

## Dr. Muhammet Uzuntarla

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CONTACT INFORMATION	Zonguldak Bulent Ecevit University, Department of Biomedical Engineering, Farabi Campus, 67100 Incivez Zonguldak, Turkey
KEYWORDS	<i>Biomedical Engineering, Computational Neuroscience, Electronic Instrumentation, Dynamical Systems.</i>
EDUCATION	<b>Ph.D</b> , Electrical and Electronics Engineering, University of Sakarya, Turkey. 2011 <b>MSc</b> , Electrical and Electronics Engineering, Zonguldak Karaelmas University, Turkey. 2006 <b>BS</b> , Electronics and Communications Engineering, University of Kocaeli, Turkey. 2003
POSITIONS	<b>Prof. Dr.</b> , Department of Biomedical Engineering, Zonguldak Bulent Ecevit University, Turkey, 2020 - <i>present</i> <b>Research Fellow</b> , Centre for Neural Dynamics, University of Ottawa, Canada, 2019 -2020 <b>Research Fellow</b> , Krasnow Institue for Advanced Studies, George Mason University, USA, 2015 - 2016 <b>Assoc. Prof. Dr.</b> , Department of Biomedical Engineering, Zonguldak Bulent Ecevit University, Turkey, 2015 -2020 <b>Asst. Prof. Dr.</b> , Department of Biomedical Engineering, Zonguldak Bulent Ecevit University, Turkey, 2011 -2015 <b>Research Assistant</b> , Department of Electrical and Electronics Engineering, Zonguldak Bulent Ecevit University, Turkey, 2004- 2011
PROFESSIONAL SERVICE	<ul style="list-style-type: none"><li>• Editor in Chief, Turkish Journal of Electrical Engineering and Computer Sciences, 2019-<i>present</i>.</li><li>• IASTE Representative of Zonguldak Bulent Ecevit University, 2020-<i>present</i>.</li><li>• Asistant Editor in Chief, Turkish Journal of Electrical Engineering and Computer Sciences, 2016 - 2019.</li><li>• Editorial Board Member, Neurocomputing, 2016 - <i>present</i>.</li><li>• Editorial Board Member, Fluctuations and Noise Letters, 2018-<i>present</i>.</li><li>• Chair, Department of Biomedical Engineering, Bulent Ecevit University, 2017-2019.</li><li>• Deputy Chair, Department of Biomedical Engineering, Bulent Ecevit Univertisty, 2011 - 2015.</li><li>• Principle Investigator of the Biomedical Calibration Application and Research Center, 2013 - 2015.</li></ul>
REFEREED JOURNAL PUBLICATIONS (SCI-INDEXED)	<ol style="list-style-type: none"><li>26. A.Calim, T. Palabas, M. Uzuntarla. Stochastic and vibrational resonance in complex networks of neurons. <i>Philosophical Transactions of the Royal Society A</i>, 79: 20200236, 2021.</li><li>25. P. Das, S. Das, P. Das, F.A Rihan, M. Uzuntarla, D. Ghosh. A model-based optimal control strategy for cancer eradication with combinatorial therapy. <i>Chaos, Solitons and Fractals</i>,145: 110789, 2021.</li><li>24. A.Calim, A. Longtin, M. Uzuntarla. Vibrational resonance in a neuron-astrocyte coupled model. <i>Philosophical Transactions of the Royal Society A</i>, 79: 20200267, 2021.</li></ol>

