Department of Electrical and Computer Engineering

ACADEMIC RESUME

Hamid Farrokhi

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PERSONAL DATA

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Birth: Sept. 16, 1966, Birjand, Iran

EDUCATION

Ph.D., University of Regina, Regina, Canada, 2006, Electrical Engineering (Communications Engineering)

M.Sc., Iranian University of Science and Technology (IUST), 1996, Electrical Engineering (Electronics)

B.Sc., Sharif University of Technology (SUT), 1988, Electrical Engineering (Communications Engineering)

PROFESSIONAL EXPERIENCE

University of Birjand, 2014- present , Associate Professor of Electrical Engineering, 2006-2014, Assistant Professor of Electrical Engineering, 1998-2014, Academic Staff (Instructor), 1991-1998, Instructor and Research Engineer.

Teaching & Research Assistant, Faculty of Engineering, University of Regina, Regina, Canada, September, 2001- May, 2006.

Head of the Electronics and Communication Group, Faculty of Engineering, University of Birjand, Birjand, Iran, February 97-March 99.

Research Engineer, Iranian Telecommunication Research Center, Tehran, Iran, September 1990- February 1991.

PUBLICATIONS

Books

Zeraatkar Moghaddam, J., Farrokhi, H., *Engineering Optimization using MATLAB (Theory and Practice)*, 1st edition, (2018), University of Birjand publications.

Journal Papers

1. A. Gholamrezaee, H. Farrokhi, Javad Zeraatkar Moghaddam, “Fair Resource Allocation and SBS Selection for MC-NOMA-based HetNets Supporting D2D communications,” Published online in 2024 Elsevier’s Physical Communications (PHYCOM) at https://doi.org/10.1016/j.phycom.2024.102297.

2. M. Sadeghian Kerdabadi, R. Ghazizadeh, H. Farrokhi, M. Najimi, “ Joint Sensing Times Detection Thresholds and Users Association Optimization in Multi-Channel Multi-Antenna Cognitive Radio Networks,” International Journal of Engineering, vol. 36, no. 9, pp. 1704-1719, 2023, https://doi.org/10.5829/ije.2023.36.09c.15.

3. A. Gholamrezaee, H. Farrokhi, “Spectrum-efficient mode selection and fair resource allocation for D2D-enabled uplink/downlink MC-NOMA networks,” Digital Signal Processing (Elsevier), vol. 137, no. 15, 2023. https://doi.org/10.1016/j.dsp.2023.104050.

4. M. S. Kerdabadi, R. Ghazizadeh and H. Farrokhi, “Joint Improvement of Spectral and Energy Efficiency in Energy Harvesting Based Cognitive Radio Networks,” Journal of Electrical and Computer Engineering Innovations (JECEI), vol. 10, no. 1, 2022, https://doi.org/10.22061/jecei.2021.7501.396.

5. S. A. Hashemi and H. Farrokhi, “Mobility robustness optimization and load balancing in self-organized cellular networks: Towards cognitive network management,” Journal of Intelligent & Fuzzy Systems, vol. 38, no. 3, pp. 3285-3300, 2020.

6. A. Gholamrezaee, H. Farrokhi, Javad Zeraatkar Moghaddam, “Fairness Resource Allocation for MIMO OFDM-based Multicast System using GA/PSO,” *Journal of Iranian Association of Electrical and Electronics Engineers(IAEEE)*, 2020, vol. 17, no. 1, pp. 69-77. http://jiaeee.com/article-1-522-en.pdf.

7. A. Moradi, H. Farrokhi and R. Ghazizadeh, “Throughput optimization using simultaneous sensing and transmission in energy harvesting cognitive radio networks,” International Journal of Communication Systems (IJCS), vol. 32, no. 3, 2019, https://doi.org/10.1002/dac.3850.

