

BARIŞ NAKİBOĞLU

Dep. of Electrical and Electronics Engineering
Middle East Technical University
06800, Ankara, Turkey

Office :C-207
Phone :+90 312 210 44 05
E-mail:bnakib@metu.edu.tr

PROFESSIONAL EXPERIENCE

Middle East Technical University, Ankara, Turkey November 2018-Present
• Assistant Professor at Department of Electrical and Electronics Engineering

Oracle America, Redwood Shores, CA October 2013-January 2014
• Senior Member of Technical Staff in the Fusion Middleware Group: Software testing

University of California, Berkeley, CA October 2012- September 2013
• Postdoctoral Researcher.

TÜBİTAK-BİLTEN (now known as TÜBİTAK-UZAY), Ankara, Turkey
Information Technologies and Electronics Research Institute September 2002-July 2003
• Participated in the design of radio frequency (X-Band) power amplifier for a satellite communication system: conducted software simulations, experiments on the hardware.

EDUCATION

Ph.D. in Electrical Engineering September 2005 - February 2011
Massachusetts Institute of Technology (MIT), Cambridge, MA
GPA: 4.8/5.0
Thesis: “Exponential Bounds on Error Probability with Feedback”

M.Sc. in Electrical Engineering and Computer Science September 2003 - September 2005
Massachusetts Institute of Technology (MIT), Cambridge, MA
GPA: 4.9/5.0
Thesis: “Variable Block Length Coding for Channels with Feedback and Cost Constraints”

B.Sc. in Electrical and Electronics Engineering and in Physics September 1998 - June 2002
Middle East Technical University (METU), Ankara, TURKEY
GPA: 3.99/4.00 (EEE Major), 4.00/4.00 (Physics Major)
1st rank in EEE Department, 2nd rank in University

AWARDS

Research Encouragement Award
METU Prof. Dr. Mustafa N. Parlar Foundation December 2019

Young Scientist Awards Program (BAGEP)
The Science Academy, Turkey April 2019

Bronze Medal, with 62nd rank
29th International Physics Olympiad (IPhO), Reykjavik, Iceland July 1998

Bronze Medal in Physics
5th National Science Olympiad, Ankara, Turkey December 1997

SUPERVISED THESIS

- 1) M. F. Yıldız, “A decomposition for the tilted channel of the fast fading channels,” M.S. - Master of Science, Middle East Technical University, 2022.
<https://hdl.handle.net/11511/99705>
- 2) M. E. Şen, “The Cauchy-Schwarz divergence and entropy-based density-weighted active learning,” M.S. - Master of Science, Middle East Technical University, 2022.
<https://hdl.handle.net/11511/99757>

PROJECTS

- 1) “Renyi/Augustin Information Measures and Augustin’s Method For Sphere Packing Bound,” Project Number: 119E053 (3501), 08/2019-02/2022.

PUBLICATIONS

Articles Under Review

- i) B. Nakiboğlu and H.-C. Cheng, “The Mutual Information In The Vicinity of Capacity-Achieving Input Distributions,” *Submitted to IEEE Transactions on Information Theory* June 2023.
DOI:10.48550/arXiv.2304.14219

Journal Articles

- J1. B. Nakiboğlu, “The Sphere Packing Bound For Memoryless Channels,” *Problems of Information Transmission* 56(3), pp.201-244, July 2020.
DOI:10.1134/S0032946020030011, 10.31857/S0555292320030018, 10.48550/arXiv.1804.06372
- J2. B. Nakiboğlu, “A Simple Derivation of the Refined Sphere Packing Bound Under Certain Symmetry Hypotheses,” *Turkish Journal of Mathematics* 44(3), pp.919-948, May 2020.
DOI:10.3906/mat-1912-106, 10.48550/arXiv.1904.12780
- J3. B. Nakiboğlu, “The Augustin Capacity and Center,” *Problems of Information Transmission* 55(4), pp.299-342, October 2019.
DOI:10.1134/S003294601904001X, 10.1134/S0555292319040016, 10.48550/arXiv.1803.07937
- J4. B. Nakiboğlu, “The Sphere Packing Bound for DSPCs with Feedback á la Augustin,” *IEEE Transactions on Communications* 67(11), pp.7456-7467, November 2019.
DOI:10.1109/TCOMM.2019.2931302, 10.48550/arXiv.1806.11531
- J5. B. Nakiboğlu, “The Rényi Capacity and Center,” *IEEE Transactions on Information Theory* 65(2), pp.841-860, February 2019.
DOI:10.1109/TIT.2018.2861002, 10.48550/arXiv.1608.02424
- J6. B. Nakiboğlu, “The Sphere Packing Bound via Augustin’s Method,” *IEEE Transactions on Information Theory*, 65(2), pp.816-840, February 2019.
DOI:10.1109/TIT.2018.2882547, 10.48550/arXiv.1611.06924
- J7. B. Nakiboğlu, S. K. Gorantla, L. Zheng, T. P. Coleman, “Bit-wise Unequal Error Protection for Variable Length Block Codes with Feedback,” *IEEE Transactions on Information Theory*, 59(3), pp.1475-1504, March 2013.
DOI:10.1109/TIT.2012.2227671, 10.48550/arXiv.1101.1934
- J8. B. Nakiboğlu, L. Zheng, “Errors-and-Erasures Decoding for Block Codes With Feedback,” *IEEE Transactions on Information Theory*, 58(1), pp.24-49, January 2012.
DOI:10.1109/TIT.2011.2169529, 10.48550/arXiv.0903.4386

