

HUSEYIN UGUR YILDIZ, PH.D.

ASSOCIATE PROFESSOR OF ELECTRICAL ENGINEERING | IEEE SENIOR MEMBER | OPERATIONS RESEARCH

· NETWORK OPTIMIZATION · ML/RL | WIRELESS, UNDERWATER & AERIAL NETWORKS

📞 +90 (312) 585 02 21 | 📩 hugur.yildiz@edu.edu.tr | 💬 [huguryildiz](https://www.linkedin.com/in/huguryildiz/) | 🌐 huguryildiz.com | 🌐 Ankara, Turkey

👤 SUMMARY

Associate Professor of Electrical and Electronics Engineering with a Ph.D. specializing in operations research and optimization for wireless, underwater, and aerial communication systems. Over 10 years of research experience, I develop mathematical optimization models for routing, resource allocation, reliability, and energy efficiency across complex networked systems, integrating reinforcement learning techniques for dynamic and large-scale environments. My current interests include hybrid optimization–learning methodologies for next-generation network paradigms, including quantum communication systems. I have authored 40+ peer-reviewed journal and conference publications and actively serve as editor, reviewer, and TPC member. I also teach probability, signals and systems, and communication networks, contributing to curriculum development, accreditation, and academic leadership.

💻 PROFESSIONAL EXPERIENCE

TED University

Ankara, Turkey

Associate Professor of Electrical and Electronics Engineering

03/2021 – Present

Chair of the Electrical and Electronics Engineering Department

07/2021 – 07/2024

Assistant Professor of Electrical and Electronics Engineering

09/2016 – 03/2021

- Conducted research on network flow-based optimization to enhance wireless sensor network performance; authored 20+ peer-reviewed publications, including 14 articles in IEEE journals.
- Led academic operations for 100+ students and 12 faculty members; oversaw accreditation and curriculum, established a new teaching laboratory, launched an M.Sc. program, and founded the IEEE Student Branch.
- Taught undergraduate and graduate courses in communications, signal processing, and probability using active learning methodologies; mentored 40+ senior design teams and supervised 7 graduate theses.

Turkish Aerospace

Ankara, Turkey

Avionics Design Engineer, Unmanned Aerial Vehicles

12/2015 – 08/2016

- Involved in development and integration of network architectures for the ANKA UAV program; built and configured UAV network infrastructure and designed high-availability Cisco systems ensuring 24/7 readiness.

Turk Telekom

Ankara, Turkey

Senior Network Engineer, Deep Packet Inspection

12/2010 – 11/2015

- Contributed to design and operation of the Safer Internet Service, a nationwide content-filtering platform serving 5M+ users; managed 100+ Cisco/Procera DPI systems, ensuring 99.9% uptime and regulatory compliance.

🎓 EDUCATION

TOBB University of Economics and Technology (ETU)

Ankara, Turkey

Ph.D., Electrical and Electronics Engineering

01/2014 – 04/2016

Dissertation Title: Transmission power control for link-level handshaking in wireless sensor networks

TOBB University of Economics and Technology

Ankara, Turkey

M.Sc., Electrical and Electronics Engineering

09/2011 – 09/2013

Thesis Title: Commun./comput. trade-offs in WSNs: Comparing network-level and node-level strategies

Bilkent University

Ankara, Turkey

B.Sc., Electrical and Electronics Engineering

08/2005 – 08/2009

⚙️ TECHNICAL SKILLS

- Optimization & Operations Research:** Linear Programming (LP), Mixed-Integer Programming (MIP), Multi-Objective Optimization, Network Flow Programming, Constraint Programming, Metaheuristics; GAMS, Gurobi, CPLEX, XPRESS, PuLP, Pyomo.

- **Machine Learning & Reinforcement Learning:** Supervised and Unsupervised Learning, Regression and Classification Models, Decision Trees, Neural Networks, Markov Decision Processes (MDPs), Q-Learning, Proximal Policy Optimization (PPO), Deep Reinforcement Learning.
- **Programming & Scientific Computing:** Python (NumPy, Pandas, Scikit-Learn, Matplotlib), MATLAB/Octave, Simulink, L^AT_EX.
- **Development Tools:** PyCharm, Jupyter Notebook, VS Code, Spyder, Cursor.

