HCI using eye-tracking devices, the results of this research are published in Advances in Intelligent Systems and Computing book series (2018)
- Nov. 2015 - **Post Doctoral Researcher**, School of Computer Sciences, University of Science Malaysia
Oct. 2016
- Design and implementation of cryptography algorithm using high-dimensional chaotic systems
 - Cryptanalysis of DNA-based image encryption algorithms

2013 - 2015 **Research Assistant**, Eye-tracking Lab, Centre for Instructional Technology & Multimedia, University of Science Malaysia

- Design of a new method for visual cognition estimation rate
- Experiment design and implementation of analysis of the accuracy of the visualization cognition model using eye-tracking and electroencephalogram devices data

2007 - 2015 **Research Assistant**, Information Security Lab, School of Computer Sciences, University of Science Malaysia

- Research on effect of composition of chaotic maps on entropy and randomness
- Design of a modern flexible parallel hash function of large files
- Investigating security of prng based on quantum chaotic maps

Computer Skills

- Programming skills
- Machine Learning/ Deep Learning: Sklearn, Pytorch & Tensor flow
 - Network Analysis: NetworkX & Gephi
 - Database Management: SQL Server, MySQL, PostgreSQL & MongoDB
 - Data Analysis and Simulation : Python, Matlab & Tableau
 - Information Visualization: Python & JavaScript (Kepler, DeckGL, D3JS & NodeJS)
 - Software Design: C++, Visual Basic .Net, C# & Java
 - Web Design: Javascript, PHP, Python & WordPress
- IDE
- Microsoft Visual Studio Code
 - Anaconda (Jupyter Notebook)
 - Unity3D - Mono Develop
 - JetBrains (WebStorm & PyCharm)
 - Azure Data Studio

Scientometrics and Citations

- Scientometrics
- h-index: 19
 - i-index: 22
 - Citations: 1625

GoogleScholar <https://scholar.google.com/citations?user=-1QlihYAAAAJ>

Scopus <https://www.scopus.com/authid/detail.uri?authorId=16314909600>

ORCID <https://orcid.org/0000-0003-0815-1869>

Publons <https://publons.com/researcher/1744556/amir-akhavan/>

Teaching and Supervision Experience

January 2020 **Teaching Assistant at week 2**, Concepts and Modeling in Complex systems, NECSI Summer School, Cambridge, MA

- June 2019 **Teaching Assistant at week 1**, Concepts and Modeling in Complex systems, NECSI Summer School, Cambridge, MA
- January 2019 **Teaching Assistant at week 2**, Networks and Data Analytics, NECSI Winter School, Cambridge, MA
- October 2016 **Game design project supervisor**, CAMD, Northeastern University, Boston, MA
- March 2016 **Parallel TRNG project supervisor**, CRG-Lab, University of Science Malaysia
- Semester (I) **Teaching Assistant**, Discrete Structures (CPT112) at School of Computer Sciences, 2011 - 2012 University of Science Malaysia
- Semester (II) **Teaching Assistant**, Logic & Applications (CPT114) at School of Computer Sciences, 2011 - 2012 University of Science Malaysia
- Semester (I) **Teaching Assistant**, Discrete Structures (CPT112) at School of Computer Sciences, 2010 - 2011 University of Science Malaysia
- Semester (II) **Teaching Assistant**, Logic & Applications (CPT114) at School of Computer Sciences, 2010 - 2011 University of Science Malaysia

