

# MICHEL FATTOUCHE

## Home Address

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## University Address

Dept. of Elec. & Comp. Eng.,  
The University of Calgary,  
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## EDUCATION

- 1986**            **Doctorate of Philosophy** in Electrical Engineering  
Field of study: Communications  
Thesis: *Walsh-Hadamard Representation of Finite Memory Transformations*  
University of Toronto, Toronto, Ontario.
- 1982**            **Master of Applied Sciences** in Electrical Engineering  
Thesis: *Nonconstant Envelope Continuous Phase Modulation*  
University of Toronto, Toronto, Ontario.
- 1981**            **Bachelor of Sciences** in Mathematics with Honours  
University of Ain-Shams, Cairo, Egypt.
- 1981**            Course Requirements for **Master of Sciences** in Solid State Physics  
American University in Cairo, Cairo, Egypt.
- 1979**            **Bachelor of Sciences** in Electrical Engineering with Distinction & Honours  
Cairo University, Cairo, Egypt.

- AWARDS:**     ASTech finalist in 1997 for "Outstanding Leadership in Alberta Technology Award."  
"Calgarian of the Year" by Business in Calgary Magazine, December 2000.  
"Prairies Entrepreneur of the Year" October 6, 2000.  
"Professor of the Year" by the student Union, University of Calgary, March 17, 1999.

## WORK EXPERIENCE

### INDUSTRIAL EXPERIENCE

2010-2017 **Chief Technical Officer**, SRD Innovations Inc.  
 2011-2021 **Co-Chief Executive Officer** (Business Development), EatLittle Inc.  
 2010-2012 **Chief Technical Officer**, Cell-Loc Location Technologies Inc.  
 2003-2008 **Chief Technical Officer**, Cell-Loc Location Technologies Inc.  
 1999-2003 **President & CEO**, Cell-Loc Inc.  
 1998-1999 **President**, Cell-Loc Inc.  
 1997-1998 **Chief Technical Officer**, Cell-Loc Inc. (TSX: CLQ)  
 1996-1997 **President**, Cell-Loc Inc.  
 1995-1997 **VP Research**, Cell-Loc Inc.  
 1997-1998 **VP Engineering**, Wi-LAN Inc. (TSX: WIN)  
 1994-1997 **VP Research**, Wi-LAN Inc.  
 1992-1994 **Director of Research**, Wi-LAN Inc.  
 2006-2021 **VP Business Development**, EatLittle Inc.

### ACADEMIC EXPERIENCE

2013-Present **Emeritus Professor**, Department of Electrical & Computer Engineering  
 University of Calgary, Calgary, Alberta.  
 1998-2013 **Professor**, Department of Electrical & Computer Engineering  
 University of Calgary, Calgary, Alberta.  
 1992-1997 **Associate Professor**, Department of Electrical & Computer Engineering  
 University of Calgary, Calgary, Alberta.  
 1986-1992 **Assistant Professor**, Department of Electrical Engineering  
 University of Calgary, Calgary, Alberta.

### RESEARCH EXPERIENCE

1993-2002 **Adjunct Professor**, TR Labs.  
 1989-1993 **Affiliate Professor**, TR Labs.

### BOARD OF DIRECTORS:

2014-2016 **Board Member**, SRD Innovations Inc., Calgary.  
 2013-2017 **Board Member**, Osprey Informatics Inc., Calgary.  
 2020-2023 **Board Member**, Wi-LAN Inc. (now Quarterhill Inc.: TSE:QTRH), Ottawa.  
 2006-18 **Board Member**, Wi-LAN Inc. (now Quarterhill Inc.), Ottawa.  
 2006-Present **Board Member**, EatLittle Inc., Calgary.  
 2010-2012 **Board Member**, Cell-Loc Inc., Calgary.  
 1995-2008 **Board Member**, Cell-Loc Inc., Calgary.  
 2000-2006 **Board Member**, Psinaptic Inc., Calgary.  
 1994-1999 **Board Member**, Wi-COM Technologies Inc., Calgary.  
 1992-1999 **Board Member**, Wi-LAN Inc., Ottawa.  
 1996-1999 **Board Member**, The University of Calgary Engineering Endowment  
 Foundation.

## RESEARCH CONTRIBUTIONS:

### a) Issued Patents:

- [1] M.T. Fattouche, "Conversion filtering for digital signaling systems," U.S. Patent no. 5,127,024, June 30, 1992.
- [2] M.T. Fattouche and H. Zaghoul, "Method and apparatus for multiple access between transceivers in wireless communications using OFDM spread spectrum," U.S. Patent no. 5,282,222, Jan. 25, 1994.
- [3] H. Zaghoul and M.T. Fattouche, "Method and apparatus for demodulation of a signal transmitted over a fading channel using phase estimation," U.S. Patent no. 5,369,670, Nov. 29, 1994.
- [4] M.T. Fattouche and H. Zaghoul, "Multicode direct sequence spread spectrum," U.S. Patent no. 5,555,268, Sept. 10, 1996.
- [5] H. Zaghoul and M.T. Fattouche, "Method and apparatus for the compression, processing and spectral resolution of electromagnetic and acoustic signals," U.S. Patent no. 5,570,305, Oct. 29, 1996.
- [6] W. Lee and M.T. Fattouche, "Peer-peer frequency hopping spread spectrum wireless system," U.S. Patent no. 5,887,022, March 23, 1999.
- [7] M.T. Fattouche, R. Klukas, A. Borsodi, M. Astridge, H. Zaghoul and G. Lachapelle, "Wireless location system," U.S. Patent no. 5,890,068, March 30, 1999.
- [8] M.T. Fattouche, H. Zaghoul, P. Milligan and D. Snell, "Multicode spread spectrum communications system," U.S. Patent no. 6,192,068, February 20, 2001.
- [9] M.T. Fattouche, "Methods and apparatus to position a mobile Receiver using Downlink Signals, Part II," U.S. Patent no. 6,204,812, March 20, 2001.
- [10] M.T. Fattouche and R. Klukas, "Methods and Apparatus to Position a Mobile Receiver using Downlink Signals, Part I," U.S. Patent no. 6,208,297, March 27, 2001.
- [11] G. Messier, B. Petersen and M.T. Fattouche, "Cellular telephone location system," U.S. Patent no. 6,246,861, June 12, 2001.
- [12] M.T. Fattouche, R. Klukas and K. Oler, "Methods and Apparatus to Position a Mobile Receiver using Downlink Signals, Part IV," U.S. Patent no. 6,266,014, July 24, 2001.
- [13] M.T. Fattouche, H. Zaghoul, P. Milligan and D. Snell, "Multicode spread spectrum communications system," U.S. Patent no. 6,320,897, November 20, 2001.
- [14] M.T. Fattouche, A. Borsodi and R. Klukas, "A Network-based Wireless Location System to Position AMPs (FDMA) Cellular Telephones, Part I", U.S. Patent no. 6,330,452, December 11, 2001.
- [15] M.T. Fattouche and H. Zaghoul, "Multicode Direct Sequence Spread Spectrum," U.S. Patent no. 5,555,268, Sept. 10, 1996; Revised 37,802, July 23 2002.
- [16] M.T. Fattouche, "Identification System for Mobile Transceivers," U.S. Patent 6,799,051, issued September 28, 2004.
- [17] M.P. Mintchev, O. Yadid-Pecht, M.T. Fattouche, "Ingestible implement for weight control," U.S. Patent 8,389,003, issued March 5, 2013.
- [18] M. Youssef, N. El-Sheimy, M.T. Fattouche, "Method and apparatus for determining position of a wireless device," U.S. Patent 8,792,908, issued July 29, 2014.
- [19] M.P. Mintchev, O. Yadid-Pecht, M.T. Fattouche, "Device for delivery of a substance," U.S. Patent 8,795,721, issued August 5, 2014.
- [20] M.P. Mintchev, O. Yadid-Pecht, M.T. Fattouche, "Bezoar-forming units for weight control," U.S. Patent 9,066,877, issued June 30, 2015.