CERTIFICATES

- **Machine Learning Specialization**, DeepLearning.AI – Coursera, 2025 ([Credential](#))
- **Deep Learning Specialization**, DeepLearning.AI – Coursera, 2025 ([Credential](#))
- **Reinforcement Learning Specialization**, University of Alberta – Coursera, 2025 ([Credential](#))

SOFT SKILLS

Leadership, Team Management, Communication & Collaboration, Problem-Solving, Decision-Making, Mentoring, Teaching, Adaptability, Time Management

HONORS & AWARDS

[A2] **Elevation to the IEEE Senior Member grade**, an honor recognizing significant contributions to the profession (achieved by less than 10% of IEEE members), 2021.

[A1] **The best paper award (3rd place)**, “*Utilization of multi-sink architectures for lifetime maximization in underwater sensor networks*,” 2nd IEEE Middle East & North Africa Communications Conference (MENA-COMM’19), Manama, Bahrain, 2019.

RESEARCH AREAS

Wireless Ad Hoc and Sensor Networks, Underwater Acoustic Sensor Networks, Internet of Things, Drone Networks, Smart Grids, Operations Research, Metaheuristics, Neural Networks, Reinforcement Learning.

PUBLICATIONS

(1) Journal Articles:

[J24] Tantur Karagul, C., Akgun, M. B., **Yildiz, H. U.**, & Tavli, B. (2025). Mitigating energy cost of connection reliability in UWSNs through non-uniform k-connectivity. *IEEE Internet of Things Journal*, 12 (22), 47817–47826.

[J23] Asci, M., Akusta Dagdeviren, Z., Akram, V. K., **Yildiz, H. U.**, Dagdeviren, O., & Tavli, B. (2025). Enhancing drone network resilience: Investigating strategies for k-connectivity restoration. *Computer Standards & Interfaces*, 92, 103941.

[J22] Gultekin, B., Nurcan-Atceken, D., Altin-Kayhan, A., **Yildiz, H. U.**, & Tavli, B. (2023). Exploring the tradeoff between energy dissipation, delay, and the number of backbones for broadcasting in wireless sensor networks through goal programming. *Ad Hoc Networks*, 149, 103223.

[J21] **Yildiz, H. U.** (2023). Joint effects of void region size and sink architecture on underwater WSNs lifetime. *IEEE Sensors Journal*, 23(10), 11046-11056.

[J20] Cobanlar, M., **Yildiz, H. U.**, Akram, V. K., Dagdeviren, O., & Tavli, B. (2022). On the tradeoff between network lifetime and k-connectivity-based reliability in UWSNs. *IEEE Internet of Things Journal*, 9(23), 24444-24452.

[J19] Carsancakli, M. F., Al Imran, M. A., **Yildiz, H. U.**, Kara, A., & Tavli, B. (2022). Reliability of linear WSNs: A complementary overview and analysis of impact of cascaded failures on network lifetime. *Ad Hoc Networks*, 131, 102839.

[J18] Tekin, N., **Yildiz, H. U.**, & Gungor, V. C. (2021). Node-level error control strategies for prolonging the lifetime of wireless sensor networks. *IEEE Sensors Journal*, 21(13), 15386-15397.

[J17] **Yildiz, H. U.**, Kurt, S., & Tavli, B. (2019). Comparative analysis of transmission power level and packet size optimization strategies for WSNs. *IEEE Systems Journal*, 13(3), 2264-2274.