8. A. Moradi, H. Farrokhi, “Performance improvement of multi user cognitive relay networks with full-duplex cooperative sensing and energy harvesting,” Turkish Journal of Electrical Engineering and Computer Sciences, vol. 27, no. 5, pp. 2400-2416, 2019, https://doi.org/10.3906/elk-1807-297.

9. M. S. Kerdabadi, F. Parsaie Nejad, R. Ghazizadeh and H. Farrokhi, “ Wireless sensor network localization using new heuristic optimization algorithms,” *International Journal of Ultra Wideband Communications and Systems*, vol. 3, no. 4, pp. 209-218, 2018. https://dx.doi.org/10.1504/IJUWBCS.2018.092434.

10. M. S. Kerdabadi, R. Ghazizadeh, H. Farrokhi, and M. Najimi, “Energy consumption minimization and throughput improvement in cognitive radio networks by joint optimization of detection threshold, sensing time and user selection,” *Wireless Networks*, col. 96, pp. 2463–2484, 2017, https://link.springer.com/content/pdf/10.1007/s11276-018-1797-x.pdf.

11. H. Farrokhi, I. Pourmohammadi, " Adaptive Rateless Coding Technique for Data Dissemination in Multichannel Multiuser Cognitive Radio Networks," *Wireless Personal Communications (WPC)*, vol. 96, pp. 2463–2484, 2017. https://link.springer.com/content/pdf/10.1007/s11277-017-4307-z.pdf.
12. J. Zeraatkar Moghaddam, H. Farrokhi and Naaser Neda, "Interference Management in Cognitive Radio Networks using Cooperative Beamforming with Imperfect CSI," *Journal of Iranian Association of Electrical and Electronics Engineers,* 2017, vol. 14, no. 2, pp: 1-9. http://jiaeee.com/article-1-383-en.pdf.
13. J. Zeraatkar Moghaddam, H. Farrokhi, Naaser Neda, "Joint Clustering Relay Selection and Beamforming in Cooperative Cognitive Radio Networks," *Wireless Personal Communications (WPC)*, vol. 95, pp. 3601–3616, 2017, https://link.springer.com/content/pdf/10.1007/s11277-017-4014-9.pdf
14. S. Khosroazad, N. Neda and H. Farrokhi, " Time-Varying Frequency Fading Channel Tracking in OFDM-PLNC System Using Kalman Filter," *Iranian Journal of Electrical & Electronic Engineering*, vol. 12, no. 3, Sept. 2016. http://ijeee.iust.ac.ir/article-1-932-en.pdf.
15. A. Moradi, H. Farrokhi and V. Najafpoor, " Maximum Throughput of Cognitive Relay Systems," *International Journal of Advanced Biotechnology and Research*, vol. 7, Special Issue 5, pp1037-1043, July, 2016.
16. J. Zeraatkar Moghaddam, H. Farrokhi, and N. Neda, " Optimal cooperative beamforming design in cognitive radio networks with multiple secondary user links," *International Journal of Communication Systems (IJCS)*, vol. 30, no. 9, pp. 1-11, 2016. https://onlinelibrary.wiley.com/doi/10.1002/dac.3186.
17. J. Zeraatkar Moghaddam, H. Farrokhi, and F. Granelli, " Optimal received SINR balancing based on cooperative beamforming in cognitive radio networks," *International Journal of Communication Systems (IJCS)*, vol. 8, no. 30, 2016, https:// onlinelibrary.wiley.com/doi/10.1002/dac.3173.
18. J. Zeraatkar Moghaddam, H. Farrokhi and N. Neda, "Analyzing the effects of the transmitter and receiver antenna arrays separations on MIMO Channel capacity," *Journal of Iranian Association of Electrical and Electronics Engineers(IAEEE)*, 2016, vol. 13, no. 2, pp. 69-77. http://jiaeee.com/article-1-62-en.pdf.
19. J. Zeraatkar Moghaddam, H. Farrokhi, " Optimal Power Allocation in Spatial MIMO Channel using Heuristic Algorithms," *Majlesi Journal of Electrcial Engineering*, vol. 10, no. 2, 2015.
20. R. Khederzadeh, H. Farrokhi, "Optimal and suboptimal adaptive algorithms for rate and power transmission in OFDM-based Cognitive Radio systems," *Computers & Electrical Engineering (Elsevier)*, vol. 42, pp. 168-177, 2015, https://doi.org/10.1016/j.compeleceng.2015.01.008.
21. R. Khederzadeh, H. Farrokhi, "Adaptive Rate and Power Transmission in Spectrum-Sharing Systems With Statistical Interference Constraint," *IET Communications*, vol. 8, no. 6, pp. 870-877, 2014, https://doi.org/10.1049/iet-com.2013.0698