- [21] M.P. Mintchev, O. Yadid-Pecht, M.T. Fattouche, "Device for delivery of a substance," U.S. Patent 9,107,820, issued August 18, 2015.
- [22] M.P. Mintchev, O. Yadid-Pecht, M.T. Fattouche, "Ingestible implement for weight control," U.S. Patent 9,579,227, issued February 28, 2017.
- [23] M. Karsi; Murat, D. Gell, M.T. Fattouche, "Multi-layer wireless streaming with adaptive constellation mapping (ACM)," U.S. Patent 9,780,854, issued October 3, 2017.
- [24] M.T. Fattouche, D. Gell, M. Karsi, K. Stanwood, "Root non-orthogonal frequency division multiplexing (RNOFDM)," U.S. Patent 9,838,170, issued December 5, 2017.
- [25] M. Karsi; Murat, D. Gell, M.T. Fattouche, "Multi-layer wireless streaming with adaptive constellation mapping (ACM)," U.S. Patent 10,044,425, issued August 7, 2018.
- [26] M.T. Fattouche, D. Gell, M. Karsi, K. Stanwood, "Enhanced pre-ordered pre-weighted transmission," U.S. Patent 10,069,546, issued September 4, 2018.
- [27] M.T. Fattouche, "Communication System of High Capacity," U.S. Patent 11,451,418 B2, issued September 20, 2022.

**b) Technology Transfer**

- [1] Licensed several Patents to Cell-Loc Inc., 1995-2008.
- [2] Licensed several Patents to Wi-LAN Inc., 1993 to present.
- [3] Licensed several PCT Patent Applications to EDF Inc., 2006 to present.
- [4] US patents 6,799,051, 6,330,452, 6,266,014, 6,208,297, 6,204,812 and 5,890,068 on wireless location generated revenues of \$4.6M for 2009.
- [5] US patents on wireless data communications: RE37,802, 6,320,897, 5,555,268, 5,282,222 and 6,192,068 licensed to more than 100 wireless companies with a recurring royalty generation of \$18.9M for 2009, \$30.1M for 2010 and \$75M for 2011.
- [6] US patent 5,570,305 sold to Wi-LAN Inc. for \$100K, 2008.
- [7] US patent 5,890,068 sold to Samsung Electronics, Wireless Division for \$750K, 2009.

**c) Product Development**

- [1] Hopper, DS-SSSS modem, 19.2-115kbps, 902-926MHz unlicensed band, Wi-LAN Inc. 1993-1999.
- [2] Hopper +, DS-SSSS CSK modem, up to 1Mbps, 2.4GHz unlicensed band, Wi-LAN Inc. 1994-2000.
- [3] AWE Product Lines, OFDM modem, up to 16Mbps, 2.4GHz and 5.7GHz, unlicensed band, Wi-LAN Inc. 1999-2005.
- [4] Cellocate-AMPs, E911 compliant for locating AMPs Cellular Telephone, Cell-Loc Inc., 1998. Networks deployed in Austin Tx and Calgary Alberta in 2000.
- [5] Cellocate-CDMA for locating CDMA Cellular Telephone, Cell-Loc Inc., 2000. Product line sold to Chinese subsidiary.
- [6] Cellocate-Beacon, 2.4GHz unlicensed band, Cell-Loc Location Technologies, 2001. Networks deployed in Sao Paulo, Brazil, in Calgary, Alberta and in Saskatoon, Saskatchewan.
- [7] Zalak A, ingestible capsule for gastric volume-taking, regulated as a Dietary supplement, EDF Inc., 2009.
- [8] Zalak B, ingestible capsule for gastric volume-taking, regulated as a Dietary supplement, EDF Inc., 2010.

- [9] Cellocate-Telemetry for sending up 256Bytes of data Up-link and up to 64Bytes of data Down-link, Cell-Loc Location Technologies Inc., 2011.
- [10] Eat-Little, ingestible capsule for gastric volume-taking, regulated as a Dietary supplement, EDF Inc., 2011.
- [11] HyMesh™ WiFi Extender for extending WiFi Coverage over large distances, SRD Innovations Inc. 2015.