- [J16] Yildiz, H. U. (2019). Maximization of underwater sensor networks lifetime via fountain codes. *IEEE Transactions on Industrial Informatics*, 15(8), 4602-4613.
- [J15] Akbas, A., Yildiz, H. U., Ozbayoglu, A. M., & Tavli, B. (2019). Neural network-based instant parameter prediction for wireless sensor network optimization models. *Wireless Networks*, 25(6), 3405–3418.
- [J14] Erdem, H. E., Yildiz, H. U., & Gungor, V. C. (2019). On the lifetime of compressive sensing based energy harvesting in underwater sensor networks. *IEEE Sensors Journal*, 19(12), 4680-4687.
- [J13] Sayit, M., Cetinkaya, C., Yildiz, H. U., & Tavli, B. (2019). DASH-QoS: A scalable network layer service differentiation architecture for DASH over SDN. *Computer Networks*, 154, 12-25.
- [J12] Yildiz, H. U. (2019). Investigation of maximum lifetime and minimum delay trade-off in underwater sensor networks. *International Journal of Communication Systems*, 32(7), e3924.
- [J11] Yildiz, H. U., Gungor, V. C., & Tavli, B. (2019). Packet size optimization for lifetime maximization in underwater acoustic sensor networks. *IEEE Transactions on Industrial Informatics*, 15(2), 719-729.
- [J10] Yildiz, H. U. (2018). The impact of transmission power levels set size on lifetime of wireless sensor networks in smart grids. *Turkish Journal of Electrical Engineering & Computer Sciences*, 26(6), 3057-3071.
- [J9] Yigit, M., Yildiz, H. U., Kurt, S., Tavli, B., & Gungor, V. C. (2018). A survey on packet size optimization for terrestrial, underwater, underground, and body area sensor networks. *International Journal of Communication Systems*, 31(11), e3572.
- [J8] Yildiz, H. U., Ciftler, B. S., Tavli, B., Bicakci, K., & Incebacak D. (2018). The impact of incomplete secure connectivity on the lifetime of wireless sensor networks. *IEEE Systems Journal*, 12(1), 1042-1046.
- [J7] Yildiz, H. U., Tavli, B., Kahjogh, B., & Dogdu, E. (2017). The impact of incapacitation of multiple critical sensor nodes on wireless sensor network lifetime. *IEEE Wireless Communications Letters*, 6(3), 306-309.
- [J6] Kurt, S., Yildiz, H. U., Yigit, M., Tavli, B., & Gungor, V. C. (2017). Packet size optimization in wireless sensor networks for smart grid applications. *IEEE Transactions on Industrial Electronics*, 64(3), 2392-2401.
- [J5] Akbas, A., Yildiz, H. U., Tavli, B., & Uludag, S. (2016). Joint optimization of transmission power level and packet size for WSN lifetime maximization. *IEEE Sensors Journal*, 16(12), 5084-5094.
- [J4] Yildiz, H. U., Bicakci, K., Tavli, B., Gultekin, H., & Incebacak, D. (2016). Maximizing wireless sensor network lifetime by communication/computation energy optimization of non-repudiation security service: Node level versus network level strategies. *Ad Hoc Networks*, 37(2), 301-323.
- [J3] Yildiz, H. U., Tavli, B., & Yanikomeroglu, H. (2016). Transmission power control for link-level handshaking in wireless sensor networks. *IEEE Sensors Journal*, 16(2), 561-576.
- [J2] Yildiz, H. U., Temiz, M., & Tavli, B. (2015). Impact of limiting hop count on the lifetime of wireless sensor networks. *IEEE Communications Letters*, 19(4), 569-572.
- [J1] Batmaz, A. U., Yildiz, H. U., & Tavli, B. (2014). Role of unidirectionality and reverse path length on wireless sensor network lifetime. *IEEE Sensors Journal*, 14(11), 3971-3982.

(2) Editorial:

- [E1] Haytaoglu, E., Arslan, S. S., Dagdeviren, O., Yildiz, H. U., & Ozturk, Y. (2025). Editorial brief for special issue: Mass connectivity and/or communication paradigms for the Internet of Things. *Internet of Things*, 32, 101625.

