CURRICULUM VITAE

NAME: Behrouz Farhang-Boroujeny

ADDRESS: Electrical & Computer Engineering Department
                         University of Utah
                         50 S. Central Campus Drive, Rm. 3280 MEB
                         Salt Lake City, UT84112.

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EDUCATION

Ph.D.   Communications, Elec. Eng. Dept., Imperial College, University of London, 1981.

M.Eng.   System Test Technology, University of Wales, Institute of Science and Technology, U.K., 1977.

B.Sc.   Elec. Eng. Dept., Tehran University, Iran, 1976.

EMPLOYMENT

July 2004 – Professor and Associate Chair, Elec. and Comp. Eng. Dept., Univ. of Utah.

2000 - 2004 Associate Professor, Elec. and Comp. Eng. Dept., Univ. of Utah.

1998-2000 Associate Professor, Elec. Eng. Dept., National Univ. of Singapore.

1990-1998 Senior Lecturer, Elec. Eng. Dept., National Univ. of Singapore.

1989-1990 Senior Visiting Teaching Fellow, Elec. Eng. Dept., National Univ. of Singapore.

1981-1989 Assistant Professor, Elec. Eng. Dept., Isfahan Univ. of Tech., Isfahan, Iran.

1974-1976 Electrical Engineer, Energy Co., Tehran, Iran.

AWARDS & AFFILIATIONS

Graduate Fellowship to pursue Master and Ph.D. degrees, Pahlavi Foundation, Iran, 1976-1980 .

UNESCO/ROSTSCA Young Scientist Award for the year 1987. ROSTSCA stands for Regional Office of Science and Technology for South and Central Asia.

Senior Member, Institute of Electrical and Electronics Engineers.

Guest Editor for special issue on Filter Banks for Next Generation Multicarrier Wireless Communications, EURASIP Journal in Advanced Signal Processign, 2010.

R&D Magazine Award 100, 2012, was awarded for development of a novel spread spectrum technology. Awardees: Behrouz Farhang-Boroujeny and Daryl Wasden of Univ of Utah, and Hussein Moradi, Carl Kutche, Jose Loera, David Couch of Idaho National Laboratory.

Best Demo award, IEEE DySPAN 2012 (Oct. 19-22), Awardees: Daryl Wasden, Arslan Majid, Behrouz Farhang-Boroujeny, Univ of Utah, and Hussein Moradi, Jose Loera, and David Couch, Idaho National Laboratory.

FUNDED RESEARCH

In Univ of Utah

1. Channel estimation and tracking for MIMO channels, $33,800, UU Seed Grant, 2001-2002.
2. Study and implementation in FPGAof high-capacity multiple antenna communication systems, $110,848, L3 Communications, 2003.
3. ITR/SII: A unified approach to communication in space and time, $711,062, NSF, 2001-2004, Collaboration with North Carolina Sate Univ.
4. Sensors for critical fault location for aging wire networks, $419,491, NSF, 2003 – 2006, joint with Cynthia Furse and Reid Harrison, ECE Department, UU.
5. Center of excellence for smart sensors, $115,000, Utah division of economic development, 2003-2004, Collaboration with Cynthia Furse, ECE Department, UU.
6. Integration of Signals and EM, $11,000, UU TA support for course development, 2003-2004.
7. Study and implementation of high-capacity multiple antenna systems. L-3 Communications, $135,331. This project was initiated my Dr. Christian Schlegel. I have taken over the project after Christian left the department.
8. Study of wireless communication systems, $124,520, UU Research Inst. Fund, 2003-2004.
9. Integrated system-level design in electrical engineering: preliminary study, $100,000, NSF, 2003-2004, joint with Cynthia Furse
10. Integrated system-level design in electrical engineering, $999,654, NSF, 2004-2009, joint with Cynthia Furse, Marc Bodson, and Mark Miller.
11. Decoding Methods for MIMO Communication Systems, $68,275, UU Technology commercialization project, 2004-2006.
12. Near-optimal antenna topology and detection strategy for multiple-input multiple-output (MIMO) communication, $240,006, NSF. 2005-2008, joint with Cynthia Furse.
13. Filter bank methods for cognitive (smart) radios, $29,000, UU Seed Grant, 2007-2008.
14. Reliable communication through cognitive radios, $30,000, Mitsubishi Electric Research Laboratories (MERL), 2008-2009, joint with Rong-Rong Chen
15. Next generation communication networks using multicarrier filter banks, $300,000, NSF, 2008-2011, joint with Sneha Kesara.
16. Enabling multiple-input multiple-output (MIMO) communication for complex channels, $330,000, NSF, 2008-2011, joint with Cynthia Furse.