#### d) Publications

##### i) Papers Published in Refereed Journals

- [1] M. Jorgenson, M. Fattouche and S.T. Nichols, "Applications of Minimum Redundancy Arrays in Adaptive Beamforming," *IEE Proceedings*, Section-H: Antenna & Propagation, vol. 138, no. 5, pp. 441-447, October 1991.
- [2] R. Klukas, G. Lachapelle and M. Fattouche, "Innovation: Cellular Telephone Positioning Using GPS Time Synchronization," *GPS World*, vol. 9, no.4, pp. 49-54, April 1998.
- [3] M. Fattouche and D. Irvine-Halliday, "Asymmetric Convolutional Encoding for a Direct-Detection Optical Fiber Channel," *Journal of Electrical and Electronics Engineering*, Australia, Vol. 12, no. 1, pp. 28-41, March 1992.
- [4] H. Zaghoul, G. Morrison and M. Fattouche, "Frequency Response and Path Loss Measurements of Indoor Channel," *Electronics Letters*, vol. 27, no. 12, pp. 1021-1022, June 6, 1991.
- [5] M. Jorgenson, M. Fattouche and S.T. Nichols, "An Adaptive Minimum Redundancy Array For Digital Communications," *Canadian Journal of Electrical and Computer Engineering*, vol. 16, no. 3, pp. 105-111, July 1991.
- [6] M. Fattouche and H. Zaghoul, "Estimation of Phase Differential of Signals Transmitted over Fading Channels," *Electronics Letters*, vol. 27, no. 20, pp. 1823-1824, Sept. 20, 1991.
- [7] H. Zaghoul, M. Fattouche, G. Morrison and D. Tholl, "Comparison of Indoor Propagation Channel Characteristics at different Frequencies," *Electronics Letters*, vol. 27, no. 22, pp. 2077-2079, October 24, 1991.
- [8] D. Tholl, M. Fattouche, R.J.C. Bultitude, P. Melancon and H. Zaghoul, "A Comparison of Two Radio Propagation Channel Impulse Response Determination Techniques," *IEEE Trans. Ant. & Prop.*, vol. 41, no. 4, pp. 515-517, April 1993.
- [9] M. Fattouche, B. Olasz, K. Scott and H. Zaghoul, "Modified Simulation of Urban Radio Propagation," *Electronics Letters*, vol. 29, no. 21, pp. 1825-1826, October 14, 1993.
- [10] M.R. Gibbard, G. Morrison, A. Sesay and M. Fattouche, "Broadband TDMA over the Indoor Radio Channel," *Electronics Letters*, vol. 30, no. 4, pp. 285-286, February 17, 1994.
- [11] L. Dumont, M. Fattouche and G. Morrison, "Superresolution of multipath channels in a spread spectrum location system," *Electronics Letters*, vol. 30, no.19, pp.1583-1585, September 15, 1994.
- [12] M. Fattouche and H. Zaghoul, "Data Communications over the Mobile Radio Channel Using IS-54," *Wireless Personal Communications*, vol. 1, no. 3, pp.221-228, 1995.
- [13] B.P. Donaldson, M. Fattouche and R.W. Donaldson, "Characterization of in-building wireless radio communication channels using spectral energy measurements," *IEEE Trans. Antennas and Propagation*, vol.44, no.1, pp.80-86, Jan. 1996.

- [14] R. Klukas and M. Fattouche, "Line of Sight Angle of Arrival Estimation in the Outdoor Multipath Environment," *IEEE Trans. Vehicular Tech.*, vol. 47, no.1, pp. 342-351, Feb. 1998.
- [15] G. Morrison and M. Fattouche, "Super Resolution Modeling of the Indoor Radio Propagation Channel," *IEEE Trans. Vehicular Tech.*, vol. 47, pp. 649-657, May 1998.
- [16] C. Botteron, A. Høst-Madsen, M. Fattouche, "Effects of System and Environment Parameters on the Performance of Network Based Mobile Station Position Estimators," *IEEE Transactions on Vehicular Technology*, vol. 53, no. 1, January 2004, pp. 163-180.
- [17] C. Botteron, A. Høst-Madsen, M. Fattouche, "Cramer-Rao Bound for the Estimation of Multipath Parameters and the Mobiles' Positions in Asynchronous DS-CDMA System," *IEEE Transactions on Signal Processing*, vol. 52, no. 4, April 2004, pp. 862-875.
- [18] D. Wang and M. Fattouche, "OFDM Transmission for Time-Based Range Estimation," *IEEE Signal Processing Letters*, vol.17, no.6, pp. 571-574, June 2010.
- [19] T.D. Jones, K. Kaler, M. Fattouche, M.P. Mintchev, "Wireless Communication and Control System for Portable Micro-Electromechanical Device for Real-Time Blood Sampling and Glucose Analysis (Electronic Mosquito)," *Institute of Information Theories and Applications International Journals*, June 2010.
- [20] M.P. Mintchev, M.G. Deneva, B.I. Aminkov, O. Yadid-Pecht, M. Fattouche, R.C. Bray, "Pilot Studies of Temporary Controllable Gastric Pseudobezoars (Pseudofood) as an Alternative to Bariatric Surgery for the Treatment of Obesity," *Gastroenterology*, vol. 138, issue 5, supplement 1, pp. S755, May 2010.
- [21] M.P. Mintchev, M.G. Deneva, B.I. Aminkov, M. Fattouche, O. Yadid-Pecht, R.C. Bray, "Pilot Study of Temporary Controllable Gastric Pseudobezoars for Dynamic Non-Invasive Gastric Volume Reduction," *Physiol Meas*, vol. 31, issue 2, pp. 131-44, January 2010.
- [22] G. Zhao, D. Wang and M. Fattouche, "Time Sum of Arrival Based BLUE for Mobile Target Positioning," *Advanced Science Letters*, vol. 4, no. 1, pp. 165-167, Jan., 2011.
- [23] D. Wang and M. Fattouche, "Multipath Mitigation for LOS TBRE Using NDB OFDM Transmission and Phase Correlation," *IET Electronics Letters*, vol.46, no. 21, pp. 1467-1468, Oct. 2010.
- [24] D. Wang, R. He, J. Han, M. Fattouche and F.M. Ghannouchi, "Sensor Network Based Oilwell Health Monitoring and Intelligent Control," *IEEE Sensors Journal*, Sept. 2011, doi: 10.1109/JSEN.2011.2170411.
- [25] D. Wang, H. Leung, M. Fattouche and F.M. Ghannouchi, "Efficient Spectrum Allocation and TOA-based Localization in Cognitive Networks," *Wireless Personal Communications*, Springer, Jul. 2011, doi: 10.1007/s11277-011-0365-9.
- [26] D. Wang, M. Fattouche and F.M. Ghannouchi, "Geometry-based Doppler analysis for GPS receiver," *Wireless Personal Communications*, Springer, Oct. 2011, doi: 10.1007/s11277-011-0435-z.
- [27] G. Zhao, D. Wang, M. Fattouche and M. Jin, "A Novel OFDM-Based Wireless Positioning Protocol for Cellular Networks," *ICIC Express Letters*, vol.5, no. 4 (B), pp. 1207-1212, Apr. 2011.
- [28] D. Wang, M. Fattouche and F.M. Ghannouchi, "Fundamental Limit of OFDM Range Estimation in a Separable Multipath Environment," *Circuits, Systems and Signal Processing*, Springer, Sept. 2011, doi: 10.1007/s00034-011-9366-x.