(3) Conference Proceedings:

- [C13] Tantur Karagul, C., Akgun, M. B., Yildiz, H. U., & Tavli, B. (2025, November). Non-uniform k-connectivity for energy-efficient and reliable underwater wireless sensor networks. In *2025 33rd Telecommunication Forum (TELFOR)* (pp. 1-4). IEEE.
- [C12] Un, B., Yildiz, H. U., & Tavli, B. (2021, May). Impact of critical node failures on lifetime of UWSNs with incomplete secure connectivity. In *2021 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom)* (pp. 1-6). IEEE.

- [C11] Ozmen, A., **Yildiz, H. U.**, & Tavli, B. (2020, November). Impact of minimizing the eavesdropping risks on lifetime of underwater acoustic sensor networks. In *2020 28th Telecommunication Forum (TELFOR)* (pp. 1-4). IEEE.
- [C10] **Yildiz, H. U.** (2019, November). Utilization of multi-sink architectures for lifetime maximization in underwater sensor networks. In *2019 2nd IEEE Middle East and North Africa Communications Conference (MENA-COMM)* (pp. 1-5). IEEE.
- [C9] **Yildiz, H. U.** (2019, October). Prolonging the lifetime of underwater sensor networks under sinkhole attacks. In *The 14th ACM International Conference on Underwater Networks & Systems (WUWNet)* (pp. 1-5). ACM.
- [C8] **Yildiz, H. U.**, Gungor, V. C., & Tavli, B. (2018, June). A hybrid energy harvesting framework for energy efficiency in wireless sensor networks based smart grid applications. In *2018 17th Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net)* (pp. 1-6). IEEE.
- [C7] Dagdeviren, O., Akram, V. K., Tavli, B., **Yildiz, H. U.**, & Atilgan, C. (2016, October). Distributed detection of critical nodes in wireless sensor networks using connected dominating set. In *2016 IEEE SENSORS* (pp. 1-3). IEEE.
- [C6] Tantur, C., **Yildiz, H. U.**, Kurt, S., & Tavli, B. (2016, October). Optimal transmission power level sets for lifetime maximization in wireless sensor networks. In *2016 IEEE SENSORS* (pp. 1-3). IEEE.
- [C5] **Yildiz, H. U.**, & Tavli, B. (2015, December). Prolonging wireless sensor network lifetime by optimal utilization of compressive sensing. In *2015 IEEE Globecom Workshops (GC Wkshps) on Networking and Collaboration Issues for the Internet of Everything (ONIoE)* (pp. 1-6). IEEE.
- [C4] **Yildiz, H. U.**, & Tavli, B. (2014, December). The impact of random power assignment in handshaking on wireless sensor network lifetime. In *2014 IEEE Globecom Workshops (GC Wkshps) on Management of Emerging Networks and Services (MENS)* (pp. 201-206). IEEE.
- [C3] **Yildiz, H. U.**, Kurt, S., & Tavli, B. (2014, October). The impact of near-ground path loss modeling on wireless sensor network lifetime. In *2014 IEEE Military Communications Conference (MILCOM)* (pp. 1114-1119). IEEE.
- [C2] Akbas, A., **Yildiz, H. U.**, & Tavli, B. (2014, May). Data packet length optimization for wireless sensor network lifetime maximization. In *2014 10th International Conference on Communications (COMM)* (pp. 1-6). IEEE.
- [C1] **Yildiz, H. U.**, Bicakci, K., & Tavli, B. (2014, January). Communication/computation trade-offs in wireless sensor networks: Comparing network-level and node-level strategies. In *2014 IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet)* (pp. 49-51). IEEE.
- (4) Conference Proceedings (in Turkish):**
- [CT5] **Yildiz, H. U.** (2019, April). Improvement of underwater acoustic sensor network performance with fountain codes. In *2019 27th Signal Processing and Communications Applications Conference (SIU)* (pp. 1-4). IEEE.
- [CT4] **Yildiz, H. U.** (2018, November). Minimum delay and maximum lifetime trade-off in underwater sensor networks. In *2018 National Conference on Electrical, Electronics and Biomedical Engineering (ELECO)* (pp. 80-83). EMO.
- [CT3] Karakurt, Y., **Yildiz, H. U.**, & Tavli, B. (2018, May). The impact of mitigation of eavesdropping on wireless sensor network lifetime. In *2018 26th Signal Processing and Communications Applications Conference (SIU)* (pp. 1-4). IEEE.
- [CT2] **Yildiz, H. U.** (2018, May). The impact of data fragmentation on network lifetime in underwater acoustic sensor networks. In *2018 26th Signal Processing and Communications Applications Conference (SIU)* (pp. 1-4). IEEE.
- [CT1] **Yildiz, H. U.**, Tavli, B., & Kahjogh, B. O. (2017, May). Assessment of wireless sensor network lifetime reduction due to elimination of critical node sets. In *2017 25th Signal Processing and Communications Applications Conference (SIU)* (pp. 1-4). IEEE.