23. A.Çalim, J.J. Torres, M.Ozer, M. Uzuntarla. Chimera States in Hybrid Coupled Neuron Populations. *Neural Networks*, 126: 108-117, 2020.
22. J.J. Torres, M. Uzuntarla, J. Marro. A Theoretical Description of Inverse Stochastic Resonance in Nature. *Communications in Nonlinear Science and Numerical Simulation*, 80: 104975, 2020.
21. M. Uzuntarla. Firing dynamics in hybrid coupled populations of bistable neurons. *Neurocomputing*, 367:328-336, 2019.
20. M. Uzuntarla, J.J. Torres, A. Çalim, E. Barreto. Spike termination in networks of bistable neurons. *Neural Networks*, 110: 131-140, 2019.
19. S.N. Agaoglu, A. Çalim, P. Höevel, M. Özer, M. Uzuntarla. Vibrational resonance in a Scale-Free network with different coupling schemes. *Neurocomputing*, 325: 59-66, 2019.
18. A. Çalim, P. Höevel, M. Özer, M. Uzuntarla. Chimera states in networks of Type-I Morris-Lecar neurons. *Physical Review E*, 98 (6), 2018.
17. M. Uzuntarla, E. Barreto, J. J. Torres. Inverse stochastic resonance in networks of spiking neurons. *PLoS Computational Biology*, 13(7): e1005646, 2017.
16. M. Uzuntarla, J. J. Torres, P. So, M. Ozer, E. Barreto. Double inverse stochastic resonance with dynamic synapses, *Physical Review E*, 95 (1), 012404, 2017.
15. M. Uzuntarla, M. Ozer, U. Ileri, A. Calim, J. J. Torres. Effects of dynamic synapses on noise-delayed response latency of a single neuron, *Physical Review E*, 92 (6), 062710, 2015.
14. M. Uzuntarla, E. Yilmaz, A. Wagemakers, M. Ozer. Vibrational resonance in a heterogeneous Scale Free network of neurons. *Communications in Nonlinear Science and Numerical Simulations*, 22(1-3): 367-374, 2015.
13. M. Uzuntarla, J.R. Cressmann, M. Ozer, E. Barreto. Dynamical structure underlying inverse stochastic resonance and its implications, *Physical Review E*, 88, 042712, 2013.
12. M. Uzuntarla. Inverse stochastic resonance induced by synaptic background activity with unreliable synapses. *Physics Letters A*, 373(38): 2585-2589, 2013.
11. M. Uzuntarla, R. Uzun, E. Yilmaz, M. Ozer, M. Perc. Noise-delayed decay in the response of a scale-free neuronal network. *Chaos, Solitons and Fractals*, 56: 202-208, 2013.
10. E. Yilmaz, M. Uzuntarla, M. Ozer, M. Perc. Stochastic resonance in hybrid scale-free neuronal networks. *Physica A: Statistical Mechanics and its Applications*, 392(22): 5735-5741, 2013.
9. M. Uzuntarla, M. Ozer, D. Guo. Controlling the first-spike latency response of a single neuron via unreliable synaptic transmission. *European Physical Journal B*, 85(8): 282-289, 2012.
8. M. Ozer, M. Perc, M. Uzuntarla, E. Koklukaya. Weak signal propagation through noisy feedforward neuronal networks. *NeuroReport*, 21(5): 338-343, 2010.
7. M. Ozer, M. Uzuntarla, M. Perc, L.J. Graham. Spike latency and jitter of neuronal membrane patches with stochastic Hodgkin-Huxley channels. *Journal of Theoretical Biology*, 261(1): 83-92, 2009.
6. M. Ozer, M. Perc, M. Uzuntarla. Controlling the spontaneous spiking regularity via channel blocking on Newman-Watts networks of Hodgkin-Huxley neurons. *EuroPhysics Letters (EPL)*, 86(4): 40008, 2009.

5. M. Ozer, M. Perc, M. Uzuntarla. Stochastic resonance on Newman-Watts networks of Hodgkin-Huxley neurons with local periodic driving, *Physics Letters A*, 373 (10): 964-968, 2009.
4. M. Ozer, M.Uzuntarla, T. Kayikcioglu, L.J. Graham. Collective temporal coherence for subthreshold signal encoding on a stochastic small-world Hodgkin-Huxley neuronal network. *Physics Letters A*, 372 (43): 6498-6503, 2008.
3. M. Ozer, M. Uzuntarla. Effects of the network structure and coupling strength on the noise-induced response delay of a neuronal network. *Physics Letters A*, 372 (25): 4603-4609, 2008.
2. M. Ozer, L.J. Graham, O. Erkaymaz, M. Uzuntarla. Impact of synaptic noise and conductance state on spontaneous cortical firing. *NeuroReport*, 18:1371-1374, 2007.
1. M. Ozer, M. Uzuntarla, S.N. Agaoglu. Effect of the subthreshold periodic current forcing on the regularity and the synchronization of neuronal spiking activity. *Physics Letters A*, 360 (1): 135-140, 2006.