- [29] K. Fallahi, C.T. Cheng, M. Fattouche, "Robust Positioning Systems in the Presence of Outliers Under Weak GPS Signal Conditions," *IEEE Systems Journal*, vol. 6, issue 3, Nov. 2011, doi: 10.1109/JSYST.2011.2173622.
- [30] S. Tiwari, D. Wang, M. Fattouche and F.M. Ghannouchi, "A Novel Method for 3D Positioning In an Indoor Environment," *Signal Processing*, Article ID: 503707, pp. 1-17, Nov. 2011.
- [31] G. Zhao, D. Wang, M. Fattouche and M. Jin, "Novel Wireless Positioning System for OFDM-based Cellular Networks," *IEEE Systems Journal*, vol. 6, issue 3, Feb. 2012, doi:10.1109/JSYST.2012.2183031.
- [32] F. Kia, D. Wang and M. Fattouche, "Probability of Outlier Analysis in Detection and Estimation of Weak GPS Signals," *Journal of The Franklin Institute – Special Issue on Nonlinear Multiresolution algorithms and Applications*, vol. 346, no. 5, pp. 1930-1943, June 2012.
- [33] D. Wang, M. Fattouche and F. M. Ghannouchi, "Multicarrier Code for the Next-Generation GPS," *EURASIP Journal on Wireless Communications and Networking*, May 2012.
- [34] D. Wang and M. Fattouche, "Range Estimation in a Time-Varying Multipath Channel," *Wireless Personal Communications*, September 2012.
- [35] M.G. Deneva, O. Yadid-Pecht, M. Fattouche, M.P. Mintchev, "Utilization of Temporary Controllable Intra-gastric Pseudobezoars for the Treatment of Obesity," *Current Obesity Reports*, 1(2), pp. 68-74, 2012.
- [36] B. Georgescu, R. Salmeh, M. Fattouche and F. Ghannouchi, "Two-Tone Phase Delay Control of Center Frequency and Bandwidth in Low-Noise-Amplifier RF Front Ends," *IEEE Transactions on Circuits and Systems, Express Briefs*, vol. 60, no. 4, pp. 192-196, April 2013.
- [37] D. Wang, M. Fattouche and X. Zhan, "Pursuance of mm-level Accuracy: Ranging and Positioning in mmWave Systems," *IEEE Systems Journal*, vol. 13, issue 2, March 2018, doi: 10.1109/JSYST.2018.2805879.
- [38] D. Wang, M. Fattouche, F.M. Ghannouchi and X. Zhan, "Quasi-Optimal Subcarrier Selection Dedicated for Localization with Multicarrier-based Signals," *IEEE Systems Journal*, vol. 13, issue 2, March 2018, doi: 10.1109/JSYST.2018.2864794.
- [39] M. Fattouche, "A Novel Communication System of High Capacity," *IEEE Systems Journal*, vol. 14, issue 3, September 2020, doi: 10.1109/JSYST.2019.2961131.

**ii) Refereed Conference Papers:**

- [1] M. Fattouche and S. Pasupathy, "A New Representation of Continuous Phase Modulation," Thirteenth *Biennial Symposium on Communications Rec.*, pp. A.4.5-A.4.8, 2-4 June 1986, Kingston, Ontario.
- [2] M. Fattouche and S. Pasupathy, "A New Representation of Trellis Codes," International Conference on Communications Rec., (*ICC' 86*), pp. 1641-1645, 23-25 June 1986, Toronto, Ontario.
- [3] M. Fattouche, "Bounds for Convolutionally-encoded CPM schemes," International Conference on Communications Rec. (*ICC' 87*), pp. 1046-1050, 7-10 June 1987, Seattle, Washington.
- [4] M. Fattouche, "The Optimization of Convolutionally-encoded CPM schemes," Proc. of the IEEE Pacific RIM Conf., pp.97-100, 4-5 June 1987, Victoria, B.C.

