BARIS YUKSEKKAYA

ASSISTANT PROFESSOR
WIRELESS COMMUNICATIONS RESEARCHER

PERSONAL PROFILE

I am an experienced researcher with a demonstrated history of working in mobile communication systems. I have had experience about building relationships with researchers from different cultures with different expectations and negotiating more practical solutions which are not to be only academic work.

WORK EXPERIENCE

Assistant Professor
Hacettepe University, Turkey | Jul 2019 - present
Dept. Electrical and Electronics Eng.

- Full time lecturer
- Supervising senior and graduate students
- Leading research projects

Teaching and Research Assistant
Hacettepe University, Turkey | Dec 2006 - Jul 2019
Dept. Electrical and Electronics Eng.

- Full time teaching assistantship for undergraduate courses

PostDoc Researcher
Imperial College London, UK | Sep 2016 - May 2017
Dept. Electrical and Electronics Eng.

- Full time researcher working with Prof. Athanassios Manikas and his research team about 5G mm-wave communication systems

Visiting Researcher
Carleton University, Canada | Sep 2013 - Apr 2014
Dept. Systems and Computer Eng.

- Full time researcher working with Prof. Halim Yanikomeroglu and his research team about 4G MIMO communication systems

EDUCATIONAL HISTORY

Hacettepe University, Turkey
Ph.D. in Electrical and Electronics Eng. | Jul 2009 - Feb 2016

- Focus on wireless communication system optimization

Hacettepe University, Turkey
M.Sc. in Electrical and Electronics Eng. | Sep 2006 - Jul 2009

- Focus on transceiver design for OFDM

Hacettepe University, Turkey
B.Sc. in Electrical and Electronics Eng. | Sep 2002 - Jun 2006

- Focus on communications, coding, and signal processing courses

CONTACT ME

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COMPUTER SKILLS

- MATLAB
- C/C++
- Microsoft Office
- Latex

PROFESSIONAL SKILLS

- Interference Management
- System Simulations
- MIMO
- OMA - NOMA Procedures
- PHY and MAC Layers in LTE and NR
- Optimization Theory

LANGUAGE SKILLS

- English
- Turkish

REFERENCES

Prof. Halim Yanikomeroglu
Carleton University Department of Systems and Computer Engineering
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Prof. Cenk Toker
Hacettepe University Department of Electrical and Electronics Engineering
+90 312 7807006
cenk.toker {at} ee.hacettepe.edu.tr

Prof. Athanassios Manikas
Imperial College London Department of Electrical and Electronics Eng.
+44 (0)20 7594 6266
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CURRENT RESEARCH INTERESTS

- Cell Association and Resource Allocation for Ultra Dense HetNets
- Machine Learning Opportunities for Communications
- Massive MIMO Systems
- Drone Communications

RESEARCH EXPERIENCE

Ongoing

- TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey, 119E197, (TL220,574.00), (Project Manager) "**Interference Aware and Fair Cell Association, User Scheduling, and Resource Allocation in Next Generation Ultra Dense Heterogeneous Communication Networks**", November 2019 – November 2021

  It is aimed to investigate and propose original solutions for user-cell association, priority based scheduling, and fair resource allocation problems for next generation ultra-dense heterogeneous communication networks.

- TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey, (TL100,000.00), (Academic Advisor to ULAK INC.) "**The End to End Domestic and National 5G Communication Network Project**", Jun 2020 - Mar 2021

  Providing academic consultancy and developing algorithms on precoding, beam guidance, interference control, resource allocation, and implementation of transmission schemes based on the 5G New Radio standards.

Finished

- Post Doc Research:
  Antenna Array and Array Processing Techniques for Next Generation 5G mm-Wave Communication Systems

  Funded by Hacettepe University Scientific Research Projects Coordination Unit, Turkey, FBI-2016-9815 (TL27,300.00), (Project Manager) "**Antenna Arrays and Array Processing Techniques in Next Generation 5G mm-Wave Communication Systems**", Apr 2016 – Dec 2017

  The main purpose of the research is to obtain characteristics of millimeter-wave (mm-wave) band to be used in 5G systems, performing appropriate channel modelling methods, and applying array processing techniques.

- Ph.D. Research:
  Resource **Allocation and Data Rate Increasing Methods for Next Generation Communication Systems**

  Funded by TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey, 112E024 (TL334,492.00), (Student Researcher) "**Dynamic Radio Resource Management and Allocation for Next Generation Wireless Communications Systems**", Sep 2012 – Oct 2015

  Data rate maximizing power control principles for next generation wireless communication networks are the focus of this project. Optimum power allocation techniques for a two-tier communication network are obtained under interference, transmit power, and fairness constraints and simulations were conducted for SISO-SIMO-MISO-MIMO single carrier and multiple carrier (both OMA and NOMA) scenarios.

Finished Research cont.

- TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey, 108E208, (Student Researcher) “OFDM-Based Resource Allocation in Cooperative Wireless Communications”, January 2009 – August 2011

  A single user relay channel is investigated in terms of outage probability. By using an opportunistic relaying protocol that can switch between direct transmission and decode-and-forward protocols we have found an analytical solution for the minimum outage probability.

- M.Sc. Research:
  A General Framework for Multiuser MIMO Channel Shortening Equalization

  Funded by TUBITAK (The Scientific and Technological Research Council of Turkey), Turkey, 107E056 ($95,000.00) (Student Researcher) “Channel Shortening Equaliser Design and Resource Allocation Algorithm Development for MCM Based Communication Systems”, July 2007 – July 2010

  In a communication scenario between a single base station and multiple users (scenarios like IEEE 802.16 (WiMAX) or xDSL), MU-MISO/SIMO and MU-MIMO scenarios are investigated for joint transmitter-receiver structures that achieve channel shortening equalization. Minimum mean square error (MMSE) criterion is used as a basis for the design of the filters.