22. D. Shahbaztabar, H. Farrokhi, "A Comparison between Performances of Orthogonal Filter Banks of Wavelet and Fourier Transforms in OFDM-Based Systems," *Journal of Soft Computing and Information Technology (JSCIT)*, vol.1, no.3, Dec. 2012. Babol Noushirvani University of Technology - Iranian Association of Information and Communication Technology.

23. J. Hassanvand, H. Farrokhi, " Competitive Optimization in Gaussian Interference Frequency-Selective Channels using Games Theory ," *Journal of Soft Computing and Information Technology (JSCIT)*, (in Persian), vol.1, no.3, Dec. 2012. License holder: Babol Noushirvani University of Technology - *Iranian Association of Information and Communication Technology*. https://www.sid.ir/fileserver/jf/7002113910303.pdf.

24. M. Rezay and H. Farrokhi, "A New Multi-objective Optimization Method for Power Control in CDMA Cellular Systems," *Journal of Iranian Association of Electrical and Electronics Engineers (IAEEE).*

25. H. Farrokhi, Mostafa Rezayi, "An improved distributed power-control scheme for cellular mobile systems," *Turkish Journal of Electrical & Computer Science*, vol. 20, no.1, 2012, https://doi.org/10.3906/elk-1006-473.

26. H. Farrokhi, "Design and Performance Evaluation of an Indoor Ranging System Using Audio Chirp and MUSIC Algorithms," *Wseas Transcations on Communications*, vol. 7, no. 9, 2008.

27. M. Rezayi, H. Farrokhi, "An Efficient Multiobjective Power Control Algorithm for Wireless CDMA Networks," *Modares Journal of Electrical Engineering (MJEE)*, vol. 11, Issue 3, 2011.

Conference Papers

1. A. Gholamrezaee, H. Farrokhi, Javad Zeraatkar Moghaddam, "Energy Efficient SBS Selection and Resource Allocation for MC-NOMA based HetNets," هفتمین کنفرانس بین المللی اینترنت اشیاء و کاربردها, Oct. 25, 2023, Isfahan, Iran. https://iot2023.ui.ac.ir/en/.
2. A. Gholamrezaee, H. Farrokhi, Javad Zeraatkar Moghaddam, "Mode Selection and Resource Allocation in D2D-Enabled MC-NOMA using Matching Theory," *13th International Conference on Information and Knowledge Technology (IKT)*, Dec. 20, 2022, Tehran, Iran.
3. A. Gholamrezaee, H. Farrokhi, Javad Zeraatkar Moghaddam, "Sum-Rate Maximization for NOMA-Based Networks with D2D Communications using Matching Theory," *30th Inernational Conference on Electrical Engineering*, Shiraz, Iran, May 17, 2022, https://ieeexplore.ieee.org/document/9827308/.
4. M. S. Kerdabadi, R. Ghazizadeh, H. Farrokhi, "Energy Detection Based Cooperative Spectrum Sensing and Performance Analysis for Soft and Hard Combination Techniques in Cognitive Radio Networks," *The Second Conference on Applied Research in Electrical Engineering (AREE 2021)*, Dec. 1, 2021, Ahvaz, Iran. aree2021.scu.ac.ir.