17.   Instrumentation grant: MIMO testbed, $100,000, National Instrument, 2008-2009, a matching fund of $58,000 should be obtained before obtaining the instrument.

In National University of Singapore

Notes: US$1.00 = S$1.60

National Science and Technology Board (NSTB) is the main government research funding agency in Singapore.

NUS stands for National University of Singapore.

TRIO stands for Telecommunications Research Institute of Ontario.

1.   Collaborator: "*Multicarrier Spread Spectrum CDMA for Wireless Communications*", S$450,000, NSTB, 1998 – 2000.
2.   Principal Investigator: "*Study of xDSL Technology*", S$500,000, NSTB, 1997 – 2000.
3.   Principal Investigator: "*Fast algorithms for Digital Signal Processing*", S$158,700, NUS, 1996 – 2000.
4.   Principal Investigator: "*Study of Wireless Indoor Communication Channels*", S$244,950, NUS and NSTB, 1996 - 1999.
        The aim of this project is to study the wireless indoor communication channels and look at implementation issues related to multicarrier based data modems operating at 20 Mbit/s or above. The carrier frequency is set at 5 GHz.
5.   Collaborator: "*Multilevel decision feedback equalizer (MDFE) magnetic recording channel*", 1996 – 1999. This is a joint collaboration between the EE Department of NUS and Data Storage Institute (DSI) of Singapore. My share in this project is equalizer design. There is no specific funding on this project from NUS. However, NUS provides scholarship (S$1,400 per month) to students working under my supervision.

RESEARCH INTEREST

I have general interest in the broad area of adaptive filters and their applications in communication systems. The more specific areas that I have contributed in recently are:

- Frequency domain and subband implementation of adaptive filters.
- Acoustic echo cancellation.
- Active noise control.
- Multicarrier communications.
- xDSL Technology.
- Recording channels (magnetic and optical).
- Adaptive CDMA receivers.
- MIMO communications.
- Optical signal processing.
- Cognitive Radio

NO. OF CURRENT/GRADUATED RESEARCH STUDENTS

Master :   60
Ph.D. :   12

COURSES TAUGHT

Undergraduate
Electronics; Microprocessors; Digital Control Systems; Digital Signal Processing, Communications, Signals and Systems.
Graduate
Digital Signal Processing; Adaptive Filters; Stochastic Processes; Applied Signal Processing, Multirate Signal Processing, Software Radio.

COURSES CAN/INTERESTED TO TEACH

Undergraduate
Circuits; Electronics; Signals and Systems; Digital Signal Processing; Communications.
Graduate
Signal Processing; Adaptive Filters; Stochastic Processes/Random Signal Analysis.

ADMINISTRATIVE DUTIES

In Isfahan Univ of Technology:
1. Member: Curriculum development for undergraduate program (1982-1989)
2. Vice Chairman: Curriculum development for graduate program (1984-1988)
3. Chairman: Laboratories (1983-1989)

In NUS:
1. Member: Engineering Faculty Innovation Center Working Committee (1990-92)
2. Member: EE Department brochures (1990-96).
3. Member: Technology corridor committee (1990-1993).
4. Chairman: Technology corridor committee (since 1993).
5. Member: Curriculum Review Committee (CRC), EE Department (since 1994).
6. Member: Curriculum development for B.Tech. EE Department (1994-95)
7. Coordinator: Accelerated Master Program (AMP) (since 1996).
8. Member: Curriculum trimming committee, EE Department (1997)
9. Lab. supervisor: EE-CWC Telecommunications Systems (since 1997).
10. Member: SEARCH-Communications Committee (since 1997)

