

CENK TOKER (PhD., Assist. Prof.)

Hacettepe University
Dept. of Electrical and Electronics Engineering,
Beytepe, 06800, Ankara, Turkey
Phone: +90-(312) 297 7006
Fax : +90-(312) 299 2125
Email: cenk.toker@ee.hacettepe.edu.tr
Web: <http://www.ee.hacettepe.edu.tr/~toker>

RESEARCH INTERESTS

- MIMO communication channel equalization
 - ML, MMSE, ZF and DFE receivers,
 - Channel shortening equalization for frequency-selective fading MIMO/OFDM channels,
 - Blind channel shortening equalization,
- Resource allocation
 - Optimum transmitter power allocation,
 - Optimum frequency bin bit loading for OFDM/DMT,
- Transmitter and receiver design for OFDM and CDMA systems
 - RAKE receiver for CDMA,
 - OFDM transmission structures including TEQ and FEQ blocks,
- Space-Time Coding and Diversity techniques
 - Transmit/Receive Diversity for MIMO/OFDM,
 - Space-Time Block and Trellis Codes,
 - Encoding and decoding structures,
- Multiuser Detection for Asynchronous/Synchronous CDMA systems
 - Linear structures including MMSE and ZF,
 - Non-linear structures including MLSE and interference cancellers (SIC/PIC),
 - Iterative (Turbo) Multiuser Detection,
- Optimization Theory.

EMPLOYMENT

Nov. 2007 - Assistant Professor, Hacettepe University, Department of Electrical and Electronics Engineering, Ankara, Turkey

Nov. 2007 - Vice Chair of the Department of Electrical and Electronics Engineering

2005-2007 Instructor, Hacettepe University, Department of Electrical and Electronics Engineering, Ankara, Turkey

2005 (Mar-Oct) Postdoctoral Research Associate, King's College London, UK

- Investigated optimum resource allocation problem for MIMO/OFDM systems

2003-2004 Teaching Assistant, King's College London, UK

- Fundamentals of Digital Signal Processing

2002 (Summer) Systems Engineer, Motorola, Swindon, UK

- Worked on development and testing of 3G UMTS base stations.

2000 - 2001 Senior Engineer, ASELSAN Inc., Ankara, Turkey

- Examined Reed-Solomon Codes, Turbo Codes, and soft decoding BCJR and SOVA algorithms for decoding Turbo Codes,
- Implemented a real-time Reed-Solomon encoder/decoder on TI TMS320C54x and C50,
- Implemented a real-time Turbo-Code encoder/decoder on TI TMS320C54x using MAP algorithm.

1999 - 2000 Military Service, War Academies Headquarter, Istanbul, Turkey

- 1995 - 1999 Researcher, TÜBİTAK-BİLTEN (Information Technologies Institute), Ankara, Turkey (Consultancy for ASELSAN Inc.)
- Developed a receiver for DSSS Radio including
 - RAKE receiver algorithm,
 - several synchronization algorithms, both at multipath channels and for hostile environments,
 - Developed a receiver for a PMR network system based on
 - GMSK modulation,
 - channel tracking (with LMS and RLS algorithms),
 - Viterbi Algorithm,
 - Worked on a base-station transmission scheme and receiver structure for simulcast communication.

EDUCATION

- 2002-2004 PhD, Centre for DSP Research, King's College London, University of London, U.K.
Thesis Title: Signal Processing Algorithms and Architectures for Communication Transceivers
Supervisors: Dr. S. Lambotharan and Prof. J. Chambers
- Focused on MIMO communication channel equalization for both CDMA and OFDM based systems,
 - Investigated Space-Time Block Coding and proposed several highly implementable improvements for Quasi-Orthogonal Space-Time Block Codes,
 - Developed several transmitter and receiver architectures based on MIMO channel shortening.
- 1996-1999 MSc, Electrical and Electronics Engineering, Middle East Technical University, Ankara, Turkey
Thesis Title: Performance Analysis of a New Synchronization Method for DSSS Radio
Supervisor: Prof. Y. Tank
- Investigated CDMA receiver structures, particularly the RAKE receiver and DSSS synchronization.
- 1991-1995 BSc, Electrical and Electronics Engineering, Hacettepe University, Ankara, Turkey (ranked 3rd)
- 1983-1991 TED Ankara College, Ankara, Turkey