CITATIONS

- Total Google Scholar Citations > 1K, • h-index: 15

PROFESSIONAL ACTIVITIES AND SERVICE

(1) Technical Program Committee Member:

- IEEE International Conference on Communications (ICC 2018–2022),
- IEEE Wireless Communications and Networking Conference (WCNC 2019, WCNC 2021–2025),
- International Balkan Conference on Communications and Networking (BalkanCom 2023–2025),
- Int. Conf. on Innovation and Intelligence for Information, Computation, and Technology (3ICT'19, 3ICT'20),
- Int. Conference on Network and Service Management (CNSM 2020, CNSM 2021),
- 2nd IEEE Middle East and North Africa Communications Conference (MENACOMM'19),
- International Conference on Underwater Networks & Systems (WUWNet 2019–2025),
- 2018 IEEE 87th Vehicular Technology Conference (VTC2018-Spring),
- 2018 IEEE INFOCOM'18 Workshop on Wirel. Commun. and Netw. in Extreme Environ.,
- IEEE SENSORS 2017.

(2) Reviewer:

- Ad Hoc Networks, • Computer Networks, • IEEE Access, • IEEE Communication Letters, • IEEE Communications Surveys and Tutorials, • IEEE International Conference on Communications, • IEEE Int. Conf. on Wireless and Mobile Computing, Networking and Commun. (WiMob 2016), • IEEE International Symposium on Personal, Indoor, and Mobile Radio Commun. (PIMRC 2017), • IEEE Internet of Things Journal, • IEEE Sensors Journal, • IEEE Systems Journal, • IEEE Wireless Communications and Networking Conference (WCNC 2018-2024), • IEEE Transactions on Cybernetics, • IEEE Transactions on Industrial Electronics, • IEEE Transactions on Industrial Informatics, • IEEE Transactions on Mobile Computing, • IEEE Wireless Communications Letters,

(3) Session Chair:

- “PHY-II: Physical Layer Communications-II” – 2021 IEEE BlackSeaCom,
- “Underwater Networking” – 2019 14th Int. Conf. on Underwater Networks & Systems (WUWNet'19),
- “Communication Networks II” – 2018 26th Signal Proc. and Commun. Appl. Conference (SIU),
- “Sensor Network, Method & Evaluation” – IEEE SENSORS 2016,
- “Management of Emerging Networks” – 2014 IEEE GLOBECOM Workshop on Management of Emerging Netw..

COURSES TAUGHT

(1) TED University:

- EE 205 – Software Tools for Electrical Engineering (Fall'16),
- EE 304 – Probability and Random Variables (Spring'17 – Present),
- EE 311 – Signals and Systems (Fall'16 – Present),
- EE 312 – Communication Systems I (Spring'17, Spring'18),
- EE 413 – Communication Systems II (Fall'16 – Present),
- EE 462 – Power System Analysis (Spring'17).
- EE 512 – Optimization for Communication Networks (Spring'26).

