CURRICULUM VITAE

Barış Atakan, PhD

Professor, Department of Electrical and Electronics Engineering, İzmir Institute of Technology, Urla, İzmir, 35430, Turkey
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EDUCATIONAL BACKGROUND

(2011-2012) **Georgia Institute of Technology, Atlanta, USA**
Postdoctoral Research Fellow in School of Electrical and Computer Engineering — July 2012
Project: MoNaCo: Molecular Nano-Communication Networks (Grant No. 1110947)

(2006-2011) **Koç University, İstanbul, Turkey,**
Ph.D. in Electrical and Electronics Engineering — December 2011
Thesis: Bio-inspired Communication Theories and Techniques for Next-Generation Networks
Advisor: *Dr. Ozgur B. Akan*

(2002-2005) **Middle East Technical University, Ankara, Turkey**
M.Sc. in Electrical and Electronics Engineering — December 2005
Thesis: 3-D Grasping During Serpentine Motion with a Snake-Like Robot
Advisor: *Dr. İsmet Erkmen*

(1995-2000) **Ankara University, Ankara, Turkey**
B.Sc. in Electronics Engineering — June 2000
Graduation Project: Detection of Chronic Sleeping Disorder Through Analysis of EEG Records

RESEARCH INTERESTS

- **Molecular communications:** Specifically, detection and estimation of molecular information, reconstruction of molecular signals, information theoretical analysis of molecular communication channel, effects of electromagnetic field on molecular signaling and its potential medicine applications
- **Bio-inspired Communications:** Specifically, bio-inspired communication and networking techniques for wireless networks, wireless sensor networks, wireless sensor and actor networks
- **Nanonetworks:** Specifically, body-area nanonetworks for nanomedicine applications, mobile ad hoc nanonetworks and graphene-based nanonetworks, specifically molecular communications and nanoscale electromagnetic communications
- **Wireless Networks:** Specifically, energy-harvesting wireless networks, delay-tolerant networks

PROFESSIONAL EXPERIENCE

(2021-) **Professor,** Department of Electrical and Electronics Engineering,
İzmir Institute of Technology, Urla, İzmir, Türkiye
• Teaching, research on bio-inspired and molecular communications, conducting research projects

(2015-2021) **Associate Professor,** Department of Electrical and Electronics Engineering,
İzmir Institute of Technology, Urla, İzmir, Türkiye
• Teaching, research on bio-inspired and molecular communications, conducting research projects

(2014-2015) **Assitant Professor,** Department of Electrical and Electronics Engineering,
İzmir Institute of Technology, Urla, İzmir, Türkiye
• Teaching, research on bio-inspired and molecular communications, conducting research projects

(2012-2014) **Specialist,** Department of Electrical and Electronics Engineering,
İzmir Institute of Technology, Urla, İzmir, Türkiye
• Teaching and research on bio-inspired and molecular communications

(2011-2012) **Postdoctoral Research Fellow,** Broadband Wireless Networking Laboratory,
School of Electrical & Computer Engineering, Georgia Institute of Technology, Atlanta, GA, USA
• Investigation of fundamentals of molecular communications in nanonetworks

(2010-2011) **Graduate Research and Teaching Assistant,** Next-generation & Wireless Communications Laboratory,
Department of Electrical & Electronics Engineering, Koç University, İstanbul, Turkey
• Teaching information theory and signal processing
• Investigation and development of frontier nanoscale communication paradigms for nanonetworks
• Development of bio-inspired communication algorithms for wireless networks

(2006-2010) **Graduate Research Assistant,** Next-generation & Wireless Communications Laboratory,
Department of Elec. & Electronics Engineering, Middle East Technical University, Ankara, Turkey
• Investigation and development of frontier nanoscale communication paradigms for nanonetworks
• Development of bio-inspired communication algorithms for wireless networks

(2005-2006) **Graduate Research and Teaching Assistant,** Department of Industrial Technology Education,
Gazi University, Ankara, Turkey
• Teaching software

(2004-2005) **Lecturer,** Department of Electronics and Telecommunications,
Kirikkale University, Kirikkale, Turkey
• Teaching communication theory and signal processing

PROJECTS

- **Signal Reconstruction in Molecular Communications**, The Scientific and Technological Research Council of Turkey (TÜBİTAK) Grant no. 119E041, (2019-2022) **/ Principle Investigator**
- **Detection and Estimation of Molecular Information in Molecular Communications**, TÜBİTAK Grant no. 115E362, (2015-2018) **/ Principle Investigator**
- **Wireless Micro-current Stimulator for Chronic Wound and Burn Treatments**, TÜBİTAK Grant no. 2150529, (2016-2017), **/ Principle Investigator**
- **MoNaCo: Molecular Nano-Communication Networks**, National Science Foundation (NSF) Grant no. 1110947, (2011-2012) **/ Post Doctoral Research Fellow**
- **Bio-inspired Communications for Large Scale Systems**, TUBITAK Grant no. 106E179, (2006-2009) **/ Researcher**
- **Nano-scale and Quantum Communication Networks**, TUBITAK Grant no. 109E257, (2010-2011)**/Researcher**
- **Wireless Passive Sensor Networks**, TUBITAK Grant no. 104E043, (2009-2010) **/ Researcher**
- **Communication Protocols for Next-generation Multi-service Wireless Internet**, (2005-2006), TUBITAK-COST 290 **/ Researcher**

PUBLICATIONS

- **Book:** 1 (English and Chinese Editions)
- **Journal Papers:** 20
- **Book Chapters:** 4
- **Conference Papers:** 11
- **Total Citations:** 1807 (by Google Scholar)
- **h-index**: 16

Book

1) B. Atakan, *"Molecular Communications and Nanonetworks: From Nature To Practical Systems,"* **Springer, New York**, 2014. (Chinese Edition: Harbin Institute of Technology Press, 2018).

Journal Papers

1) F. Güleç, B. Atakan, F. Dressler, *"Mobile human ad hoc networks: A communication engineering viewpoint on interhuman airborne pathogen transmission"* **Nano Communication Networks (Elsevier)**, vol. 32-33, June 2022.

2) A. Al-Qamaji, B. Atakan, *"Event Distortion-Based Clustering Algorithm for Energy Harvesting Wireless Sensor Networks"* **Wireless Personal Communications (Springer)**, vol. 123, no. 4, pp. 3823-3843, April 2022.

3) F. Güleç, B. Atakan, *"Fluid dynamics-based distance estimation algorithm for macroscale molecular communication,"* **Nano Communication Networks (Elsevier)**, vol. 28, pp.100351, June 2021.

4) F. Güleç, B. Atakan, *"A molecular communication perspective on airborne pathogen transmission and reception via droplets generated by coughing and sneezing,"* **IEEE Transactions on Molecular, Biological and Multi-Scale Communications**, vol. 7, no. 3, pp. 175-184, May 2021.

5) F. Güleç, B. Atakan, *"A Droplet-based Signal Reconstruction Approach to Channel Modeling in Molecular Communication,"* **IEEE Transactions on Molecular, Biological and Multi-Scale Communications**, vol. 7, no. 1, pp. 64-68, Dec. 2020.

6) F. Güleç, B. Atakan, *"Distance Estimation Methods for a Practical Macroscale Molecular Communication System,"* **Nano Communication Networks (Elsevier)**, vol. 24, May 2020.

7) B. Atakan, F. Güleç *"Signal Reconstruction in Diffusion-based Molecular Communication,"* **Transactions on Emerging Telecommunication Systems (Wiley)**, vol. 30, no. 12, Dec. 2019.

8) B. Atakan, S. Galmés, *"Effects of Framing Errors on the Performance of Molecular Communications with Memory,"* **IEEE Access**, vol. 8, pp. 19970-19981, Jan. 2020.

9) S. Galmés, B. Atakan, *"Performance Analysis of Diffusion-Based Molecular Communications with Memory,"* **IEEE Transactions on Communications**, vol. 64, no. 9, Sept. 2016.

10) B. Atakan, *"On Exploiting Sampling Jitter in Vehicular Sensor Networks,"* **IEEE Transactions on Vehicular Technology**, vol. 63, no. 1, pp. 403-407, Jan. 2014.

11) B. Atakan, *"Optimal transmission probability in binary molecular communication,"* **IEEE Communications Letters**, vol. 17, no. 6, pp. 1152-1155, June 2013.

12) B. Atakan and O. B. Akan, *"Biological foraging-inspired communication in intermittently connected mobile cognitive radio ad hoc networks,"* **IEEE Transactions on Vehicular Technology**, vol. 61, no. 6, pp. 2651-2658, July 2012.

13) B. Atakan, S. Galmés, and O. B. Akan, *"Nanoscale Communication with Molecular Arrays in Nanonetworks,"* **IEEE Transactions on Nanobiosciences**, vol. 11, no. 2, pp. 149-160, June 2012.

14) B. Atakan and O. B. Akan, *"Bio-inspired Cross-layer Communication in Wireless Sensor and Actuator Networks,"* **IEEE Transactions on Vehicular Technology**, vol. 61, no. 5, pp. 2185-2193, June 2012.

15) A. Guney, B. Atakan and O. B. Akan, *"Mobile Ad Hoc Nanonetworks with Collision-based Molecular Communication,"* **IEEE Transactions on Mobile Computing**, vol. 11, no. 3, pp. 353-366, March 2012.

16) B. Atakan, S. Balasubramaniam, and O. B. Akan, *"Body Area NanoNetworks with Molecular Communications in Nanomedicine,"* **IEEE Communications Magazine**, vol. 50, no. 1, pp. 28-34, January 2012.

17) B. Atakan, and O. B. Akan, *"Carbon Nanotube-based Nanoscale Ad Hoc Networks,"* **IEEE Communications Magazine**, vol. 48, no. 6, pp. 129-135, June 2010.

18) B. Atakan, and O. B. Akan, *"Distributed Audio Sensing with Homeostasis-inspired Autonomous Communication,"* **Ad Hoc Networks Journal (Elsevier)**, vol. 9, no. 4, pp. 552-564, June 2011.

19) E. Gul, B. Atakan, and O. B. Akan, *"NanoNS: A Nanoscale Network Simulator Framework for Molecular Communications,"* **Nano Communication Networks (Elsevier)**, vol. 1, no. 2, pp. 138-156, June 2010.

20) B. Atakan, and O. B. Akan, *"Deterministic Capacity of Information Flow in Molecular Nanonetworks,"* **Nano Communication Networks (Elsevier)**, vol. 1, no. 1, pp. 31-42, March 2010.

Book Chapters

1) B. Atakan, O. B. Akan, *"Immune System Based Energy Efficient and Reliable Communication in Wireless Sensor Networks,"* **Advances in Biologically Inspired Information Systems**, Edited by F. Dressler and I. Carreras, Springer, 2007.

2) B. Atakan, T. Tugcu, O. B. Akan, *"Bio-inspired Communications in Wireless Sensor Networks,"* **Handbook of Wireless Sensor and Ad Hoc Networks**, Edited by S. Misra, I. Woungang, and S. C. Misra, Springer (London), 2008.

3) B. Atakan, O. B. Akan, *"Biologically-inspired Dynamic Spectrum Access in Cognitive Radio Networks,"* **Bio-inspired Computing and Communication Networks**, Edited by Y. Xiao and F. Hu, , Auerbach Publications, CRC Press, 2008.

4) B. Atakan, and O. B. Akan, *"On Channel Capacity and Error Compensation in Molecular Communication,"* **Springer Transaction on Computational System Biology**, Part of the Lecture Notes in Computer Science book series (LNCS, volume 5410), pp. 59-80, December 2008.

Conference Papers

1) F. Güleç, B. Atakan, *"Localization of a passive molecular transmitter with a sensor network"* in **Proceedings of International Conference on Bio-inspired Information and Communication Technologies**, Springer, Cham, 2020.

2) A. Al-Qamaji, B. Atakan, *"On exploiting spatial correlation for energy harvesting wireless sensor networks,"* in **Proceedings of 25th Signal Processing and Communications Applications Conference (SIU)**, pp. 1-4, Antalya, Turkey, May, 2017.

3) B. Atakan, O. B. Akan, *"An Information Theoretical Approach for Molecular Communication,"* in **Proceedings of IEEE/ACM Bionetics 2007**, Budapest, Hungary, December, 2007.

4) B. Atakan, O. B. Akan, *"Biologically-inspired spectrum sharing in cognitive radio networks,"* in **Proceedings of IEEE WCNC 2007**, pp. 43-48, 2007.

5) B. Atakan, O. B. Akan, *"On Molecular Multiple-Access, Broadcast, and Relay Channels in Nanonetworks,"* in **Proceedings of ICST/ACM Bionetics 2008**, Hyogo, Japan, November 2008.

6) B. Atakan, O. B. Akan, *"Immune System Based Distributed Node and Rate Selection in Wireless Sensor Networks,"* in **Proceedings of IEEE/ICST Bionetics 2006**, Italy, December 2006.

7) B. Atakan, O. B. Akan, *"Single and Multiple-Access Channel Capacity in Molecular Nanonetworks,"* in **Proceedings of ICST/ACM Nano-Net 2009**, Luzern, Switzerland, October 2009.

8) B. Atakan, O. B. Akan, *"Carbon Nanotube Sensor Networks,"* in **Proceedings of IEEE Nanocom 2009**, San Francisco, USA, August 2009.

9) B. Atakan, O. B. Akan, *"On Event Signal Reconstruction in Wireless Sensor Networks,"* in **Proceedings of IFIP/TC6 Networking 2007**, Atlanta, GA, May 2007.

10) B. Atakan, B. Gulbahar, O. B. Akan, *"Immune System-inspired Evolutionary Opportunistic Spectrum Access in Cognitive Radio Ad Hoc Networks,"* in **Proceedings of IFIP/IEEE Med-Hoc-Net 2010**, pp. 1-8, Juan-les-pins, France, June 2010.

11) B. Atakan, A. M. Erkmen, I. Erkmen, *"3-D Grasping During Serpentine Motion with a Snake-like Robot,"* in **Proceedings of IASTED International Conference on Robotics and Applications 2005**, Cambridge USA.

COURSES TAUGHT

- EE564 - Bio-Inspired Multi-Scale Communications
- EE544 - Information Theory and Coding
- EE352 - Communication Systems I
- EE451 - Communication Systems II
- EE442 - Computer Networks
- EE453 - Software-Defined Communications
- EE491 - Graduation Project I
- EE492 - Graduation Project II

TECHNICAL ACTIVITIES

- **Guest Editor** in Digital Signal Processing (Elsevier), Special Issue on Signal Processing Aspects of Molecular Communications
- **Guest Editor** in MDPI Sensors Journal, Special Issue on Advanced Applications of WSNs and IoT
- **Associate Editor** in Frontiers in Communications and Networks within specialty section of Non-Conventional Communications and Networks
- **Technical Program Committee Member** for various conferences and workshops like IEEE MoNaCom, IEEE ISCC
- **Reviewer** for various journals like IEEE Journal on Selected Areas in Communications, IEEE Transactions on Signal Processing, IEEE Communication Letters