- [5] M. Fattouche and D. Irvine-Halliday, "The Optimization of Convolutional Codes on Optical Fiber", Supercomputing Symposium (SS' 87), pp. 209-222, Calgary, Alberta, June 15-16 1987.
- [6] M. Fattouche, "Linearized Continuous Phase Modulation," Proc. of the IEEE Pacific Rim Conf., pp. 329-333, June 1989, Victoria, B.C.
- [7] M. Fattouche, "Quadrature Linearized Continuous Phase Modulation," Canadian Conf. on Electrical and Computer Eng., pp. 98-101, Sept. 1989, Montreal, Quebec.
- [8] M. Jorgenson, M. Fattouche and S.T. Nichols, "An Adaptive Minimum Redundancy Array for Digital Communications," Canadian Conf. on Electrical and Computer Eng., pp. 1136-1139, Sept. 1989, Montreal, Quebec.
- [9] M. Fattouche, L. Petherick and A. Fapojuwo, "Simulation of an Urban Mobile Radio Channel on the Myrias SPS-2," poster session at 5th Distributed Memory Computing Conference, April 9-12, 1990, Charleston, S.C.
- [10] M. Fattouche, L. Petherick and A. Fapojuwo, "Diversity for Mobile Radio Communications," 15th Biennial Symposium on Communications, pp. 196-199, June 3-6, 1990, Kingston, Ont.
- [11] M. Fattouche, L. Petherick and A. Fapojuwo, "Simulation of a Cellular Access Digital Network on the Myrias SPS-2," Supercomputing Symposium (SS'90), June 4-6, 1990, Montreal, Quebec.
- [12] H. Zaghoul, G. Morrisson, M. Fry and M. Fattouche, "Measurements of the Frequency Response of the Indoor Channel," 33rd Midwest Symposium on Circuits & Systems, pp. 405-407, Aug. 12-14, 1990, Calgary, Alta.
- [13] M. Fattouche, G. Morrisson, H. Zaghoul and L. Petherick, "Diversity for Indoor Radio Communications," 33rd Midwest Symposium on Circuits & Systems, pp. 415-417, Aug. 12-14, 1990, Calgary, Alta.
- [14] B. Olasz, K. Scott, M. Fattouche and S. Nichols, "Antenna Diversity in FM Cellular Radio," IEEE Pacific Rim Conference on Communications, Computer and Signal Processing, pp. 526-529, May 9-10, 1991.
- [15] G. Morrisson, H. Zaghoul, M. Fattouche and M. Smith, "Indoor Digital Radio Propagation Studies with ARMA Modelling," IEEE Pacific Rim Conference on Communications, Computer and Signal Processing, pp. 71-74, May 9-10, 1991.
- [16] P. Goud, A. Sesay and M. Fattouche, "A Spread Spectrum Radio Location Technique and its Application to Digital Cellular Radio," IEEE Pacific Rim Conference on Communications, Computer and Signal Processing, pp. 661-664, May 9-10, 1991.
- [17] G. Morrisson, H. Zaghoul, M. Fattouche and D. Tholl, "Frequency Measurements of the Indoor Channel," Proceedings of Wireless'91, Calgary, Alberta, Canada, July 8-10, 1991.
- [18] G. Morrisson, M. Fattouche and D. Tholl, "ARMA Modeling and Spectral Estimation of the Indoor Radio Propagation Channel," Proceedings of *Wireless'92*, Calgary, Alberta, Canada, July 8-10, 1992.
- [19] M. Fattouche and H. Zaghoul, "Estimation of the phase differential over fading channels," The third IEEE International Symposium on *Personal, indoor and mobile radio communications*, Boston, Ma, October 19-21, 1992.
- [20] M. Fattouche and H. Zaghoul, "Error Reduction of MPSK Signals transmitted over Flat-Fading channels," Second *Virginia Tech Symposium on Wireless Personal Communications*, Blacksburg, Virginia, June 17-19, 1992.



- [21] M. Fattouche and H. Zaghoul, "Equalization of  $\pi/4$  offset DQPSK transmitted over flat fading channels," *ICC'92*, Chicago, Ill., June 14-18, 1992.
- [22] M. Fattouche and H. Zaghoul, "The z-domain zeros, Theory and Application to the Fading Channel," Third *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications*, Boston, Massachusetts, October 19-21, 1992.
- [23] G. Morisson, H. Zaghoul and M. Fattouche, "Statistical Analysis and Autoregressive Modeling of the Indoor Radio Propagation Channel," First Symposium on *Personal Communication Networks*, Dallas, Texas, September 1992.
- [24] R. Klukas and M. Fattouche, "Radio Signal Direction Finding in the Urban Radio Environment," 1993 National Technical Meeting, *Institute of Navigation*, San Francisco, California, January 20-22, 1993.
- [25] M. Fattouche and H. Zaghoul, "A New Equalization Technique for Wideband OFDM over a Selective Fading Channel," Third *Virginia Tech Symposium on Wireless Personal Communications*, Blacksburg, Virginia, June 16-17, 1993.
- [26] M. Fattouche and H. Zaghoul, "Error Reduction of Coded MPSK over a Flat Fading Channel," *Canadian Workshop on Information Theory*, June 1-2, 1993.
- [27] M. Fattouche and H. Zaghoul, "Virtual Angle Diversity," Proceedings of *ICUPC'93*, Ottawa, Ontario, Canada, October 12-15, 1993.
- [28] D. Tholl and M. Fattouche, "Angle of Arrival Analysis of the Indoor Radio Propagation Channel," Proceedings of *ICUPC'93*, Ottawa, Ontario, Canada, October 12-15, 1993.
- [29] M. Fattouche and H. Zaghoul, "Error Reduction of Coded DPSK over a Fading Channel Using the Hilbert Transform," Proceedings of *Wireless'93*, Calgary, Alberta, Canada, July 12-14, 1993.
- [30] D. Tholl and M. Fattouche, "The Effect of the Antenna Pattern on RMS Delay Spread and Path Loss of Indoor Radio Propagation Channels," Proceedings of *Wireless'93*, Calgary, Alberta, Canada, July 12-14, 1993.
- [31] G. Morisson and M. Fattouche, "Super Resolution Modeling of the Indoor Radio Propagation Channel," Proceedings of *Wireless'93*, Calgary, Alberta, Canada, July 12-14, 1993.
- [32] G. Morisson and M. Fattouche, "Modeling of the Radio Propagation Channel: A Comparison Method," Proceedings of *SEACOM'94*, Kuala Lumpur, Malaysia, Oct. 3-6, 1994.
- [33] L. Dumont, M. Fattouche and G. Morrison, "Superresolution of discrete arrivals in a spread spectrum system," Proceedings of *Wireless'94*, Calgary, Alberta, Canada, July 11-13, 1994.
- [34] B. Donaldson, M. Fattouche and R. Donaldson, "In-Building Wireless Radio Channel Characterization based on Energy Measurements and the Hilbert Transform," *IEEE Pacific Rim Conference on Communications, Computer and Signal Processing*, pp. 224-229, May 19-20, 1995.
- [35] A. Borsodi and M. Fattouche, "Super Resolution of Discrete Arrivals in a Position Location Cellular System," Proceedings of *Wireless'95*, Calgary, Alberta, Canada, July 10-12, 1995.
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- [43] Z.L. Shi, W. Tan and M. Fattouche, "A Novel direct sequence spread spectrum wireless modem based on frequency modulation," Proceedings of 1996 Canadian Conference on Electrical and Computer Engg., Calgary, Alberta, May 26-29, 1996.
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- [65] X. Guan, D. Wang and M. Fattouche, "Wireless-enabled GPS Indoor Geolocation System Using Optimal Multi-Carrier Signal," Proc. of *IEEE MAPE 2011 Conf.*, 2011.
- [66] M.P. Mintchev, M.G. Deneva, O. Yadid-Pecht, M. Fattouche, and R.C. Bray, "Pseudofood (Temporary Controllable Gastric Pseudobezoars) as an Alternative to Intra-gastric Balloons for the Treatment of Obesity: Results from a Chronic Human