#### BOOK CHAPTERS

1. M. Ozer, M. Uzuntarla. Synchronization between neuronal spiking activity and subthreshold sinusoidal stimuli based on the FitzHugh-Nagumo model. *Mathematical Methods in Engineering*, Eds. K. Tas, J.A. Tenreiro Machado and D. Baleanu, Springer ISBN: 978-1-4020-5677-2, 415-421,2007.

#### INTERNATIONAL CONFERENCE PROCEEDINGS

9. A. Çalim, P. Hövel, M. Özer, M. Uzuntarla, Chimera State in Neuron Populations with Dynamical Synapses, *DPG Spring Meeting - Berlin18*, Berlin, Germany, March 11-16, 2018.
8. A. Calim, U. Ileri, M. Uzuntarla, M.Ozer. Vibrational resonance in feed-forward neural network motifs. *24th Annual Computational Neuroscience Meeting: CNS\*2015, Prague, Czech Republic*, July 18-23, 2015.
7. M.Uzuntarla, J.R. Cressman, M.Ozer, E. Barreto. Inverse stochastic resonance induced by ion channel noise. *21th Annual Computational Neuroscience Meeting: CNS\*2012, Decatur, GA, USA, BMC Neuroscience 13 (Suppl 1) P181*, July 21-26, 2012.
6. M.Uzuntarla, M.Ozer, E. Koklukaya. Optimization of weak signal propagation in a feed-forward network. *20th Annual Computational Neuroscience Meeting: CNS \*2011, Stockholm, Sweden, BMC Neuroscience 2011, 12(Suppl 1): P176*, July 23-28, 2011.
5. M. Uzuntarla, M. Ozer, E. Koklukaya. Propagation of firing rate in a feedforward network of Hodgkin-Huxley neurons. *20th Biennial International Eurasip Conference-BIOSIGNAL 2010, Brno, Czech Republic, Analysis of Biomedical Signals and Images, 20: 122-128, ISBN 978-80-214-4106-4 June 27-29, 2010.*
4. M. Ozer, M. Uzuntarla, L.J. Garaham. Effect of ratio of inhibitory and excitatory conductance on regularity of spontaneous cortical activity. *19th Biennial International Eurasip Conference-BIOSIGNAL 2008, Brno, Czech Republic, Analysis of Biomedical Signals and Images, 64-68, ISBN 978-80-214-3613-8, June 29- July 1, 2008.*

3. M. Ozer, M. Uzuntarla, S.N. Agaoglu. Effect of the sub-threshold periodic current forcing with noise on the synchronization of neuronal spiking activity. *15th Annual Computational Neuroscience Meeting: CNS\*2006, Edinburgh, UK, Abstract Book*, 80, July 16-20, 2006.
2. M. Ozer, M. Uzuntarla. Synchronization between neuronal spiking activity and sub-threshold sinusoidal stimuli based on the FitzHugh-Nagumo model. *Mathematical Methods in Engineering-MME06, Ankara, Turkey, Abstract Book*, 42, April 27-29, 2006.
1. M. Ozer, M. Uzuntarla. Investigation of synchronization between neuronal spiking activity and subthreshold sinusoidal forcing. *18th Biennial International Eurasip Conference-BIOSIGNAL 2006, Brno, Czech Republic, Analysis of Biomedical Signals and Images*, 84-86, ISBN 80-214-3152-0, June 28-30, 2006.