5. J. Zeraatkar Moghaddam, H. Farrokhi, " Cooperative Sensing in D2D-Based Cognitive Radio Networks Using Directional Antennas," *The Second Conference on Applied Research in Electrical Engineering*, (in Persian), Oct. 1, 2021, Ahwaz, r, Iran.https://civilica.com/doc/1474728/download, aree2021.scu.ac.ir.
6. S. E. Mousavi, J. Zeraatkar Moghaddam and H. Farrokhi, " افزایش گذردهی رادیوشناختگر و بهبود عملکرد آن در حوزهٔ سلامت," 1st Conference on Healthcare Computing Systems and Technology (CHEST 2019), University of Birjand, Birjand, Iran, 17-18 Apr. 2019. ttps://civilica.com/doc/923447/
7. M. S. Kerdabadi, R. Ghazizadeh, H. Farrokhi, "Cooperative Spectrum Sensing and Performance analysis for Energy Detection based Techniques in Cognitive Radio Networks," *4th national and 2nd international conference on applied research in Electrical, Mechanical and Mechatronics,* Feb, 16, 2017, Tehran, Iran.
8. A. Gholamrezaee, H. Farrokhi, R. Havangi, "Fairness Resource Allocation for Multiuser OFDM Systems using Hopfield Neural Network," *4th National Conference on Information Technology, Computer, & Telecommunication*, (in Persian), July 17, 2017, Mashhad, Iran. https://civilica.com/doc/668911.

12. M. S. kerdabadi, F. Parsaienejad, R. Ghazizadeh, and H. Farrokhi, "Optimal power control in cognitive radio networks by gravitational search algorithm," *3rd International Congress on Computer, electrical and Communication,* 2016.
13. H. Farrokhi, S. M. R. Mosavi, A. Nakhaei, " Prediction of DGPS Corrections Using Kalman Filter," *The 30th Asian Conference on Remote Sensing, ACRS2009*, Beijing, China, 18th-23rd Oct. 2009, www.acrs2009.org, ID#D0770825.
14. Ron Palmer, H. Farrokhi, Jenny Jin Xie, "Guidance Error Reduction Using a Combination of GPS and a Single Radial," *AIC 2002 Meeting CSAE/SCGR Program*, Saskatoon, Saskatchewan, July 14 - 17, 2002.
15. H. Farrokhi and Ron Palmer, "Determination of chip rate and center frequency for a spread spectrum acoustic ranging system," *Proceedings of the 2002 IEEE Canadian Conference on Electrical & Computer Engineering*, Winnipeg, Canada, May 2002.
16. H. Farrokhi, Ronald J. Palmer" The designing of an indoor acoustic ranging system using the audible spread spectrum LFM (chirp) signal," Canadian conference on Electrical and Computer Engineering (*CCECE*), May 2005, Saskatoon, Canada.
17. H. Farrokhi, "TOA estimation using MUSIC super-resolution techniques for an indoor audible chirp ranging system," *IEEE International Conference on Signal Processing and Communications (ICSPC 2007)*, 24-27 Nov. 2007, Dubai, UAE.
18. Mostafa Rezayi, H. Farrokhi "Performance evaluation of an improved distributed power-control scheme for cellular mobile systems," *IEEE 2nd Pacific-Asia Conference on Circuits, Communications and System (PACCS)*, 1-2 Aug., 2010, Beijing, China.
19. S. Ali. Hosseini, H. Farrokhi, "The impacts of network size on the performance of routing protocols in mobile ad-hoc networks," *IEEE 2nd Pacific-Asia Conference on Circuits, Communications and System (PACCS)*, 1-2 Aug., 2010, Beijing, China.

20. H. Farrokhi, "Performance of Root-MUSIC on TOA Estimation for an Indoor Spread Spectrum Ranging System*," 12th WSEAS International Conference on communications,* Heraklion, Greece, July 23-25, 2008.