- Study,” presented in: *28th Int Conference Obesity 2010*, San Diego, CA, USA, October 8-12, 2010.
- [67] M.G. Deneva, A. Marintchev, O. Yadid-Pecht, M. Fattouche, R.C. Bray, M.P. Mintchev, “Temporary Controllable Pseudobezoars: Non-Invasive Alternative to Surgical Gastric Volume Reduction for the Treatment of Obesity,” *Digestive Disease Week (DDW) 2012*, San Diego, CA, USA, May 19 - 22, 2012.
- [68] Y. Lu, D. Wang and M. Fattouche, “Novel spectrum sensing scheme in cognitive radio by simultaneously sensing/transmitting at full-duplex Tx and BER measurements at Rx,” *IEEE 25<sup>th</sup> PIMRC*, September 2-5, 2014, Washington D.C.
- [69] Y. Lu, P. Zhu, D. Wang and M. Fattouche, “Machine learning techniques with probability vector for cooperative spectrum sensing in cognitive radio networks,” *IEEE Wireless Communications and Networking Conference*, April 3-6, 2016, Doha Qatar.
- [70] D. Wang, M. Fattouche and F.M. Ghannouchi, “Bounds of mmWave-based ranging and positioning in multipath channels,” *Proc. of IEEE Globecom workshops*, November 28-29, December 4-8, 2017, Singapore.
- [71] D. Wang, M. Fattouche and F.M. Ghannouchi, “Energy-efficient localization with OFDM transmission in multipath channels,” *Proc. of IEEE Asia Pacific Conference on Wireless and Mobile*, November 28-29, 2017, Bandung Indonesia.
- [72] D. Wang, M. Fattouche and F.M. Ghannouchi, “Network-managed localization protocol for Wimax,” *Proc. of IEEE Asia Pacific Conference on Wireless and Mobile*, November 28-29, 2017, Bandung Indonesia.
- [73] D. Wang, M. Fattouche and F.M. Ghannouchi, “Bounds of mmWave-based ranging and positioning with massive uniform rectangular array,” *Proc. of IEEE CCECE*, May 13-16, 2018, Quebec City, Quebec.

### iii) Posters:

- [1] M.P. Mintchev, M.G. Deneva, B. I. Aminkov, O. Yadid-Pecht, M. Fattouche, R.C. Bray, “Pilot Studies of Temporary Controllable Gastric Pseudobezoars (Pseudofood) as an Alternative to Bariatric Surgery for the Treatment of Obesity,” *DDW*, May 2010.
- [2] M.P. Mintchev, M.G. Deneva, O. Yadid-Pecht, M. Fattouche, R.C. Bray, “Pseudofood (Temporary Controllable Gastric Pseudobezoars) as an Alternative to Intragastric Balloons for the Treatment of Obesity: Results from a Chronic Human Study,” *The Obesity Society’s 2010 Annual Scientific Meeting*, San Diego, Oct. 2010.

### iv) Citation:

- [1] M.P. Mintchev, M.G. Deneva, B.I. Aminkov, M. Fattouche, O. Yadid-Pecht, R.C. Bray, “Pilot study of temporary controllable gastric pseudobezoars for dynamic non-invasive gastric volume reduction,” *Obesity Research Today*, vol. 7, issue 1, Jan. 2010.
- [2] S. Hasty, “Data on life sciences described by researchers at University of Calgary, Center for Bioengineering,” *Life Sciences Weekly*, March 16<sup>th</sup> 2010.

### v) Completed Ph.D. Theses under my Supervision:

- [1] M. Hosseinian, “Multiuser Detection for CDMA,” Ph.D. Thesis, Dept of Electrical & Computer Engg., Univ. of Calgary, 1999.
- [2] K. Fallahi, “Robust Positioning and Optimization Techniques in Mobile Robotic Networks,” The University of Calgary, AB, Canada, January 2011.

- [3] R. Klukas, "A superresolution based cellular positioning system using GPS time synchronization," Ph.D. Thesis, Dept of Geomatics Engg., Univ. of Calgary, 1997.
- [4] G. Morrison, "Super Resolution Modeling of the Indoor Radio Propagation Channel," Ph.D. thesis, University of Calgary, AB, Canada, March 2000.
- [5] C. Botteron, "A Statistical Analysis of the Performance of Radio Location Techniques," Ph.D. thesis, University of Calgary, AB, Canada, March 2003.
- [6] M. Youssef, "A Cross-Layer Design for Wireless Location," Ph.D. Thesis, Dept. of ECE, The University of Calgary, AB, Canada, Dec. 2008.
- [7] D. Wang, "Multicarrier Transmission for Wireless Location: Range Estimation and Positioning," The University of Calgary, AB, Canada, July 2010.
- [8] S. Wei, "Signal Estimation and Detection of Highly Correlated Signals in Noise: Theory and Applications," The University of Calgary, AB, Canada, September 2011.
- [9] G. Zhao, "A Novel OFDM-Based Wireless Positioning Protocol for Cellular Networks," Dalian University of Technology, China, 2011.