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5. U. Ileri, A. Calim, M. Ozer, M. Uzuntarla, Latency coding in neurons with short-term synaptic depression and facilitation. *Journal of the Istanbul Faculty of Medicine*, 77(1): 72, 2014.
4. A. Calim, M. Uzuntarla, M. Ozer, Effects of heterogeneity and synaptic dynamics on weak signal processing in neuron populations. *Journal of the Istanbul Faculty of Medicine*, 77(1): 71, 2014.
3. M. Uzuntarla, M. Ozer. Effects of neuronal noise on information coding for different stimulation regions. *Teknoloji*, 10 (1): 1-11, 2007.
2. O. Erkamaz, M. Uzuntarla, M. Ozer. Effect of the correlation in synaptic background activity on the latency of neocortical neurons. *Neuroanatomy*, 6(1): 6, 2007.
1. M. Uzuntarla, M. Ozer. Synchronization between neuronal spiking activity and sub-threshold periodic stimulus for two different noise models. *Neuroanatomy*, 5(1): 17, 2006.

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PROCEEDINGS

25. A. Çalim, M. Özer, M. Uzuntarla, Nöral Sistemde Kanal Gürültüsü ve Dinamik Sinaps Yapısının Latans Dinamiklerine Etkisi, *IEEE 26. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU2018)*, İzmir, 2-5 Mayıs 2018.
24. A. Çalim, M. Özer, M. Uzuntarla, "Heterojen Nöron Ağlarında Eşik Altı Sinyal Algılama", *IEEE 26. Sinyal İşleme ve İletişim Uygulamaları Kurultayı (SIU2018)*, İzmir, 2-5 Mayıs 2018
23. A. Çalim, M. Özer, M. Uzuntarla, Nöronal Ağlarda Kısa Dönem Sinaptik Depresyonun Vibrasyonel Rezonansa Etkileri, *TIPTEKNO'17*, Trabzon, 12-14 Ekim 2017.
22. A. Çalim, M. Özer, M. Uzuntarla, Parkinsonlu Globus Pallidus Çekirdeklerinin Farklı Ağ Motifleriyle Simülasyonu, *TIPTEKNO'17*, Trabzon, 12-14 Ekim 2017.
21. A. Calim, M. Ozer, M. Uzuntarla, Simulation of parkinsonian basal nuclei with network motifs. *IEEE 25th Signal Processing and Communications Applications, SIU 2017, Antalya, Turkey 2017*.
20. A. Calim, S.N. Agaoglu, M. Uzuntarla, Synchronization induced termination in neuronal networks. *IEEE 25th Signal Processing and Communications Applications, SIU 2017, Antalya, Turkey 2017*.

19. S.N. Agaoglu, M. Ozer, A. Calim, M. Uzuntarla, Effects of synaptic time delay on vibrational resonance in neuronal networks. *IEEE 25th Signal Processing and Communications Applications, SIU 2017, Antalya, Turkey 2017.*
18. S.N. Agaoglu, M. Ozer, A. Calim, M. Uzuntarla, Effects of subthreshold excitation characteristics on vibrational resonance in weighted Scale-Free network. *IEEE 25th Signal Processing and Communications Applications, SIU 2017, Antalya, Turkey 2017.*
17. S.N. Agaoglu, A. Calim, M. Ozer, M. Uzuntarla, Effects of synaptic heterogeneity on vibrational resonance in biological neural networks. *TIPTEKNO 2016, Antalya, Turkey 2016.*
16. A. Calim, U. Ileri, M. Uzuntarla, M. Ozer, Effects of synaptic reliability on the regularity of neuronal firing. *IEEE 23th Signal Processing and Communications Applications, SIU 2015, Malatya, Turkey 2015.*
15. U. Ileri, A. Calim, M. Uzuntarla, M. Ozer, The role of short-term synaptic depression and adaptive threshold on cortical irregular spike activity. *IEEE 23th Signal Processing and Communications Applications, SIU 2015, Malatya, Turkey 2015.*
14. U. Ileri, A. Calim, M. Ozer, M. Uzuntarla, Latency coding in neurons with short-term synaptic depression and facilitation. *12th National Neuroscience Conference, USK 2014, Istanbul, Turkey 2014.*
13. A. Calim, M. Uzuntarla, M. Ozer, Effects of heterogeneity and synaptic dynamics on weak signal processing in neuron populations. *12th National Neuroscience Conference, USK 2014, Istanbul, Turkey 2014.*
12. A. Calim, M. Uzuntarla, M. Ozer, Effects of heterogeneity on information processing in biological neural networks, *IEEE 22th Signal Processing and Communications Applications, SIU 2014, Trabzon, Turkey 2014.*
11. M. Uzuntarla, M. Ozer, E. Koklukaya. Propagation of firing rate in feedforward biological neural networks with ion channel noise. *IEEE 18th Signal Processing and Communications Applications, SIU 2010, Diyarbakir, Turkey 2010.*
10. M. Uzuntarla, M.Ozer. Effects of network topology and ion channel noise on the spatial synchronization in a biological neural network. *ELECO 2008, 225-228, Bursa, Turkey, 2008.*
9. M. Ali Ozsoy, M. Ozer, M. Uzuntarla. Effects of noise and synaptic coupling on neuronal network synchronization. *BIYOMUT 2007, 139-143, Istanbul, Turkey, 2007.*
8. M. Uzuntarla, M. Ozer. Effect of subthreshold fluctuations of membrane potential on the firing threshold of neuron. *BIYOMUT 2007, 134-138, Istanbul, Turkey, 2007.*
7. M. Ozer, O. ErKaymaz, M. Uzuntarla. Effect of the statistical parameters of synaptic background activity on the firing regularity and the effective refractory period of cortical neuron. *BIYOMUT 2007, 144-148, Istanbul, Turkey, 2007.*
6. M. Ali Ozsoy, M. Uzuntarla, M. Ozer. Change in response time of neuronal populations with noise, synaptical interactions and stimulus frequency. *IEEE 15th Signal Processing and Communications Applications, SIU 2007, Eskisehir, Turkey, 2007.*
5. M. Ozer, O. ErKaymaz, M. Uzuntarla. Effect of the correlation in synaptic background inputs on the regularity of neocortical neuron firing activity. *IEEE 15th Signal Processing and Communications Applications, SIU 2007, Eskisehir, Turkey, 2007.*