۲۱. ‘‘الگوریتم ژنتیک در بهینه سازی سازی تخصیص توان سیستمهای MIMO-OFDM تحت شبکه های رادیو شناختگر (CR)’’ ؛ سمیه خسروآزاد، دکتر ناصر ندا و دکتر حمید فرخی؛ بیست و یکمین کنفرانس مهندسی برق ایران (ICEE2013)؛ ۲۴-۲۶ اردیبهشت ۱۳۹۲ (May 16-18, 2013)؛ دانشگاه فردوسی مشهد؛ ایران.

۲۲. ‘‘معرفی و ارزیابی سه الگوریتم بلوکی برای بهبود سرعت همگرایی الگوریتم های کنترل تپان در سیستم های سلولار CDMA’’ مصطفی رضایی؛ حمید فرخی؛ نوزدهمین کنفرانس مهندسی برق ایران (ICEE2011)؛ ۲۷-۲۹ اردیبهشت ۱۳۹۰ (May 17-19, 2011)؛ دانشگاه صنعتی امیرکبیر؛ تهران؛ ایران.

۲۳. ‘‘تخمین کور کانال بر اساس زیرفضا در سیستم های OFDM با استفاده از حامل های مجازی’’ زاهد عزیزی؛ حمید فرخی؛ بیستمین کنفرانس مهندسی برق ایران (ICEE2012)؛ ۲۶-۲۸ اردیبهشت ۱۳۹۱ (May 16-18, 2012)؛ دانشکده فنی دانشگاه تهران؛ تهران؛ ایران.

۲۴. ‘‘الگوریتم کنترل توان توزیعی با بهینه سازی چند منظوره با بهبود ثابت در سیستم های رادیویی سلولار ’’ CDMA مصطفی رضایی؛ حمید فرخی؛ بیستمین کنفرانس مهندسی برق ایران (ICEE2012)؛ ۲۶-۲۸ اردیبهشت ۱۳۹۱ (May 16-18, 2012)؛ دانشکده فنی دانشگاه تهران؛ تهران؛ ایران.

۲۵. ‘‘تخصیص منابع با ترکیب مدولاسیون وفقی و تخصیص توان در شبکه های رادیو شناختگر’’ رضا خدرزاده؛ عبدجبار حسنوند؛ حمید فرخی؛ بیستمین کنفرانس مهندسی برق ایران (ICEE2012)؛ ۲۶-۲۸ اردیبهشت ۱۳۹۱ (May 16-18, 2012)؛ دانشکده فنی دانشگاه تهران؛ تهران؛ ایران.

۲۶. ‘‘ بررسی عملکرد سیستم های رادیوشناختگر مبتنی بر OFDM غیرهمجوار و MC-CDMA غیرهمجوار برای دستیابی به طیف دینامیکی’’ دامون شهبازتبار؛ حمید فرخی؛ چهارمین کنفرانس مهندسی برق و الکترونیک ایران (ICEEE2012)، ۹-۷ شهریور ۱۳۹۱؛ دانشگاه آزاد اسلامی گناباد؛ ایران.

۲۷. ‘‘پیش بینی تصحیحات GPS تفاضلی با استفاده از فیلتر کالمن’’ سید محمدرضا موسوی؛ حمید فرخی؛ آزاده نخعی؛ همایش سراسری سامانه اطلاعات مکانی (GIS)؛ انجمن علمی فناوری اطلاعات و ارتباطات ودجا؛ ۱-۲ آذرماه ۱۳۸۸؛ دانشگاه صنعتی مالک اشتر؛ تهران؛ ایران.