Publication

- 2020 J. Norman, **A. Akhavan**, C. Shen, D. Aron, L. Leykum, Y. Bar-Yam, Towards prevention of adverse events using anticipatory analytics, *Progress in preventive medicine*
- 2020 E. Sert, L. Hedayatifar, R. A Rigg, **A. Akhavan**, O. Buchel, D. E. Saadi, A. Abubaker Kar, A. J Morales, Y. Bar-Yam, Freight Time and Cost Optimization in Complex Logistics Networks, *Complexity* (IF 2.591)
- 2019 **A. Akhavan**, D. Saadi, E. Sert, R.A. Rigg, A. Abubaker Kar, A.J. Morales, O. Buchel, L. Hedayatifar, Y. Bar-Yam, Investigating Dynamics of Inventory Discrepancies Using Historical Data: A case study, *management science* (submitted)
- 2019 A. Gros, R. Xulvi-Brunet, N. Deghani, **A. Akhavan**, Y. Bar-Yam, Ethnic spatial patterns of violence in the Greater New York Metropolitan area (ready for submission)
- 2019 A. Majooni, **A. Akhavan**, D. Offenhuber, An Eye-Tracking Study on Usability and Efficiency of Blackboard Platform, *Advances in Intelligent Systems and Computing*, vol 776, pp 281-289, Springer
- 2018 A. Majooni, M. Masood, **A. Akhavan**, An eye-tracking study on the effect of infographic structures on viewer's comprehension and cognitive load *Information Visualization* vol 17, Issue 3 (IF 1.15)
- 2017 **A. Akhavan**, A. Samsudin, A. Akhshani, Design and Analysis of a PRNG based on higher precision implementation of logistic Map *Journal of Nonlinear Dynamics* (Revised) (IF 3.464)
- 2017 **A. Akhavan**, A. Samsudin, A. Akhshani, Cryptanalysis of an image encryption algorithm based on DNA encoding *Optics and Laser Technology* 95, 94–99 (IF 1.87)
- 2017 A. Majooni, **A. Akhavan**, M. Masood, Real-Time Cognitive Load Measurement for Dynamic Modality Selection Using Eye-Tracking Methods *International Conference on Applied Human Factors and Ergonomics*, pp 229 - 237
- 2017 A. Majooni, M. Masood, **A. Akhavan**, An eye tracking study on effect of infographic structures on viewer's comprehension and cognitive load. *Journal of Information Visualization* (IF 0.68)

- 2016 A. Majooni, M. Masood, **A. Akhavan**, An Eye Tracking Experiment on Strategies to Minimize the Redundancy and Split Attention Effects in Scientific Graphs and Diagrams. *AHFE 2016, Florida, USA*
- 2016 A. Majooni, M. Masood, **A. Akhavan**, Comparing Effectiveness of Gestalt Laws in Digital and Printed Information Graphics Using Eye Tracking Methods. *INTED2016, Seville, Spain*
- 2015 A. Majooni, M. Masood, **A. Akhavan**, A novel scale for estimating cognitive load using eye tracking data. *Computers & Education (Revised)* (IF 0.8)
- 2015 A. Majooni, M. Masood, **A. Akhavan**, Scientific Visualizations Based on Integrated Model of Text and Picture Comprehension via Eye-tracking. *Procedia-Social and Behavioral Sciences*, Volume 176, 20 February 2015, pp 52 - 59
- 2015 **A. Akhavan**, A. Samsudin, A. Akhshani, Cryptanalysis of “an improvement over an image encryption method based on total shuffling”. *Optics Communications*, Volume 350, 1 Sept. 2015, pp 77 - 82 (IF:1.54)
- 2015 J.S Teh, A. Samsudin, M. Al-Mazrooie, **A. Akhavan**, GPUs and chaos: a new true random number generator. *Nonlinear Dynamics* (IF3.0)
- 2015 J.S. Teh, A. Samsudin, **A. Akhavan**, Parallel chaotic hash function based on the shuffle-exchange network. *Nonlinear Dynamics*, Volume 81, Issue 3, August 2015, pp 1067-1079, (IF:3.464)
- 2014 A. Akhshani, **A. Akhavan**, A. Mobaraki, S.-C. Lim, Z. Hassan, Pseudo random number generator based on quantum chaotic map. *Communications in Nonlinear Science and Numerical Simulation*, Volume 19, Issue 1, January 2014, pp 101 - 111 (IF:2.57)
- 2013 **A. Akhavan**, A. Samsudin, A. Akhshani, A novel parallel hash function based on 3D chaotic map. *EURASIP Journal on Advances in Signal Processing*, July 2013, 126 (IF: 1.73)
- 2013 S. Behnia, **A. Akhavan**, A. Akhshani, A. Samsudin, Image encryption based on the Jacobian elliptic maps. *Journal of Systems and Software*, Volume 86, Issue 9, Sept. 2013, pp 2429 - 2438 (IF:1.25)
- 2012 A. Akhshani, **A. Akhavan**, S-C. Lim, Z Hassan, An image encryption scheme based on quantum logistic map. *Communications in Nonlinear Science and Numerical Simulation*, Volume 17, Issue 12, December 2012, pp 4653 - 4661 (IF:2.57)
- 2012 **A. Akhavan**, A. Samsudin, A. Akhshani, On the Speed of “Image Encryption with Chaotically Coupled Chaotic Maps”. *International Journal of Computer Science Issues (IJCSI)*, Volume 9, Issue 3, May 2012
- 2011 **A. Akhavan**, A. Samsudin, A. Akhshani, A symmetric image encryption scheme based on combination of nonlinear chaotic maps. *Journal of the Franklin Institute*, Volume 348, Issue 8, October 2011, pp 1797 - 1813 (IF: 3.653)
- 2011 S. Behnia, **A. Akhavan**, A. Akhshani, A. Samsudin, A novel dynamic model of pseudo random number generator. *Journal of Computational and Applied Mathematics*, Volume 235, Issue 12, 15 Apr 2011, pp 3455 - 3463 (IF:1.08)
- 2010 S. Behnia, A. Akhshani, **A. Akhavan**, A novel scheme for image encryption based on a synchronized coupled map. *International Journal of Modern Physics B*, Volume 24, Issue 28, 10 November 2010, pp 5635 - 5651 (IF:0.94)
- 2009 **A. Akhavan**, A. Samsudin, A. Akhshani, Hash Function Based on Piecewise Nonlinear Chaotic Map, *Chaos, Solitons & Fractals*, Volume 42, Issue 2, 30 October 2009, pp 1046 - 1053 (IF:3.064)
- 2009 A. Akhshani, S. Behnia, **A. Akhavan**, M.A. Jafarizadeh, H. Abu Hassan, Z. Hassan, Hash function based on hierarchy of 2D piecewise nonlinear chaotic maps, *Chaos, Solitons & Fractals*, Volume 42, Issue 4, 30 November 2009, pp 2405 - 2412 (IF:3.064)