In Univ. of Utah:
1. Member: Graduate Committee (2000 - 2003)
2. Member: Advising and Graduation (2000-2001)
3. Chairman: Computing (2000 - 2002)
4. Member: Curriculum (2000-2001)
5. Member: Search Committee (2001-2002)
6. Chairman: Search Committee (2002 - 2003)
7. Member of college council committee (2002 - 2004)
8. Department Associate Chair (2003 -)
9. Member of seed grant committee (2004 -)

OTHER SERVICES

1. Associate Editor: IEEE Signal Processing Letters, 2008- .
2. Associate Editor: IEEE Transactions on Signal Processing, 2001-2004.
3. Chairman: IEEE Communications and Signal Processing Chapter, Utah.
4. Vice Chairman: IEEE Communications and Signal Processing Chapter, Utah.
5. Publication Chair: IEEE ICASSP'2001.
6. Committee member: IEEE Circuits and Systems Chapter (1992-1999).
7. Vice-Chairman: IEEE Circuits and Systems Chapter, Singapore (1999-2000).
8. Committee member: IEEE Signal Processing Chapter (1992-1995).
9. Committee member: IEEE Communications Chapter (1993-1996).
10. Member of Technical Committee, DSP Track II (IEEE ISCAS'99)
11. Local arrangement, 4th Comm. Theory Mini-conference (IEEE Globecom'95).
12. Tutorial Chairman, and Member of Technical Program, ICCS'94 (an IEEE sponsored Singapore based international conference).
13. Member of Technical Program, ICCS'92 (an IEEE sponsored Singapore based international conference).
14. Member: Technical committee of SISIR on "Safety of Information Technology Equipment Including Business Equipment" (1993-1998).

INDUSTRY WORKSHOPS

1. D. Lee Fugal and B. Farhang-Boroujeny, "Wavelets: Basic Theory and Practical Applications for Engineers in Industry," Univ. of Utah, March 25-27, 2002.
2. YC Lim, B Farhang-Boroujeny, and RH Yang, "Digital Signal Processing: The Principles, Implementations & Applications", Workshop, Organized by IEEE Circuits and Systems Chapter, Singapore Section, 27 Nov. - 1 Dec. 1995.
3. B Farhang-Boroujeny, "Digital Signal Processing", Workshop (2 days), Organized by Institute of Microelectronics, Singapore, So far has been run 6 times in the past 3 years, Dates: 8 & 15 June 1996, 9 and 16 Nov. 1996, 24 & 31 May 1997, 14 & 21 Feb. 1998, 9 & 16 May 1998.
4. B Farhang-Boroujeny, "In-house Adaptive Signal Processing Workshop", Silicon Systems (Singapore) Pte Ltd., 25/9, 30/9 & 2/10/1998.

RECENT TECHNICAL TALKS

1. "Efficient Multicarrier Realization of Full-Rate Space-Time Orthogonal Block Coded Systems," July 5, 2002, National Univ. of Singapore.
2. "Multicarrier Modulation with Blind Detection Capability Using Cosine Modulated Filter Banks," June 28, 2002, National Univ. of Singapore.
3. "Multicarrier Communications," Dec. 18, 2001, Univ. of Utah, Arranged by IEEE Communications and Signal Processing Chapter.
4. "Bandwidth Efficient Data Transmission Using Cosine Modulated Filter Banks," June 30, 2001, L-3 Communications, Salt Lake City, Utah.
5. "Coding and Signal Processing Techniques for MIMO Channels of Singapore," Bringham Young University, Oct. 16,2002.
6. "Multicarrier Communications," L-3 Communications, Salt Lake City, Dec. 4, 2002.