- Senior Project:
  Mobile (GSM), Internet and Voice Controlled Wireless Home Automation System

  The main idea of the project is to control the appliances in a smart home using both mobile phones, internet, and voice commands. Throughout the project, I have attended the RF transmitter-receiver design using PIC microcontrollers work package and speech recognition algorithm using time warping method work package.

PUBLICATIONS
(A. JOURNAL PAPER – B. CONFERENCE PROCEEDING)

- A1. Yuksekkaya, B., Toker, C., “Interference-aware resource allocation for multi-tier uplink NOMA under feedback constraints”, Elsevier Physical Communication, Volume 35, 2019.
- A2. Yuksekkaya, B., Toker, C., “Power and Interference Regulated Water-Filling for Multi-Tier Multi-Carrier Interference Aware Uplink”, IEEE Wireless Communication Letters, Volume 7, Issue 4, Aug 2018 Page(s): 494 – 497.
- A3. Yuksekkaya, B., “Indoor 3D Channel Modelling for Massive MIMO in the 60 GHz mm-Wave Band”, Fırat University Journal of Engineering Science, Volume 30, Issue 2, 2018 Page(s): 175 – 184
- A4. Yuksekkaya, B., Toker, C., “Joint transceiver FIR filter design for multiuser MIMO channel shortening equalization and full equalization using channel duality”, Turkish Journal of Electrical Engineering & Computer Sciences, Volume 25, Jan 2017 Page(s): 4077 – 4090.
- A5. Yuksekkaya, B., “Indoor Channel Modelling for SISO and Massive SIMO in the 60 GHz mm-Wave Band”, Elektronika ir Elektrotechnika, Volume 23, Issue 4, August 2017.
- A6. Yüksel, M., Yuksekkaya, B., “Minimum Outage Probability for the Relay Channel under Individual Power Constraints”, IEEE Communication Letters, Volume 16, Issue 7, July 2012 Page(s): 982 – 985
- A7. Yuksekkaya, B., Kayalar, A.A., Tosun, M.B., Özcan, M.K., Alkar, A.Z., “A GSM, internet and speech controlled wireless interactive home automation system”, IEEE Transactions on Consumer Electronics, Volume 52, Issue 3, August 2006 Page(s): 837-843

PUBLICATIONS
(A. JOURNAL PAPER – B. CONFERENCE PROCEEDING)

- B1. Demir, U., Yuksekkaya, B., Toker, C., “Interference aware optimal resource allocation on V2X networks”, IEEE Signal Processing and Communications Applications Conference (SIU-2019), 24-26 April 2019

- B2. Yuksekkaya, B., Inaltekin, H., Toker, C., “Power control for two-tier multi-carrier MAC under interference constraints”, IEEE Signal Processing and Communications Applications Conference (SIU-2016), 16-19 May 2016

- B3. Yuksekkaya, B., Demir, U., Inaltekin, H., Toker, C., “Power control for two-tier uplink under feedback and interference constraints”, IEEE Signal Processing and Communications Applications Conference (SIU-2016), 16-19 May 2016

- B4. Haliloglu, O., Toker, C., Bulu, G., Yuksekkaya, B., Yanikomeroglu, H., “Energy efficient power control and radio resource management in multi-connectivity framework”, IEEE Signal Processing and Communications Applications Conference (SIU-2016), 16-19 May 2016

- B5. Yuksekkaya, B., Inaltekin, H., Toker, C., Yanikomeroglu, H., “Near-Optimum Power Control for Two-Tier SIMO Uplink Under Power and Interference Constraints”, IEEE 16. International Workshop on Signal Processing Advances in Wireless Communications (SPAWC-2015), June 28 - July 01 2015

- B6. Yuksekkaya, B., Inaltekin, H., Toker, C., Yanikomeroglu, H., “Power Control for Two-Tier SIMO-MIMO Uplink Under Interference Constraints”, IEEE Signal Processing and Communications Applications Conference (SIU-2015), 16-19 May 2015

- B7. Catalbas, C., Yuksekkaya, B., “Country of Origin Estimation From Composite Faces using Kernel Principal Compenent Analysis”, IEEE Signal Processing and Communications Applications Conference (SIU-2014), 23-25 April 2014

- B8. Yuksekkaya, B., Inaltekin, H., Toker, C., “Optimum Uplink Power Control Under Power and Interference Constraints”, IEEE 78nd Vehicular Technology Conference Fall (VTC 2013-Fall), 2013, 2-5 September 2013

- B9. Yuksekkaya, B., Toker, C., “A General Joint Transceiver Design for Multiuser MIMO Channel Equalization”, IEEE 72nd Vehicular Technology Conference Fall (VTC 2010-Fall), 2010, 6-9 September 2010, Page(s): 1 – 5

- B10. Yuksekkaya, B., Toker, C., “Joint Transceiver Design for Multiuser MIMO Channel Equalization”, IEEE Signal Processing and Communications Applications Conference (SIU-2010), 22-24 April 2010, Page(s): 316 – 319

- B11. Yuksekkaya, B., Toker, C., “A General Framework for Joint Transceiver Design for Multiuser MIMO Channel Shortening Equalization”, IEEE/SP 15th Workshop on Statistical Signal Processing, 2009, SSP '09, Aug. - Sep. 2009 Page(s): 105 – 108