HONORS and AWARDS

- Supervised the winner of the 5th Senior Design Project Competition organised by the Faculty of Engineering, Hacettepe University, project title: Unmanned Aerial Vehicle, 2008
- Received sponsorship for the first year of my PhD studies from Motorola, Swindon, UK through the University Partnership for Research (UPR) Programme, 2001-2
- Received sponsorship from the School of Physical Sciences and Engineering, King's College, University of London, U.K. for the rest of my PhD studies, 2002-4
- Ranked third (out of seventy) during BSc with CGPA 3.51/4.00,
- Biographee, Marquis Who's Who in World, 2006-7
- Biographee, The IBC Leading Engineers of the World, 2007

RESEARCH PROJECTS

- TÜBİTAK*, Turkey, 107E056 (\$95,000), Principal Investigator, "Channel Shortening Equaliser Design and Resource Allocation Algorithm Development for MCM Based Communication Systems", July 2007 – July 2010
- ASELSAN Inc., Turkey (\$114,000), Co-Investigator, "Modulation Recognition of Radar Pulses", July 2007 – March 2008
- EPSRC, UK, GR/S16775/01 (£106,084), Researcher, "Novel Signal Processing Techniques for Enhancing the Downlink Capacity of a Wireless Communication System" Aug 2003 – Oct. 2005
- Motorola Inc., UK, Researcher, "Smart Antennas", University Partnership in Research Programme, 2001
- ASELSAN Inc., Turkey, Researcher, "Design of the IDRS System", 1998-1999,
- ASELSAN Inc., Turkey, Researcher, "DSSS Packet Radio Simulation Project", 1995-1998

*: The Scientific and Technological Research Council of Turkey

PUBLICATIONS

Refereed Journal Articles

- **C. Toker**, G. Altın, “Blind, Adaptive Channel Shortening Equalizer Algorithm which can Provide Shortened Channel State Information (BACS-SI)”, IEEE Trans. Signal Processing, vol.57, no.4, pp.1483-1493, April 2009
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Joint Transceiver Design for MIMO Channel Shortening”, IEEE Trans. Signal Processing, vol. 55, no.7, pp.3851-3866, July 2007,
- S. Lambotharan, Y. Luo, **C. Toker**, S. R. Alty, M. Gani, “Blind Multiuser Detection of STBC Signals Using Hybrid Constant Modulus and Subspace Methods”, IEE Proceedings - Communications, vol. 153, no.2, pp. 159-164, April 2006,
- S. Lambotharan, **C. Toker**, “Closed-Loop Space Time Block Coding Techniques for OFDM based Broadband Wireless Access Systems”, IEEE Trans. Consumer Electronics, vol.51, no.3, pp. 765-769, Aug. 2005
- **C. Toker**, S. Lambotharan, J. A. Chambers, B. Baykal, “Joint Spatial and Temporal Channel Shortening Techniques for Frequency Selective Fading MIMO Channels”, IEE Proceedings - Communications, vol. 152, no. 1, pp. 89-94, Feb. 2005,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Closed Loop Quasi-Orthogonal STBCs and their Performance in Multipath Fading Environments when Combined with Turbo Codes”, IEEE Trans. Wireless Communications, vol.3, no. 6, pp.1890-1896, Nov. 2004,