- 2009 S. Behnia, A. Akhshani, S. Ahadpour, **A. Akhavan**, H. Mahmodi, Cryptography based on chaotic random maps with position dependent weighting probabilities, *Chaos, Solitons & Fractals*, Volume 40, Issue 1, 15 Apr 2009, pp 362 - 369 (IF:1.50)
- 2009 S. Behnia, A. Akhshani, **A. Akhavan**, H. Mahmodi, Applications of tripled chaotic maps in cryptography, *Chaos, Solitons & Fractals*, Volume 40, Issue 1, 15 Apr 2009, pp 505 - 519 (IF:1.50)
- 2008 S. Behnia, A. Akhshani, **A. Akhavan**, H. Mahmodi, A novel algorithm for image encryption based on mixture of chaotic maps, *Chaos, Solitons & Fractals*, Volume 35, Issue 1, 15 Apr 2008, pp 408 - 419 (IF:3.064)
- 2008 S. Behnia , A. Akhshani, H. Mahmodi, **A. Akhavan**, Chaotic Cryptographic Scheme Based on Composition Maps, *International Journal of Bifurcation and Chaos (IJBC)*, Volume 18, Issue 01, Jan 2008, pp 251 - 261 (IF:1.02)
- 2007 S. Behnia, A. Akhshani, S. Ahadpour, H. Mahmodi, **A. Akhavan**, A fast chaotic encryption scheme based on piecewise nonlinear chaotic maps, *Physics Letters A*, Volume 366, Issues 4-5, 2 July 2007, pp 391 - 396 (IF:1.772)
- 2006 A. Akhshani, H. Mahmodi, **A. Akhavan**, A Novel Block Cipher Based on Hierarchy of One-Dimensional Composition Chaotic Maps, *Image Processing, 2006 IEEE International Conference on 2006*, pp 1993 - 1996
- 2006 **A. Akhavan**, H. Mahmodi, A. Akhshani, A new image encryption algorithm based on one-dimensional polynomial chaotic maps, *Lecture Notes Computer Science*, Volume 4263, 2006, pp 963 - 971