- J9. R. G. Gallager, B. Nakiboğlu, “Variations on a theme by Schalkwijk and Kailath,” *IEEE Transactions on Information Theory*, 56(1), pp.6-17, January 2010.
DOI:10.1109/TIT.2009.2034896, 10.48550/arXiv.0812.2709
- J10. S. P. Borade, B. Nakiboğlu, L. Zheng, “Unequal Error Protection: An Information-Theoretic Perspective,” *IEEE Transactions on Information Theory*, 55(12), pp.5511-5539, December 2009.
DOI:10.1109/TIT.2009.2032819, 10.48550/arXiv.0803.2570
- J11. P. Berlin, B. Nakiboğlu, B. Rimoldi, E. İ. Telatar, “A Simple Converse of Burnashev’s Reliability Function,” *IEEE Transactions on Information Theory*, 55(7), pp.3074-3080, July 2009.
DOI:10.1109/TIT.2009.2021322, 10.48550/arXiv.cs/0610145
- J12. B. Nakiboğlu, R. G. Gallager, “Error Exponents for Variable-length Block Codes with Feedback and Cost Constraints,” *IEEE Transactions on Information Theory*, 54(3), pp.945-963, March 2008.
DOI:10.1109/TIT.2007.915913, 10.48550/arXiv.cs/0612097

Conference Papers

- C1. H.-C. Cheng and B. Nakiboğlu, “The Mutual Information In The Vicinity of Capacity-Achieving Input Distributions,” IEEE International Symposium on Information Theory (ISIT), Taipei, Taiwan, June 2023
DOI:10.1109/ISIT54713.2023.10206497
- C2. M. F. Yildız and B. Nakiboğlu, “Augustin Information Measures on Fading Channels Under Certain Symmetry Hypothesis,” IEEE International Symposium on Information Theory (ISIT), Espoo, Finland, June 2022
DOI:10.1109/ISIT50566.2022.9834875
- C3. H.-C. Cheng and B. Nakiboğlu, “On the Existence of the Augustin Mean,” IEEE Information Theory Workshop (ITW), Kanazawa, Japan, October 2021
DOI:10.1109/ITW48936.2021.9611513, 10.48550/arXiv.2109.00443
- C4. H.-C. Cheng and B. Nakiboğlu, “Refined Strong Converse for the Constant Composition Codes,” IEEE International Symposium on Information Theory (ISIT), Los Angeles, California, June 2020
DOI:10.1109/ISIT44484.2020.9174315
- C5. B. Nakiboğlu, “A Simple Derivation of the Refined SPB for the Constant Composition Codes,” IEEE International Symposium on Information Theory, Paris, France, July 2019
DOI:10.1109/ISIT.2019.8849819
- C6. B. Nakiboğlu, “The Augustin center and the sphere packing bound for memoryless channels,” IEEE International Symposium on Information Theory, Aachen, Germany, June 2017
DOI:10.1109/ISIT.2017.8006759, 10.48550/arXiv.1701.06610
- C7. G. Como, B. Nakiboğlu, “Sphere-packing bound for block-codes with feedback and finite memory,” IEEE International Symposium on Information Theory, Austin, Texas, June 2010
DOI:10.1109/ISIT.2010.5513232
- C8. S. K. Gorantla, B. Nakiboğlu, T. P. Coleman, L. Zheng, “Bit-wise unequal error protection for variable length block codes with feedback,” IEEE International Symposium on Information Theory, Austin, Texas, June 2010
DOI:10.1109/ISIT.2010.5513239
- C9. B. Nakiboğlu, L. Zheng, “Upper bounds to error probability with feedback,” 47th Annual Allerton Conference on Communication, Control, and Computing, Monticello, Illinois, Sept 30 - Oct 2 2009
DOI:10.1109/ALLERTON.2009.5394953
- C10. B. Nakiboğlu, L. Zheng, “Upper bounds to error probability with feedback,” IEEE International Symposium on Information Theory, Seoul, Korea, July 2009.
DOI:10.1109/ISIT.2009.5205849
- C11. B. Nakiboğlu, L. Zheng, “Errors-and-erasures decoding for block codes with feedback,” IEEE International Symposium on Information Theory, Toronto, Ontario, July 2008.
DOI:10.1109/ISIT.2008.4595079

- C12. S. P. Borade, B. Nakiboğlu, L. Zheng, "Some fundamental limits of unequal error protection," IEEE International Symposium on Information Theory, Toronto, Ontario, July 2008.
DOI:10.1109/ISIT.2008.4595385
- C13. B. Nakiboğlu, R. G. Gallager, M. Z. Win, "Error exponents for variable-length block codes with feedback and cost constraints," IEEE International Symposium on Information Theory, Seattle, Washington, July 2006.
DOI:10.1109/ISIT.2006.261677
- C14. Ö. Şen, C. Dudak, B. Nakiboğlu, "A two stage solid state power amplifier at x-band for satellite communication," International Conference on Recent Advances in Space Technologies, Istanbul, Turkey, November 2003.
DOI:10.1109/RAST.2003.1303991
- C15. Ö. Şen, C. Dudak, B. Nakiboğlu, "A high efficiency power amplifier at x-band for satellite communication," 21st International Communications Satellite Systems Conference and Exhibit, ICSSC 2003, Yokohama, Japan, April 2003.
DOI:10.2514/6.2003-2386