Refereed Conference Papers

- M.K. Özcan, **C. Toker**, “A Low Complexity Algorithm Based On Geometric Programming For Call Admission Control in Wireless Networks”, IEEE SSP’09, Cardiff, UK, 2009
- C. Turgu, **C. Toker**, “A Low Complexity Resource Allocation Algorithm for OFDMA Systems”, IEEE SSP’09, Cardiff, UK, 2009
- B. Yükksekaya, **C. Toker**, “A General Framework for Joint Transceiver Design for Multiuser MIMO Channel Shortening Equalization”, IEEE SSP’09, Cardiff, UK, 2009
- C. Turgu, **C. Toker**, “Resource Allocation for Multiuser MIMO/OFDM Systems”, IEEE SIU 2008, Didim, Turkey, 2008,
- **C. Toker**, G. Altın, “An Adaptive Blind Channel Shortening Algorithm for MCM Systems”, EUSIPCO 2007, Poznan, Poland, 2007,
- **C. Toker**, G. Altın, “Blind, Adaptive Channel Shortening Equaliser Design with Shortened Channel State Information (BACS-SI)”, IEEE SIU 2007, Eskisehir, Turkey, 2007
- **C. Toker**, S. Altınış, “Robust Channel Shortening Equalisation”, COST 289 3rd Workshop, Aveiro, Portugal, 2006,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Orthogonalization of Quasi-Orthogonal Space-Time Block Codes in Multipath Fading Environments”, EUSIPCO, Antalya, Turkey, 2005,
- **C. Toker**, S. Lambotharan, “Sensitivity of the Orthogonalization Methods for QO-STBC to Feedback Errors in an OFDM Environment”, COST 289 2nd Workshop, Antalya, Turkey, 2005,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Joint Transmitter and Receiver Design for MIMO Channel Shortening”, IEEE ICASSP, Philadelphia, 2005,
- **C. Toker**, S. Lambotharan, J. A. Chambers, B. Baykal, “Channel Shortening Filter Design Based on Polynomial Methods”, IEEE VTC Spring, Milan, 2004,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Infinite Length Channel Shortening Filtering Based on Polynomial Approach”, EUSIPCO, Vienna, 2004,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Space-Time Block Coding for Four Transmit Antennas with Closed Loop Feedback over Frequency Selective Fading Channels”, IEEE Information Theory Workshop, Paris, 2003,
- **C. Toker**, S. Lambotharan, J. A. Chambers, “Quasi-Orthogonal Space Time Block Codes with Feedback and Transmit Beamformers”, London Communication Symposium, London, 2003,
- **C. Toker**, Y. Tanik, “Performance Analysis of a Joint Matched Filter Based Synchronization Method for Direct Sequence Spread Spectrum Radio”, IEEE VTC Fall, Atlantic City, NJ, 2001,
- **C. Toker**, “Implementation of Turbo Codes on a Digital Signal Processor”, 1st National Symposium on Telecommunication Technologies, METU, Ankara, 2001.

Technical Reports

- Classification of Radar Pulses using IMOP, ASELSAN, 2008
- Performance Comparison of the Optimum and Suboptimum Multiuser Detectors, the Conventional Matched Filter and the RAKE receivers when applied to Synchronous and Asynchronous CDMA Channels, Motorola, UK, 2002
- IDRS Final Report, ASELSAN, 1999
- DSSS Packet Radio Simulation Projects I and II Final Reports, ASELSAN, 1996 and 1998

MEMBERSHIPS

- Member of IEEE, Communication and Signal Processing Societies,
- Member of IEE

PROFESSIONAL ACTIVITIES

- Reviewer for
 - IEEE Transactions on Signal Processing,
 - IEEE Signal Processing Letters,
 - IEEE Transactions on Communications,
 - IEEE Communications Letters,
 - IEEE Transactions on Wireless Communications,
 - IEEE Transactions on Vehicular Technology,
 - IET Proceedings - Communications,
 - EURASIP Journal on Advances in Signal Processing,
 - IEEE ICASSP,
 - IEEE ICC,
 - IEEE VTC,
 - IEEE SPAWC
- Supervised five MSc thesis,
- Cosupervised two MPhil theses.
- Currently supervising one PhD and six MSc theses.

PROGRAMMING SKILLS

- MATLAB,
- C/C++,
- Assembler (TI TMS320C50 and C54x, PIC, Intel 8086, Zilog Z80),
- LaTeX, Scientific WorkPlace

REFERENCES

- Prof. Jonathon A. Chambers Professor of Communications and Signal Processing
Head of Advanced Signal Processing Group
Communications Division
Department of Electronic and Electrical Engineering Loughborough
Loughborough University, Leics LE11 3TU, United Kingdom
E-mail: J.A.Chambers@lboro.ac.uk
Tel: +(44)-1509-227031 Fax: +(44)-1509-227091
- Dr. Sangarapillai Lambotharan Reader in Communications
Advanced Signal Processing Group
Communications Division
Department of Electronic and Electrical Engineering Loughborough
Loughborough University, Leics LE11 3TU, United Kingdom
E-mail: S.Lambotharan@lboro.ac.uk
Tel: +(44)-1509-227033 Fax: +(44)-1509-227091