IMPLEMETED RESEARCH PROJECTS

- Farrokhi, H., "Design and Implementation of a Wi-Fi Modem for Simultaneous Transmission and Reception of Sound Signals," University of Birjand, *Project no. 310*, (August 2018).
- Farrokhi, H., "Design and Implementation of a Power Line Modem (PLM) using intel-8051 Microcontroller," NikPajooh Inc. Tehran/Iran, (Macrh 2000).
- Farrokhi, H., Farsi H., "Design and Implementation of a PC Interface Card for the Polarograph Analyzer E506," University of Birjand, (Sept. 1999).

- Farrokhi, H., "Design and Implementation of a Multiplexer Interface Card for 9600 bps Modem," Communication Research Center, Tehran/Iran, (April 1991).

GRADUATE STUDENT ADVISING

Doctoral Graduates

1. Gholamrezayi, A., "Energy-Efficient Resource Allocation for NOMA-Based D2D Communications in HetNets with Energy Harvesting," Expected Graduation Month/Year, (Major Advisor).
2. Kerdabadi, M. S., "Throughput Improvement in Cooperative Multi-Channel Multi-Antenna Cognitive Radio Networks," Sept. 2021, (2nd Advisor).
3. Hashemi, A., "Self-optimization of Handover and Neighbor Parameters in UMTS and LTE Networks," Feb. 2020, (Major Advisor).
4. Moradi, A., "Throughput Improvement using Simultaneous Sensing and Transmission in Energy Harvesting Cognitive Radio Systems," 07/2019, (Major advisor).
5. Zeraatkar Moghaddam, J., "Beamforming in Cognitive Radio Networks," 09/2016, (Major advisor).

Masters Graduates (most recent 5 out of 20)

1. Ghassemi S., (MSc), "Cooperative Spectrum Sensing using Directional Antennas In Cognitive Radio Networks," Oct., 2019 (Major Advisor).
2. Rahbar A., (MSc), "Automatic Intra-pulse Modulation Classification of Advanced LPI Radar Waveforms," Jan., 2019, (Major Advisor).
3. Pakzad S., (MSc), "Analysis of a Hybrid Overlay/Underlay Data Transmission Method for Cognitive Radio Networks With Statistical QoS Provisioning," Jan., 2019, (Major Advisor).
4. Mousavi S. E., (MSc), "Increasing Throughput using Simultaneous Sensing And Transmission in Cognitive Radio Networks," Feb., 2018, (Major Advisor).
5. Mirahmadi E., (MSc), "Performance Evaluation of an Improved MC-CDMA-Based Hybrid Cognitive Radio Network," Jan. 2017, (Major Advisor).

Current Graduate Advising

1. Shirzadeh, M., "3D localization in IoT using array antennas," Approved PhD. Proposal.
2. Mirghadim S. H. S., "Resource Allocation in Hybrid Cognitive Radio Networks with Energy Harvesting," Approved MSc Proposal.
3. Also advising another 4 more PhD. Students whose proposals are not yet approved.

TEACHING

Courses Taught

Graduate:

- Information Theory and Coding
- Advanced Theory of Communications
- Spread Spectrum Systems
- Wireless Communications
- Special Topics in Communications

Undergraduate:

- Electronics I & II & III and Labs
- Digital Circuits and Lab
- Microprocessors and Lab
- Pulse Techniques and Lab
- Communication Circuits and Lab
- Technical English Language (Electrical Engineering)
- Applied Mathematics
- Students' Projects Supervision

MISCELLANEOUS

Scholarships & Awards

Scholarship awarded by the Ministry of Science, Research, and Technology of Iran for Ph.D. studies, Sept. 2001-Nov. 2005.

Graduate Scholarship awarded by the Faculty of Graduate Studies and Research, University of Regina, Jan. 2004-Apr. 2004.

Graduate Research Award from the Faculty of Graduate Studies and Research, University of Regina, May 2002-Aug. 2002.

Scholarship awarded by the Ministry of Science, Research, and Technology of Iran for MSc. studies, Sept. 93-Sept. 96.

Updated: March 16, 2024