**vi) Completed M.Sc. Theses under my Supervision:**

- [1] Saika Sharmeen, "Motion Detection Using Estimator Correlator in Outdoor Multipath Environment," (M.Sc.), 2008.
- [2] Andrew Borsodi (M.Sc.)
- [3] Hany Shenouda (M.Sc.)
- [4] William Wong (M.Sc.)
- [5] J. Sheffeidine, "Performance Modeling of eMoM," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1999.
- [6] M. Chow, "Low Complexity CSK over the Wireless Channel," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1999.
- [7] G. Messier, "IS-95 Cellular Mobile Location Techniques," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1998.
- [8] J. Peng, "Implementation of a Peer-to-Peer Wireless System," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1998.
- [9] K. Hung, "A Novel low-complexity IF-sampling receiver," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1996.
- [10] W. Lee, "Peer-to-peer Wireless system," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1996.
- [11] J. Sokolosky, "Implementation of Smart Radio Modem Protocols," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1996.
- [12] D. Tholl, "Characterization of the UHF Indoor Radio Propagation Channel," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1995.
- [13] W. Tan, "BER Reduction of DSSS over Flat Fast Fading Channels," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1995.
- [14] S. Kularatna, "Superresolution of Discrete Arrivals in a Spread Spectrum System," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1995.
- [15] S. Buchholz (Dipl.-Ing. Elektrotechnik), "Implementation and Testing of a DS/SS-DMPSK System," Department of Electrical Engineering, Universität Erlangen-Nürnberg, 1994.
- [16] L. Dumont, "Superresolution of Discrete Arrivals in a Spread Spectrum System," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1994.

- [17] B. Donaldson, "Frequency Response Phase Estimation of the UHF Indoor Communications Channel," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1993.
- [18] R. Klukas, "Angle of Arrival Estimation in the Outdoor Radio Environment," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, 1993.
- [19] G. Morrison, "Frequency Measurements of the Indoor Radio Channel," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, Dec. 1991.
- [20] P.A. Goud, "A Spread Spectrum Radiolocation Technique and its Application to Cellular Radio," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, Sept. 1991.
- [21] E. Olasz, "Antenna Diversity in Analog FM Cellular Radio," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, July 1991.
- [22] H. Zhang, "A New Fading Model for Digital Mobile Communications," M.Sc. Thesis, Dept of Electr. & Computer Eng., Univ. of Calgary, July 1991.
- [23] M. Jorgenson, "Adaptive Beamforming with a Minimum Redundancy Array," M.Sc. Thesis, Dept of Electr. Eng., Univ. of Calgary, Feb. 1989.

**vii) Completed M.Eng. Students:**

- [1] Syed Rizvi, Dept. of ECE, The University of Calgary, 2008.
- [2] Ailin Zhu, Dept. of ECE, The University of Calgary, 2007.
- [3] S. O'Connell, M.Eng. (courses only), Department of Electrical Engineering, The University of Calgary, 1988.
- [4] Hian Leong (M.Eng.) (courses only), Department of Electrical & Computer Engineering, The University of Calgary, 1997.

**vi) Technical Reports**

- [1] Mintchev, M.G. Deneva, M. Fattouche, O. Yadid-Pecht, R.C. Bray, M.P. Mintchev, "Temporary Controllable Pseudobezoars as a Non-Invasive Alternative to Surgical Gastric Volume Reduction for the Treatment of Obesity," Clinical Trial Report for Zalak-B, 2010.
- [2] M. Fattouche, H. Zaghloul, P. Milligan and D. Snell, "Low complexity Code shift keying," Technical Report to Wi-LAN Inc., Report no. 95 07 MF2, July 1995.
- [3] M. Fattouche, [Classified] , Technical Report to Wi-LAN Inc., Report no. 93 02 MF1, Feb. 1993.
- [4] M. Fattouche and H. Zaghloul, "A New High Capacity Multiple Access Technique for Wireless Communication," Technical Report to AGT, Report no. 69 CM 91 FZ, July 1991.
- [5] M. Fattouche and H. Zaghloul, "A 150 Mbps Data Transmission over The Indoor Wireless Channel," Technical Report to AGT, July 1991.
- [6] M. Fattouche, "Channel Measurement Guidelines for Digital Land Mobile Communications," Technical Report to Alberta Government Telephones, Report no. 65 CM 90 MF, March 1990.
- [7] M. Fattouche and S.T. Nichols, "Radio Channel Simulator," Internal Report to NoVatel Communications Ltd, June 1989.
- [8] M. Fattouche and E.J. Krakiwsky, "Assessment of the impact of Mobile Communications Technologies on Canadian Navigations," Chapter 8 of the Technical Report to Transport Canada, Jan. 1990.

### vii) Contributions/Chapters in Books

- [1] M. Fattouche and H. Zaghoul, "Error Reduction of DMPSK transmitted over Flat Fading Channels," pp. 159-174 in *Wireless Personal Communications*, edited by M.J. Feuerstein and T.S. Rappaport, published by Kluwer Academic Publishers, 1992.
- [2] M. Fattouche and H. Zaghoul, "A New Equalization Technique for Wideband OFDM over a Selective Fading Channel," in *Advances in Wireless Communications*, published by Kluwer Academic Publishers, 1993.
- [3] M. Fattouche and H. Zaghoul, "Error Reduction of coded MPSK transmitted over a Flat Fading Channel," *Proceedings of Canadian Workshop on Information Theory*, Springer-Verlag, 1994.

### viii) Research Awards

Wi-LAN won the 1998 **ASTECH** Award for "Small Business."

Wi-LAN was one of four finalists for the 1997 **ASTECH** Award for "Small Business."

Was one of four finalists for the 1996 **ASTECH** Award for "Outstanding Leadership in Alberta Technology".

Wi-LAN won the 1993 Electronics Industries Association of Alberta (**EIAA**) "Award for best technology".

### ix) Research Grants Held

NSERC Collaborative Research & Development Grant, "Intelligent Information Infrastructure for Wireless Multi-Sensor Motes Applications," \$429,000 (2005-2206).

TR Labs Graduate Student Scholarship, \$40,000 (1997-1998).

Wi-LAN Scholarship, \$18,000 (1997-1998).

NSERC Operating Grant, "High Speed Spread Spectrum Modem," \$18,500 (1996-2000).

Micronet Scholarship, \$5,000 (1996-1997).

Wi-LAN Scholarship, \$5,000 (1996-1997).

NRC IRAP Grant, "Wireless Location of Cellular Telephones," \$30,000 (1996).

TR Labs Graduate Student Scholarship, \$30,000 (1996-1997).

TR Labs Graduate Student Scholarship, \$36,000 (1995-1996).

TR Labs Summer Student, \$4,000 (Summer 1996).

TR Labs Graduate Student Scholarship, \$54,000 (1994-1995).

TR Labs Summer Student, \$4,000 (Summer 1994).

AMC, "A High Speed A-to-D with 10 bit precision," \$6,000 (1994-1995).