7. "Pilot Embedding for Joint Channel Estimation and Data Detection in MIMO Communication Systems," L-3 Communications, Salt Lake City, Jan. 30, 2003.
8. "Multicarrier Modulation with Blind Detection Capability Using Cosine Modulated Filter Banks," Utah State Univ., Jan. 21, 2003.
9. "Multicarrier Modulation with Blind Detection Capability Using Cosine Modulated Filter Banks," Univ of Alberta, Edmonton, Canada, July 17, 2003.
10. "Efficient Multicarrier Realization of Full-Rate Space-Time Orthogonal Block Coded Systems," Univ of Alberta, Edmonton, Canada, July 18, 2003.
11. "Linear processing techniques for MIMO communications," L-3 Communications, Salt Lake City, Aug. 25, 2003.
12. "Markov Chain Monte Carlo Algorithms for CDMA and MIMO Communication Systems," BYU, Provo, Utah, Dec. 4, 2004.
13. "Markov Chain Monte Carlo Algorithms for CDMA and MIMO Communication Systems," L3 Communications, Salt Lake City, Dec. 16, 2004.
14. "Signal Processing Techniques for Spectrum Sensing and Communication in Cognitive Radio Networks," Tutorial, Presented in 2006 Software Defined Radio Technical Conference and Product Exhibition, Nov. 13-17, 2006, Orlando, Florida.

LIST OF PUBLICATIONS

BOOKS

Farhang-Boroujeny, B, *Adaptive Filters: Theory and Applications.* John Wiley (UK), 1998.
Farhang-Boroujeny, B, *Adaptive Filters: Theory and Applications.* John Wiley (UK), 2nd Edition, 2013.
Behrouz Farhang-Boroujeny, *Signal Processing Techniques for Software Radios*. Lulu, January 2008.
Behrouz Farhang-Boroujeny, *Signal Processing Techniques for Software Radios*. Lulu, 2nd Edition, July 2009.

BOOK CHAPTER

Farhang-Boroujeny, B., "Spectral Estimation in Cognitive Radios," in *Handbook on Sensor and Array Processing*, editors: Simon Haykin and K. J. Ray Liu.
Arman Farhang, Nicola Marchetti, and Behrouz Farhang-Boroujeny, "Filter bank multicarrier for massive MIMO," in Signal Processing for 5G: Algorithms and Implementations, John Wiley and Sons, 2015.

PATENTS

Farhang-Boroujeny, B, "Acoustic echo cancellation equipped with howling suppressor and double-talk detector." Singapore patent, Filed Nov. 1997, Application No: 9704040-6.
Farhang-Boroujeny, B, Baoli Wang, M. Chakraborty, "Equalizer design technique for discrete multitone (DMT) data transmission systems." Filed in Singapore Oct. 1998, and in US Sept. 1999.
Farhang-Boroujeny, B, Chong Yuan Ng, "Quarter-rate echo cancellation for asymmetric digital subscriber lines", US patent, Filed March 2000.

Farhang-Boroujeny, B, Chong Yuan Ng, "Methods of time-domain equalizer design and frequency-domain realization for digital subscriber lines", US patent, Filed March 2000.

Farhang-Boroujeny, B, Francois Chin Poh Shin, and Ho Chin Keong, "Added pilot semi-blind (APSB) channel estimation scheme for orthogonal frequency division multiplexing", US patent, Filed March 2001.

Farhang-Boroujeny, B., and Cynthia Furse, "Method and system for robust multi-carrier spread spectrum data transmission over partially jammed channels," Provisional patent, Filed by TTO of Univ of Utah, June 2003. PCT filed in June 2004.

Farhang-Boroujeny, B., H. Zhu, Z. Shi, Haidong Zhu and A. Laraway, "Detector and method for estimating data probability in multi-channel receiver," US patent 7,457,367 Granted on 11/25/2008.

Farhang-Boroujeny, B., P. Amini, "Multi-channel communication method and apparatus using plural Markov chain Monte Carlo simulations," US patent 7,848,440 Granted 12/07/2010.

