

CONTACT INFORMATION University of Southern California, Ming Hsieh Department of Electrical and Computer Engineering, Los Angeles, CA *E-mail:* mgursoy@usc.edu
Telephone: +1 323 998 3895

RESEARCH INTERESTS Communication theory & systems, molecular communications, information theory, queueing theory

EDUCATION **University of Southern California**, Los Angeles, CA, USA *August 2019 - Present*
Ph.D. student in Electrical Engineering, CGPA: 3.94/4.0
Advised by Prof. Urbashi Mitra.

University of Wisconsin, Madison, Madison, WI, USA *June 2022 - July 2022*
Visiting Researcher,
Lab PI Prof. Ophelia Venturelli.

Bogazici University, Istanbul, Turkey *January 2018 - August 2019*
Ph.D. student in Electrical and Electronics Engineering, CGPA: 4.0/4.0
Advised by Prof. Ali Emre Pusane.

Bogazici University, M.Sc., Istanbul, Turkey *September 2015 - January 2018*
M.Sc. student in Electrical and Electronics Engineering, CGPA: 3.69/4.0
Advised by Prof. Ali Emre Pusane.

Thesis Topic: *Multiple User and Channel Interference Reduction Methods for Molecular Communication via Diffusion Systems*

Bogazici University, B.Sc., Istanbul, Turkey *2011 - 2015*
B.Sc. student in Electrical and Electronics Engineering, CGPA: 3.47/4.0
Project Topic: *Introducing a Realistic Simulation Tool for Molecular Communication via Diffusion Systems*

PUBLICATIONS AND RESEARCH EXPERIENCE **Journal Papers**

1. **M. C. Gursoy** and U. Mitra, "Packet scheduling under two-sided individual delay constraints", *IEEE Transactions on Communications*, to be submitted.
2. **M. C. Gursoy**, M. Nasiri-Kenari, and U. Mitra, "Towards High Data-Rate Diffusive Molecular Communications: A review Performance Enhancement Strategies", *Elsevier Digital Signal Processing*, vol. 124, pp. 103161, May 2022.
3. **M. C. Gursoy** and U. Mitra, "Higher Order Derivative-Based Receiver Pre-processing for Molecular Communications", *accepted to IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, Feb. 2022.
4. **M. C. Gursoy**, D. Seo, and U. Mitra, "A Concentration-Time Hybrid Modulation Scheme for Molecular Communications", *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, vol. 7, no. 4, pp. 288-299, Dec. 2021.

5. **M. C. Gursoy**, H. B. Yilmaz, A. E. Pusane, and T. Tugcu, "Simulation study and analysis of diffusive molecular communications with an apertured plane", *IEEE Transactions on NanoBioscience*, vol. 19, no. 3, pp. 468-476, July 2020.
6. **M. C. Gursoy**, A. Celik, E. Basar, A. E. Pusane, and T. Tugcu, "Molecular Index Modulation with Space-Time Equalization", *IEEE Wireless Communications Letters*, vol. 9, no. 5, pp. 702-705, May 2020.
7. O. D. Kose, **M. C. Gursoy**, M. Saraclar, A. E. Pusane, and T. Tugcu, "Machine learning-based silent entity localization using molecular diffusion", *IEEE Communications Letters*, vol. 24, no. 4, pp. 807-810, Apr. 2020.
8. **M. C. Gursoy**, E. Basar, A. E. Pusane, and T. Tugcu, "Index Modulation for Molecular Communication via Diffusion Systems", *IEEE Transactions on Communications*, vol. 67, no. 5, pp. 3337-3350, May 2019.
9. **M. C. Gursoy**, E. Basar, A. E. Pusane, and T. Tugcu, "Pulse Position-Based Spatial Modulation for Molecular Communications", *IEEE Communications Letters*, vol. 23, no. 4, pp. 596-599, Apr. 2019.
10. **M. C. Gursoy**, A. E. Pusane, and T. Tugcu, "Molecule-as-a-Frame: A frame based communication approach for nanonetworks", *Elsevier Nano Communications Networks*, vol. 16, pp. 45-59, June 2018.

Conference Papers

1. **M. C. Gursoy**, S. Gupta, O. S. Venturelli, and U. Mitra, "Optimizing the Spatial Topology of Bacterial Relay Systems: Delay Minimization", in *Proc. IEEE International Conference on Communications (ICC)*, Seoul, South Korea, May 2022.
2. **M. C. Gursoy** and U. Mitra, "On the optimization of derivative-based receivers for molecular communications", in *Proc. ACM NanoCom*, virtual, Sept. 2021.
3. **M. C. Gursoy** and U. Mitra, "Higher Order Derivatives: Improved Pre-Processing and Receivers for Molecular Communications", in *Proc. IEEE Global Communications Conference (GLOBECOM)*, Taipei, Taiwan, Dec. 2020.
4. **M. C. Gursoy**, D. Seo, and U. Mitra, "Concentration and Position-Based Hybrid Modulation Scheme for Molecular Communications", in *Proc. International Conference on Communications (ICC)*, Dublin, Ireland, June 2020.
5. A. Celik, **M. C. Gursoy**, E. Basar, A. E. Pusane, and T. Tugcu, "A Low-Complexity Solution to Angular Misalignments in Molecular Index Modulation", in *Proc. Personal, Indoor and Mobile Radio Communications (PIMRC)*, Istanbul, Turkey, Sept. 2019.
6. **M. C. Gursoy**, E. Basar, A. E. Pusane, and T. Tugcu, "An ILI Mitigating Modulation Scheme for Molecular MIMO Communications", in *Proc. International Conference on Telecommunications and Signal Processing (TSP)*, Budapest, Hungary, July 2019.

7. **M. C. Gursoy**, H. B. Yilmaz, A. E. Pusane, and T. Tugcu, "Performance Enhancement of Diffusive Molecular Communications with an Apertured Plane", in *Workshop on Molecular Communications*, Linz, Austria, Apr. 2019.
8. **M. C. Gursoy**, B. C. Akdeniz, A. E. Pusane, and T. Tugcu, "Error Probability Calculation with Reduced Complexity for Molecular Communications", in *Proc. International Conference on Telecommunications and Signal Processing (TSP)*, Athens, Greece, July 2018.
9. **M. C. Gursoy**, A. E. Pusane, and T. Tugcu, "Superposition Based Molecular Communications in Nanomachine Swarms", in *Proc. IEEE Signal Processing and Communications Applications Conference (SIU)*, Izmir, Turkey, May 2018.
10. B. C. Akdeniz, **M. C. Gursoy**, A. E. Pusane, and T. Tugcu, "On the performance of the modulation Methods in time-varying molecular communication channels", in *Proc. International Conference on Telecommunications and Signal Processing (TSP)*, Barcelona, Spain, July 2017.
11. **M. C. Gursoy**, A. E. Pusane, and T. Tugcu, "Throughput optimization for molecule-as-a-frame communications", in *Proc. IEEE Intl. Black Sea Conference on Communications and Networking (BlackSeaCom)*, Istanbul, Turkey, June 2017.
12. **M. C. Gursoy**, B. C. Akdeniz, A. E. Pusane, and T. Tugcu, "On the effects of mobile transmitter and receiver on the performance of molecular communications system", in *Proc. IEEE Signal Processing and Communications Applications Conference (SIU)*, Antalya, Turkey, May 2017.

PEER-
REVIEWING

Journals

IEEE Communications Magazine
 IEEE Communications Letters
 IEEE Transactions on Communications
 IEEE Transactions on Molecular, Biological, and Multi-Scale Communications
 IEEE Transactions on Signal Processing
 IEEE Transactions on Vehicular Technology
 IEEE Wireless Communications Letters
 Elsevier Digital Signal Processing
 Elsevier Nano Communication Networks
 Elsevier Physical Communication

Conferences

IEEE ICC
 IEEE GLOBECOM

MENTORED
STUDENTS

- **Shivani Dhok:** Student intern from Visvesvaraya National Institute of Technology, Nagpur, India, under the IUSSTF-Viterbi program (Summer 2022)
- **Ahmet Celik:** Supervised master's student from Istanbul Technical University, Istanbul, Turkey (2019-2020)

COMPLETED
COURSEWORK

University of Southern California

- EE503 Probability for Electrical and Computer Engineers
- EE510 Linear Algebra for Engineering
- EE535 Wireless Communications
- EE562 Random Processes in Engineering
- EE563 Estimation Theory
- EE565 Information Theory and Its Application to (Big) Data Science
- EE588 Optimization for the Information and Data Sciences
- MATH425A Fundamental Concepts of Analysis
- MATH505B Applied Probability
- MATH547 Mathematical Foundations of Statistical Learning Theory
- PHYS444 Physical Biology: From Molecules to Cells

TEACHING
EXPERIENCE

Research and Teaching Assistant, Bogazici University,

Istanbul, Turkey

Department of Electrical and Electronics Engineering.

December 2015 - August 2019

Assisted courses include:

- EE201 Electrical Circuits I *Spring 2016-2019*
- EE241 Computer Tools for EE (MATLAB programming.) *Fall 2016*
- EE242 Numerical Methods for EE (C++ programming.) *Spring 2016-2019*
- EE437 Op Amps and Applications *Fall 2016*
- EE473 Introduction to Digital Signal Processing *Fall 2017*
- EE479 Communications Laboratory *Fall 2017, 2018*
- EE577 Statistical Signal Analysis *Fall 2018*

COMPUTER
SKILLS

MATLAB, C, C++, Python, LabView, VHDL, Xilinx ISE, SPICE, L^AT_EX.

LANGUAGE
SKILLS

Turkish (*Native*)

English (*Full Professional Proficiency - latest TOEFL iBT Score: 112*)