Workshops and Seminars

- 2014 - 2016 **Mendeley Advisor Program:** A set of workshops on Mendeley reference management software at School of Computer Sciences, University of Science Malaysia
- 2014 - 2015 **Scientific Research Methods:** Weekly Seminars on Scientific Research Methods at School of Computer Sciences, University of Science Malaysia
- 2015 **Academic Writing and Research Ethics:** Workshop on Academic Writing and Research Ethics in Computer Science
- 2014 **Introduction to Cyber-Security:** An introductory workshop to Cyber Security at School of Computer Sciences, University of Science Malaysia
- 2012 - 2013 **Academic Writing:** Set of 12 seminars on Academic Writing at Computer Sciences, University of Science Malaysia

Awards and Honors

- 2015 **Year's Best Publication Award (Sanggar Sanjung Award)- 2 times** From USM
- 2015 **Publication Award** from School of Computer Sciences
- 2014 **Publication Award** from School of Computer Sciences
- 2014 **Year's Best Publication Award (Sanggar Sanjung Award)**
- 2013 **Publication Award** from School of Computer Sciences
- 2012 **Publication Award** from School of Computer Sciences
- 2010 **Publication Award** from School of Computer Sciences
- 2009 **Year's Best Publication Award (Sanggar Sanjung Award)- 2 times** from USM
- 2009 **Three year USM Fellowship Award (2009-2012)**

Conferences

- 2018 ICCS 2018: International Conference on Applied Human Factors and Ergonomics, Cambridge, MA, USA, July 22 -27, 2018
- 2018 AHFE 2018: International Conference on Applied Human Factors and Ergonomics, Orlando, Florida, USA July 22-26, 2018
- 2017 AHFE 2017: International Conference on Applied Human Factors and Ergonomics, Los Angeles, CA, USA, July 17-21, 2017
- 2017 RISE 2017: Research Innovation Scholarship Entrepreneurship, Boston, MA, USA, April, 2017
- 2016 ICERI 2016 : 9th annual International Conference of Education, Research and Innovation, Sevilla, Spain, November 14-16, 2016
- 2016 INTED 2016: 10th annual International Technology, Education and Development Conference, Valencia, SPAIN, March 7-9, 2016
- 2016 AHFE 2016: International Conference on Applied Human Factors and Ergonomics, Orlando, FL, USA, July 27–31, 2016
- 2014 IETC 2014: International Educational Technology Conference, 3-5 September 2014, Chicago, IL, USA
- 2006 ICIP 2006: International Conference on Image Processing, GA, Atlanta, USA, October 8-11, 2006
- 2006 ISCIS 2006: 21th International Symposium, Istanbul, Turkey, November 1-3, 2006

Journal Peer Review Experience

2010-2020 Invited to do peer review:

- Journal of Applied Soft Computing (IF:4.873)
- Journal of Nonlinear Dynamics (IF:4.604)
- Journal of Chaos, Solitons & Fractals (IF:3.064)
- IEEE Access (IF:3.557)
- Journal of Signal Processing (IF:1.73)
- Journal of IET Image Processing (IF:1.401)
- Journal for Light and Electron Optics, Optik (IF:1.191)
- Journal of Physics Letters A (IF:1.772)
- Information Security Journal: A Global Perspective
- Journal of Information Science (IF:1.372)
- Journal of Information Security and Applications (IF:1.537)
- Journal of Neural Processing Letters (IF:1.787)
- Journal of Mathematical Problems in Engineering (IF:1.145)
- Journal of Franklin Institute (IF:3.653)
- Journal of Security and Communication Networks (IF:0.904)
- Journal of Electrical and Electronics Engineering Research
- Journal of Advances in Multimedia
- Cryptologia (IF:0.326)
- Mathematical Problems in Engineering (IF:1.13)
- Electronics Letters (IF:1.343)

*IF= Impact Factor

Languages

English **Fluent**

Persian **Fluent**

Turkish **Fluent**