Farhang-Boroujeny, B., and S. Akoum, "Estimation of log-likelihood using constrained Markov-chain Monte Carlo Simulation," US patent 8,045,604 Granted on 10/25/2011.

Farhang-Boroujeny,Stephen Andrew Laraway,Zhenning and Shi,Haidong Zhu. "Detector and method for estimating data probability in a multi-channel receiver" US patent 7,813,438 Granted on 10/12/2010.

B. Farhang-Boroujeny and H. I. K. *Rao*, "*Multi-channel acoustic echo cancellation system and method*", United States Patent No. US 8,284,949.

B. Farhang-Boroujeny, "*A multiple user communication network*", US provisional patent, filed Nov. 2013.

JOURNAL ARTICLES

[1] M. A. B. Othman; J. Belz; B. Farhang-Boroujeny, "Performance Analysis of Matched Filter Bank for Detection of Linear Chirp Signals," in *IEEE Transactions on Aerospace and Electronic Systems* , vol.PP, no.99, pp.1-1

[2] A. RezazadehReyhani; B. Farhang-Boroujeny, "Capacity Analysis of FBMC-OQAM Systems," in *IEEE Communications Letters* , vol.PP, no.99, pp.1-1

[3] B. Farhang-Boroujeny and H. Moradi, "OFDM Inspired Waveforms for 5G," in *IEEE Communications Surveys & Tutorials*, vol. 18, no. 4, pp. 2474-2492, Fourthquarter 2016.

[4] Mohamed Abou Bakr Othman, John Belz, Behrouz Farhang-Boroujeny, "Radar detection of high-energy cosmic rays in non-Gaussian background using a time-frequency technique," *Digital Signal Processing*, Volume 56, September 2016, Pages 24-34, ISSN 1051-2004, http://dx.doi.org/10.1016/j.dsp.2016.05.010.

[5] Abbasi et al, "First Upper Limits on the Radar Cross Section of Cosmic-Ray Induced Extensive Air Showers", *Astroparticle Physics 87* (2017) p1-17. DOI information: 10.1016/j.astropartphys.2016.11.006.

[6] Cui, W.; Qu, D.; Jiang, T.; Farhang-Boroujeny, B., "Coded Auxiliary Pilots for Channel Estimation in FBMC-OQAM Systems," *IEEE Transactions on Vehicular Technology*, vol. pp, no.99, pp.1-1.

[7] Farhang, A.; Marchetti, N.; Doyle, L.E.; Farhang-Boroujeny, B., "Low Complexity CFO Compensation in Uplink OFDMA Systems With Receiver Windowing," in *Signal Processing, IEEE Transactions on* , vol.63, no.10, pp.2546-2558, May15, 2015.

[8]   S. K. Hashemizadeh, M. J. Omidi, H. Saeedi-Sourck, and B. Farhang-Boroujeny, "Sensitivity Analysis of OFDMA and SC-FDMA Uplink Systems to Carrier Frequency Offset," Springer US, Wireless Personal Communications, vol. 80, no. 4, 2015. pp. 1381-1404.

[9]   Pooyan Amini, R.-R. Chen, and B. Farhang-Boroujeny, "Filter Bank Multicarrier Communications for Underwater Acoustic Channels," *Oceanic Engineering*, *IEEE Journal of* , vol.40, no.1, pp.115-130, Jan. 2015.

[10]   R. Abbasi, M. Abou Bakr Othman, C. Allen, L. Beard, J. Belz, D. Besson, M. Byrne, B. Farhang-Boroujeny, A. Gardner, W.H. Gillman, W. Hanlon, J. Hanson, C. Jayanthmurthy, S. Kunwar, S.L. Larson, I. Myers, S. Prohira, K. Ratzlaff, P. Sokolsky, H. Takai, G.B. Thomson, D. Von Maluski, "Telescope Array Radar (TARA) observatory for Ultra-High Energy Cosmic Rays," *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment,* Volume 767, 11 December 2014, Pages 322-338.

[11]   Behrouz Farhang-Boroujeny, "Filter Bank Multicarrier Modulation: A Waveform Candidate for 5G and Beyond," Advances in Electrical Engineering, vol. 2014, Article ID 482805, 25 pages, 2014. doi:10.1155/2014/482805.

[12]   Bilén, S.G.; Wyglinski, A.M.; Anderson, C.R.; Cooklev, T.; Dietrich, C.; Farhang-Boroujeny, B.; Urbina, J.V.; Edwards, S.H.; Reed, J.H., "Software-defined radio: a new paradigm for integrated curriculum delivery," *Communications Magazine, IEEE* , vol.52, no.5, pp.184,193, May 2014.

[13]   H. Saeedi-Sourk, S. Sadri, Y. Wu, B. Farhang-Boroujeny, "Near maximum likelihood synchronization for filter bank multicarrier systems," IEEE Wireless Communications Letters, vol. 2, no. 2, April 2013, pp. 235 - 238.

[14]   C.H. (George) Yuen, and B. Farhang-Boroujeny, "Analysis of the Optimum Precoder in SC-FDMA," IEEE Transactions on Wireless Communications, vol. 11, no. 11, 2012, pp. 4096-4107.

[15]   D.L. Wasden, H. Moradi, and B. Farhang-Boroujeny, "Design and Implementation of an Underlay Control Channel for Cognitive Radios," IEEE Journal on Selected Areas in Communications, vol. 30, no. 10, Oct. 2012, pp. 1875-1889.

[16]   Sriram N. Premnath, Daryl Wasden, Sneha K. Kasera, Behrouz Farhang-Boroujeny, Neal Patwari, "Beyond OFDM: Best–Effort Dynamic Spectrum Access Using Filterbank Multicarrier", IEEE/ACM Transactions on Networking, 2012.

[17]   H. Wan, R-R. Chen, J.W. Choi, A.C. Singer, J.C. Preisig, B. Farhang-Boroujeny, "Markov chain Monte Carlo detection for frequency-selective channels using list channel estimates," IEEE Journal of Selected Topics in Signal Processing, no. 8, vol. 5, 2011, pp. 1537-1547.

[18]   B. Farhang-Boroujeny, "OFDM versus filter bank multicarrier," IEEE Signal Processing Magazine, April 2011, pp. 92-112.

[19]   H. Saeedi Sourck, Y. Wu, J.W.M. Bergmans, S. Sadri, and B. Farhang-Boroujeny, "Sensitivity analysis of offset QAM multicarrier systems to residual carrier frequency and timing offsets," Elsevier Signal Processing, vol. 91, no. 7, July 2011, pp. 1604-1612 .

[20]   H. Saeedi Sourck, Y. Wu, J.W.M. Bergmans, S. Sadri, and B. Farhang-Boroujeny, "Complexity and performance comparison of filter bank multicarrier and OFDM in uplink of multicarrier multiple access networks," IEEE Trans. Signal Processing, vol. 59, no. 4, April 2011, pp. 1907 - 1912.

[21]   R-R. Chen, K.H. Teo, and B. Farhang-Boroujeny, "Random access protocols for collaborative spectrum sensing in multi-band cognitive radio networks," IEEE Journal of Selected Topics in Signal Processing,   vol. 5, Feb. 2011, pp. 124 – 136.

[22] R-H. Peng, R-R. Chen, and B. Farhang-Boroujeny, "Markov chain Monte Carlo Detectors for channels with intersymbol interference," IEEE Transactions on Signal Processing, vol. 58, no. 4, 2010, pp. 2206 – 2217.

[23] R-R. Chen; R-H. Peng, A. Ashikhmin, B. Farhang-Boroujeny, "Approaching MIMO capacity using bitwise Markov Chain Monte Carlo detection," IEEE Transactions on Communications, vol. 58, no. 2, 2010, pp. 423 – 428.

[24] H.I.K. Rao, and B. Farhang-Boroujeny, "Analysis of the stereophonic LMS/Newton algorithm and impact of signal nonlinearity on its convergence behavior," IEEE Transactions on Signal Processing, vol. 58, no. 12, 2010, pp. 6080 – 6092.

[25] B. Farhang-Boroujeny, and C.H. (George) Yuen, "Cosine Modulated and Offset QAM Filter Bank Multicarrier Techniques: A Continuous-Time Prospect," EURASIP Journal on Signal Processing, Special Issue on Filter Banks for Next Generation Multicarrier Wireless Communications, Volume 2010 (2010), Article ID 165654, 16 pages.

[26] P. Amini, and B. Farhang-Boroujeny, Packet Format Design and Decision Directed Tracking Methods for Filter Bank Multicarrier Systems. EURASIP Journal on Signal Processing, Special Issue on Filter Banks for Next Generation Multicarrier Wireless Communications, Volume 2010 (2010), Article ID 307983, 13 pages.

[27] J. Wilson, A. Nelson, B. Farhang-Boroujeny, "Parameter Derivation of Type-2 Discrete-Time Phase-Locked Loops Containing Feedback Delays," IEEE Trans. Circuits and Systems II, vol. 56, no. 12, Dec. 2009, pp. 886 – 890.

[28] P. Amini, C. Furse, and B. Farhang-Boroujeny, "Filterbanks for Multicarrier Reflectometry," IEEE Sensors Journal, vol. 9, no.12, Dec. 2009, pp. 1831 – 1837.

[29] S.L. Talbot and B. Farhang-Boroujeny, "Time-Varying Carrier Offsets in Mobile OFDM," IEEE Trans. on Communications, vol. 57, no. 9, September 2009, pp. 2790 – 2798.

[30] H.I.K. Rao, B. Farhang-Boroujeny, "Fast LMS/Newton Algorithms for Stereophonic Acoustic Echo Cancellation," IEEE Trans. on Signal Processing, vol. 57, no. 8, Aug. 2009, pp. 2919-2930.

[31] S.A. Laraway and B. Farhang-Boroujeny, "Implementation of a Markov Chain Monte Carlo Based Multiuser/MIMO Detector," IEEE Trans. On Circuits and Systems, vol. 56, no. 1, Jan. 2009, pp. 246-255.

[32] R. Kempter, P. Amini, and B. Farhang-Boroujeny, "Enhancing the Performance of Random Access Networks with Random Packet CDMA and Joint Detection," EURASIP Journal on Advances in Signal Processing, Volume 2009 (2009), Article ID 238103, 16 pages.

[33] B. Farhang-Boroujeny, "Square-root Nyquist (M) filter design for digital communication systems," IEEE Trans. On Signal Processing, vol. 56, no. 5, May 2008, pp. 2127 - 2132.

[34] S.L. Talbot and B. Farhang-Boroujeny, "Spectral Method of Blind Carrier Tracking in OFDM," IEEE Trans. On Signal Processing, vol. 56, no. 7, Part 1, July 2008, pp. 2706 - 2717.

[35] B. Farhang-Boroujeny, "Filter bank spectrum sensing for cognitive radios," IEEE Trans. On Signal Processing, vol. 56, no. 5, May 2008, pp. 1801 - 1811.

[36] B. Farhang-Boroujeny and R. Kempter, "Multicarrier communication techniques for spectrum sensing and communication in cognitive radios," IEEE Commun. Magazine, vol. 46, no. 4, April 2008, pp. 80 - 85.

[37] B. Farhang-Boroujeny, "Prolate Filters for Nonadaptive Multitaper Spectral Estimators With High Spectral Dynamic Range," IEEE Signal Processing Letters, IEEE vol. 15, 2008, 457 – 460.

[38] Y. Deng, V.J. Mathews, B. Farhang-Boroujeny, "Low-Delay Nonuniform Pseudo-QMF Banks With Application to Speech Enhancement," IEEE Transactions on Signal Processing, IEEE Transactions, vol. 5, no. 5, Part 2, May 2007, pp. 2110 – 2121.

[39] R. Kempter, P. Amini, C. Schlegel, and B. Farhang-Boroujeny, "On coverage and routing in wireless ad hoc networks," *IEEE Signal Processing Magazine*, vol. 23, no. 5, pp. 50-62, Sept. 2006.

[40] L. Lin and B. Farhang-Boroujeny, "Convergence Analysis of Blind Equalizer in a Filter bank-based multicarrier communication system," *IEEE Trans. Signal Processing,* vol. 54, pp. 4061-4067, Oct. 2006.

[41] B. Farhang-Boroujeny, H. Zhu, and Z. Shi, "Markov chain Monte Carlo algorithms for CDMA and MIMO communication systems," *IEEE Trans. Signal Processing*, vol. 54, no. 5, pp. 1896 – 1909, May 2006.

[42] S. Naik, C. Furse, and B. Farhang-Beroujeny , "Multicarrier reflectometry," *IEEE Trans. Sensors,* pp. 812 – 818, June 2006.

[43] Lekun Lin and Behrouz Farhang-Boroujeny, "Cosine-Modulated Multitone for Very-High-Speed Digital Subscriber Lines," EURASIP Journal on Applied Signal Processing, vol. 2006, Article ID 19329, 16 pages, 2006.

[44] B. Farhang-Boroujeny and C. Furse, "A robust detector for multicarrrier spread spectrum transmission over partially jammed channels," *IEEE Trans. Signal Proc.*, March 2005, pp. 1038-1044.

[45] H. Zhu, B. Farhang-Boroujeny, and R-R. Chen, "On performance of sphere decoding and Markov chain Monte Carlo detection methods," *IEEE Signal Processing Letters*, Oct. 2005, pp. 669-672.

[46] H. Sun, G. Mathew, and B. Farhang-Boroujeny, "Detection techniques for high-density magnetic recording," *IEEE Trans. Magnetics*, March 2005, pp. 1193-1199.

[47] G. Pasrija, Y. Chen, B. Farhang-Boroujeny, and S. Blair, "DSP approach to the design of nonlinear optical devices," EURASIP Journal on Applied Signal Processing, July 2005, pp. 1485-1497. **Winner of the best paper award**.

[48] Y. Chen, G. Pasrija, B. Farhang-Boroujeny, and S. Blair, "Engineering the nonlinear phase shift using multi-stage auto-regressive moving-average optical filters," Applied Optics 13, 2564-2574 (2005).

[49] B. Farhang-Boroujeny, "Muticarrier modulation with blind detection capability using cosine modulated filterbanks," *IEEE Trans. Commun.*, Dec. 2003, pp. 2057 - 2070.

[50] B. Farhang-Boroujeny, Lekun Lin, "Analysis of post-combiner equalizers in cosine modulated filter bank based transmultiplexer systems," IEEE Trans. Signal Proc., Dec. 2003, pp. 3249 - 3262.

[51] T.M. Ng, B. Farhang-Boroujeny, and H.K. Garg, "An Accelerated Gauss-Seidel Method for Inverse Modeling," Elsevier, Signal Processing, vol. 83, 2003, pp. 517-529.

[52] Ming Jin, K. A. S. Immink, and B. Farhang-Boroujeny , "Design Techniques for Weakly Constrained Codes," IEEE Trans. Commun., vol. 51, May 2003, pp. 709-714.

[53] B. Farhang-Boroujeny, W. Yan, and S. Attallah, "Fast estimation of BER in PAR-limited DMT systems using noise injection method," IEEE Trans. Commun., vol. 51, Feb. 2003, pp. 170-174.

[54] Yan Chen, Geeta Pasrija, Behrouz Farhang-Boroujeny, and Steve Blair, "Engineering the nonlinear phase shift," Optics Letters, 28, p. 1945-1947 (2003).

[55] H. Zhu, B. Farhang-Boroujeny, and C. Schlegel, "Pilot embedding for joint channel estimation and data detection in MIMO communication systems," IEEE Communications Letters, January 2003, pp. 30-32.

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