SEMINARS AND INVITED TALKS

Yildiz, H. U. (2019, October 24). *Prolonging the lifetime of underwater sensor networks under sinkhole attacks* [Invited talk]. Georgia Institute of Technology, Atlanta, GA, United States. Hosted by I. F. Akyildiz.

Yildiz, H. U. (2019, April 25). *Maximization of underwater sensor networks lifetime via fountain codes* [Conference presentation]. Next Generation Communication Techniques and Applications (Special Session), 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey.

Yildiz, H. U. (2019, February 19). *Maximization of underwater sensor networks lifetime via fountain codes* [Invited talk]. ASELSAN Information and Communication Technologies Workshop, Ankara, Turkey.

Yildiz, H. U. (2016, November 14). *Optimal transmission power level sets for lifetime maximization in wireless sensor networks* [Invited talk]. ASELSAN Information and Communication Technologies Workshop, Ankara, Turkey.

Yildiz, H. U. (2014, December 3). *The impact of random power assignment in handshaking on wireless sensor network lifetime* [Invited talk]. The University of Texas at Dallas, Dallas, TX, United States. Hosted by M. Torlak.

Yildiz, H. U. (2014, February 11). *Transmission power control for link-level handshaking in wireless sensor networks* [Invited talk]. University of Rochester, Rochester, NY, United States. Hosted by W. Heinzelman.

Yildiz, H. U. (2014, February 7). *Transmission power control for link-level handshaking in wireless sensor networks* [Invited talk]. University at Buffalo, Buffalo, NY, United States. Hosted by T. Melodia.

Yildiz, H. U. (2014, February 5). *A seminar on wireless sensor networks, network optimization, and mathematical programming* [Invited seminar]. Carleton University, Ottawa, ON, Canada. Hosted by H. Yanikomeroglu.

Yildiz, H. U. (2014, January 23). *Transmission power control for link-level handshaking in wireless sensor networks* [Invited talk]. University of Southern California, Los Angeles, CA, United States. Hosted by B. Krishnamachari.

Yildiz, H. U. (2014, January 22). *Transmission power control for link-level handshaking in wireless sensor networks* [Invited talk]. University of California, Irvine, CA, United States. Hosted by E. Ayanoglu.

THESES SUPERVISED

[TH7] Tantur Karagul, C. (2025). *Network lifetime optimization in underwater wireless sensor networks with variable k-connectivity* (Doctoral dissertation). TOBB University of Economics and Technology, Ankara, Turkey.

[TH6] Cobanlar, M. (2022). *Analysis of the trade-off between network lifetime and k-connectivity in wireless sensor networks* (Doctoral dissertation). TOBB University of Economics and Technology, Ankara, Turkey.

[TH5] Un, B. E. (2021). *Design of a novel optimization framework for analyzing the impact of critical nodes on the network lifetime of underwater acoustic sensor networks using private key cryptography* (Master's thesis). TOBB University of Economics and Technology, Ankara, Turkey.

[TH4] Aydin, C. (2021). *Network lifetime maximization in underwater wireless sensor networks based on the number of depleted nodes* (Master's thesis). TOBB University of Economics and Technology, Ankara, Turkey.

[TH3] Ozmen, A. (2021). *Modeling the trade-off between eavesdropping and network lifetime using a mixed-integer programming approach in underwater acoustic sensor networks* (Master's thesis). TOBB University of Economics and Technology, Ankara, Turkey.

[TH2] Karakurt, Y. (2018). *Eavesdropping potential in wireless sensor networks and modeling and analysis of network lifetime recovery* (Master's thesis). TOBB University of Economics and Technology, Ankara, Turkey.

[TH1] Tantur, C. (2017). *Optimal transmission power level sets for lifetime maximization in wireless sensor networks* (Master's thesis). TOBB University of Economics and Technology, Ankara, Turkey.

LANGUAGES

- **English:** Business and academic proficiency.
- **Turkish:** Native.

PROFESSIONAL MEMBERSHIPS

- IEEE Senior Member (2021–Cont.), IEEE Commun. Society (2015–2018), IEEE Oceanic Society (2021).