TR Labs Graduate Student Scholarship, \$42,000 (1993-1994).

Wi-LAN, "A low Data Rate Spread Spectrum Transceiver," \$12,000 (1993-1994).

Wi-LAN, "A low Data Rate Spread Spectrum Transceiver," \$12,000 (1993-1994).

AMC, "A High Speed A-to-D with 10 bit precision," \$6,000 (1993-1994).

Datek, "48 Mbps Wireless LAN," \$440,000 (1992-1993).

TR&T, "48 Mbps Wireless LAN," \$229,000 (1992-1993).

NRC IRAP Grant, "48 Mbps Wireless LAN," \$238,000 (1992-1993).

NSERC Operating Grant, "Modeling of the Indoor Radio Channel up to 50 GHz," \$13,000 (1993-1995).

NSERC Senior Industrial Fellowship, \$10,600 for the sabbatical year 1992-1993 at AGT.

NSERC Equipment Grant, "High Frequency Network Analyzer," \$98,000 (1992-1993), R. Johnson, M. Fattouche, A. Sesay, S. Nichols, J. Gu.

NSERC Operating Grant, "Modeling of the Indoor Radio Channel over the 3-20 GHz band," \$15,000 (1992-1993).

AGT R&D, "Traffic and System Simulation of the Indoor Radio Channel," \$24,000 (1991-1993).

TR Labs Graduate Student Scholarship, "Radio Location in Cellular Radio using Narrowband signaling," \$12,000 (1992-1993).

TR Labs Graduate Student Scholarship, "Modeling of the Microcellular Radio Channel using an Impulse Response Measurement System," \$24,000 (1992-1993).

TR Labs Graduate Student Scholarship, "Modeling of the Indoor Radio Channel with High Order Statistics," \$24,000 (1992-1993).

NovAtel R&D Scholarship, "Space Diversity over the Wireless Channel," \$12,000 (scholarship) + \$3,000 (equipment) (1990-1991).

AGT R&D Scholarship, "Modeling of the Indoor radio Communications Channel," \$15,000 (scholarship) + \$3,000 (equipment) (1990-1991).

ATRC Graduate Student Scholarship, "A Direct Sequence Position Location System and its Application to Cellular Radio," \$12,000 (1989-1991), A. Sesay & M. Fattouche.

ATRC Graduate Student Scholarship, "Frequency Domain Characterization of the Indoor Channel," \$24,000 (1989-1991).

ATRC Post-Doctoral Fellowship, "Simulation of a Digital Mobile Radio Channel," \$20,000 (1989).

NSERC Operating Grant, "Optimization of Combined Coding and Modulation," \$30,000 (1987-1990).

University of Calgary Strater Grant, "Implementation of Linearized CPM," \$3,400 (1987).

Alberta Manpower STEP grant for one summer research assistant for work on "Adaptive Equalization on Selective Fading Channels," \$3,557, (1987).

#### **x) Examining Committees:**

Mohamed Elseri, Ph.D. Candidacy, UofC, Date of defense: 2011.

Kelly Gross, Ph.D. Candidacy, UofC Date of defense: 12/12/2008.

Yigiter Yuksel, Ph.D. Candidacy, UofC, Date of defense: 03/02/2009.

Ahmed Zaki, Ph.D. Candidacy, UofC, Date of defense: 05/27/2008.

Priyanka Aggarwal, Ph.D. Thesis Title: Development of Particle Filter Techniques for the fusion of Multisensor data," UofC, Date of defense: 02/27/2009

Siva Muruganathan, Ph.D. Thesis Title: "Computationally-efficient Receiver Design for OFDM Systems with Space-Frequency diversity," UofC, Date of defense: 11/19/2008.

Alejandra Cano Tinoco, M.Sc., Thesis Title: QOS Routing of Wireless Sensor Networks," UofC, Date of defense: 12/17/2007.

Michael Lam, M.Sc. Thesis Title: Diamagnetically-Stabilized Levitation Control of an Intraluminal Magnetic Capsule," UofC, Date of defense: 10/22/2007.

Mohamed Youssef, Ph.D., Thesis Title: "A Cross-Layer Design for Wireless Location," University of Calgary, Date of defense: 11/12/2008.

Saika Sharmeen, M.Sc. Thesis Title: , University of Calgary, Date of defense: 09/15/2009.

Shamsul Alam, M.Sc. Thesis Title: "An Analytical Characterization of Broadcast Relay Networks," UofC, Date of defense: 06/08/2009.



- Saloomeh Abbasiannik, M.Sc. Thesis Title: "Multichannel Dual Frequency GLONASS Software Receiver in Combination with GPS L1 C/A," UofC, Date of defense: 3/19/2009.
- Donglin Zhang, Ph.D. Candidacy Exam, Department of Electrical & Computer Engineering, The University of Calgary, 2008.
- J. Shaffaeiddine, M. Sc. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1999.
- M. Chow, M. Sc. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1999.
- G. Messier, M. Sc. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1998.
- J. Peng, M. Sc. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1998.
- R. Klukas, Ph.D. Examination Committee member, Department of Geomatics Engineering, The University of Calgary, 1997.
- Hian Leong, M.Eng. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1997.
- K. Hung, M. Sc. Examination Committee Chairman, Department of Electrical & Computer Engineering, The University of Calgary, 1996.
- N. Sexton, M. Sc. Examination Committee member, Department of Electrical & Computer Engineering, The University of Calgary, 1996.
- H. Lan, M. Sc. Examination Committee member, Department of Geomatics Engineering, The University of Calgary, 1996.
- N. Hayashi, M. Sc. Examination Committee member, Department of Geomatics Engineering, The University of Calgary, 1996.
- J. Sokolosi, M.Sc. Examination Committee Chairman, Dept of Electrical and Computer Engineering, The University of Calgary, 1996.
- W. Lee, M.Sc. Examination Committee Chairman, Dept of Electrical and Computer Engineering, The University of Calgary, 1996.
- P. Graumann, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1996.
- B. Olasz, Ph.D. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1996.
- K. Chau, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1996.
- M. Hosseinian, Ph.D. Candidacy Examination Committee Chairman, Department of Geomatics Engineering, The University of Calgary, 1995.
- R. Klukas, