

## MEHMET ONUR FEN

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### EDUCATION

- 2007–13 **Ph.D.**, Department of Mathematics, Middle East Technical University,  
*Supervisor: Prof. Dr. Marat AKHMET*  
*Thesis Title: The Input/Output Mechanism of Chaos Generation*
- 2004–08 **B.Sc.** (Double Major), Department of Physics, Middle East Technical University
- 2002–07 **B.Sc.**, Department of Mathematics, Middle East Technical University

### RESEARCH EXPERIENCE

- Nov. 2015–June 2016 **Postdoctoral Researcher**, Department of Mathematics, Middle East Technical University  
*Supervisor: Prof. Dr. Marat AKHMET*
- Nov. 2014–Nov. 2015 **Postdoctoral Researcher**, Neuroscience Institute, Georgia State University, Atlanta, Georgia, USA  
*Supervisor: Prof. Dr. Andrey SHILNIKOV*
- Jan. 2014–Nov. 2014 **Postdoctoral Researcher**, Department of Mathematics, Middle East Technical University  
*Supervisor: Prof. Dr. Marat AKHMET*

### TEACHING EXPERIENCE

- June 2016– **Associate Professor**, Basic Sciences Unit, TED University
- Feb. 2016–June 2016 **Part-time Instructor**, Department of Mathematics, Çankaya University
- Jan. 2014–June 2014 **Part-time Instructor**, Department of Mathematics, Middle East Technical University
- Sept. 2007–Dec.2013 **Research Assistant**, Department of Mathematics, Middle East Technical University

## PUBLICATIONS

### Book

M. Akhmet, M. O. Fen, Replication of Chaos in Neural Networks, Economics and Physics, Springer/HEP, Berlin, Heidelberg, 2016.

### Book Chapter

M. Akhmet, M. O. Fen, Input-output mechanism of the discrete chaos extension, pp. 203-233. In: V. Afraimovich, J. A. T. Machado, J. Zhang (Eds.), Complex Motions and Chaos in Nonlinear Systems, Springer, Switzerland, 2016.

### Publications in SCI, SCI-E, SSCI Indexed Journals

1. M. O. Fen, F. Tokmak Fen, Homoclinic and heteroclinic motions in hybrid systems with impacts, **Mathematica Slovaca** (accepted).
2. M. Akhmet, M. O. Fen, Existence of unpredictable solutions and chaos, **Turkish Journal of Mathematics** (accepted, Doi: 10.3906/mat-1603-51).
3. M. Akhmet, M. O. Fen, M. Kirane, Almost periodic solutions of retarded SICNNs with functional response on piecewise constant argument, **Neural Computing and Applications** (in press, Doi: 10.1007/s00521-015-2019-4).
4. M. Akhmet, M. O. Fen, Unpredictable points and chaos, **Communications in Nonlinear Science and Numerical Simulation**, 40 (2016) 1-5.
5. M. O. Fen, M. Akhmet, Impulsive SICNNs with chaotic postsynaptic currents, **Discrete and Continuous Dynamical Systems-Series B**, 21 (2016) 1119-1148.
6. M. Akhmet, M. O. Fen, Li-Yorke chaos in hybrid systems on a time scale, **International Journal of Bifurcation and Chaos**, 25 (2015) 1540024.
7. M. Akhmet, M. O. Fen, A. Kivircim, Li-Yorke chaos generation by SICNNs with chaotic/almost periodic postsynaptic currents, **Neurocomputing**, 173 (2016) 580-594.
8. M. Akhmet, M. O. Fen, Extension of Lorenz unpredictability, **International Journal of Bifurcation and Chaos**, 25 (2015) 1550126.
9. M. U. Akhmet, M. O. Fen, Attraction of Li-Yorke chaos by retarded SICNNs, **Neurocomputing**, 147 (2015) 330-342.
10. M. Akhmet, I. Rafatov, M. O. Fen, Extension of spatiotemporal chaos in glow discharge-semiconductor systems, **Chaos: An Interdisciplinary Journal of Nonlinear Science**, 24 (2014) 043127.
11. M. Akhmet, Z. Akhmetova, M. O. Fen, Chaos in economic models with exogenous shocks, **Journal of Economic Behavior & Organization**, 106 (2014) 95-108.

12. M. Akhmet, M. O. Fen, Generation of cyclic/toroidal chaos by Hopfield neural networks, **Neurocomputing**, 145 (2014) 230-239.
13. M. Akhmet, M. O. Fen, Chaotification of impulsive systems by perturbations, **International Journal of Bifurcation and Chaos**, 24 (2014) 1450078.
14. M. U. Akhmet, M. O. Fen, Entrainment by chaos, **Journal of Nonlinear Science**, 24 (2014) 411-439.
15. M. U. Akhmet, M. O. Fen, Shunting inhibitory cellular neural networks with chaotic external inputs, **Chaos: An Interdisciplinary Journal of Nonlinear Science**, 23 (2013) 023112.
16. M. U. Akhmet, M. O. Fen, Replication of chaos, **Communications in Nonlinear Science and Numerical Simulation**, 18 (2013) 2626-2666.
17. M. U. Akhmet, M. O. Fen, Chaotic period-doubling and OGY control for the forced Duffing equation, **Communications in Nonlinear Science and Numerical Simulation**, 17 (2012) 1929-1946.

### **Publications in Other Indexed Journals**

1. M. Akhmet, Z. Akhmetova, M. O. Fen, Exogenous versus endogenous for chaotic business cycles, **Discontinuity, Nonlinearity, and Complexity**, 5 (2016) 101–119.
2. M. Akhmet, M. O. Fen, Homoclinic and heteroclinic motions in economic models with exogenous shocks, **Applied Mathematics and Nonlinear Sciences**, 1 (2016) 1-10.
3. M. U. Akhmet, M. O. Fen, Replication of discrete chaos, **Chaotic Modeling and Simulation (CMSIM)**, 2 (2014) 129-140.
4. M. Akhmet, M. O. Fen, A new method of chaos generation, **Nonlinear Studies**, 21 (2014) 195-203.
5. M. U. Akhmet, M. O. Fen, New criteria for generalized synchronization preserving the chaos type, **Chaotic Modeling and Simulation (CMSIM)**, 3 (2013) 377-385.
6. M. U. Akhmet, M. O. Fen, Chaos generation in hyperbolic systems, **Discontinuity, Nonlinearity, and Complexity**, 1 (2012) 367-386.
7. M. O. Fen, Ş. Erkoç, Distribution of circles on a circle and correlation between vortex rings of superfluids, **Turkish Journal of Physics**, 31 (2007) 151- 159.

### **Conference Proceedings**

1. M. O. Fen, Homoclinic and heteroclinic motions in hybrid systems on a time scale, **Proceedings of Dynamic Systems and Applications** (accepted).
2. M. Akhmet, M. O. Fen, A. Kivilcim, Chaos by neural networks: The quasi-periodic route, **Proceedings of International Conference on Applied Informatics for Health and Life Sciences Turkish-German Workshop on Bioinformatics: Recent Developments from Health to Nanotechnology**, 2014, pp. 119-122.

3. M. Akhmet, M. O. Fen, Period-doubling route to chaos in shunting inhibitory cellular neural networks, **Proceedings of 8th International Symposium on Health Informatics and Bioinformatics (HIBIT)**, 2013, pp. 1-5.
4. M. U. Akhmet, M. O. Fen, The period-doubling route to chaos in the relay system, **Proceedings of Dynamic Systems and Applications**, 6, 2012, pp. 22–26.

### **ATTENDED CONFERENCES**

1. 11. Ankara Matematik Günleri, May 26-27, 2016, Ankara University, Ankara, Turkey. **(Oral Presentation)**
2. International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM 2016), May 19-23, 2016, Bodrum, Mugla, Turkey. **(Oral Presentation)**
3. 2015 Scientific Computing Day Conference, September 18, 2015, Georgia State University, Atlanta, Georgia, USA.
4. The 2015 Annual Meeting for The Society for Mathematical Biology, June 30-July 3, 2015, Georgia State University, Atlanta, Georgia, USA. **(Oral Presentation)**
5. Seventh International Conference on Dynamic Systems and Applications & the Fifth International Conference on Neural, Parallel, and Scientific Computations, May 27-30, 2015, Morehouse College, Atlanta, Georgia, USA. **(Oral Presentation)**
6. 2015 Carolina Dynamics Symposium, April 25-26, 2015, Agnes Scott College, Atlanta, Georgia, USA. **(Oral Presentation)**
7. 2015 Georgia Scientific Computing Symposium, February 28, 2015, Georgia Institute of Technology, Atlanta, Georgia, USA. **(Poster Presentation)**
8. 5th International Conference on Nonlinear Science and Complexity, August 4-9, 2014, Xi'an Jiaotong University, Xi'an, China. **(Oral Presentation)**
9. International Conference on Nonlinear Differential and Difference Equations: Recent Developments and Applications, May 27-30, 2014, Side, Antalya, Turkey. **(Oral Presentation)**
10. 2<sup>nd</sup> International Workshop on Complex Dynamical Systems and Their Applications, October 24-26, 2013, Işık University, İstanbul, Turkey.
11. 8<sup>th</sup> International Symposium on Health Informatics and Bioinformatics (HIBIT), September 25-27, 2013, Middle East Technical University, Ankara, Turkey. **(Oral Presentation)**
12. 6<sup>th</sup> Chaotic Modeling and Simulation International Conference, June 11-14, 2013, Yeditepe University, İstanbul, Turkey. **(Oral Presentation)**
13. 1<sup>st</sup> National Workshop on Complex Dynamical Systems and Their Applications, September 12-13, 2012, TOBB University of Economics and Technology, Ankara, Turkey. **(Oral Presentation)**
14. Sixth International Conference on Dynamic Systems and Applications, May 25-28, 2011, Morehouse College, Atlanta, Georgia, USA. **(Oral Presentation)**

## **RESEARCH INTERESTS**

- Chaotic Dynamical Systems
- Impulsive Differential Equations
- Delay Differential Equations
- Partial Differential Equations
- Mathematical Models of Neural Networks
- Almost Periodicity
- Differential Equations with Piecewise Constant Argument
- Dynamic Equations on Time Scales

## **AWARD**

- Middle East Technical University, Best Thesis Award, 2014

## **SCHOLARSHIPS**

- TÜBİTAK 2219 Postdoctoral Research Scholarship
- TÜBİTAK 2228 Scholarship for Graduate Students

## **ORGANIZING ACTIVITIES FOR CONFERENCES**

- Organizing Committee Member, The 3rd International Conference on Complex Dynamical Systems and Their Applications: New Mathematical Concepts and Applications in Life Sciences, November 24-26, 2014, TOBB University of Economics and Technology, Ankara, Turkey.
- Organizing Committee Member, 1<sup>st</sup> National Workshop on Complex Dynamical Systems and Their Applications, September 12-13, 2012, TOBB University of Economics and Technology, Ankara, Turkey.