4. O. ErKaymaz, M. Uzuntarla, M. Ozer. Effect of the correlation in synaptic background activity on the latency of neocortical neurons. *VI. 6th National Neuroscience Congress*, Karabuk, Turkey, 2007.
3. M. Uzuntarla, M. Ozer. Anticipated synchronization in neuronal communication. *ELECO 2006*, 201-204, Bursa, Turkey, 2006.
2. M. Uzuntarla, M. Ozer. Effect of intrinsic noise characteristics on the neuronal dynamics. *ELECO 2006*, 205-208, Bursa, Turkey, 2006.
1. M. Uzuntarla, M. Ozer. Synchronization between neuronal spiking activity and sub-threshold periodic stimulus for two different noise models. *5th National Neuroscience Congress*, Zonguldak, Turkey, 2006.

#### COLLABORATORS

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#### TEACHING

**Bulent Ecevit University**, Department of Biomedical Engineering

- *Thought Courses*: Electronics, Electronic Circuits, Logic Circuits, Biomedical Instrumentation, Bioelectricity, Mathematical Physiology, Microprocessors/Microcontrollers, Semiconductor Physics

**Granada University**, Department of Electromagnetism and Matter Physics, Granada, Spain, Dec 3-7, 2012

- *Lectures*: Complex Network Models
- Guest Lecturer-Erasmus Mundus Teaching Staff Mobility

**Ghent University**, Department of Data Analysis, Ghent, Belgium, March 25-29, 2013

- *Lectures*: Complex Neural Networks
- Guest Lecturer-Erasmus Mundus Teaching Staff Mobility

**Granada University**, Department of Electromagnetism and Matter Physics, Granada, Spain, September 16-20, 2013

- *Lectures*: Short-Term Synaptic Plasticity
- Guest Lecturer-Erasmus Mundus Teaching Staff Mobility

**University of Rey Juan Carlos**, Department of Physics, Madrid, Spain, January 20-24, 2014

- *Lectures*: Computational Neuroscience
- Guest Lecturer-Erasmus Mundus Teaching Staff Mobility

**Technical University Berlin**, Institut für Theoretische Physik, Berlin, Germany, February 9-20, 2015; April 10-18, 2017.

- *Lectures*: Vibrational Resonance
- Guest Lecturer-Erasmus Mundus Teaching Staff Mobility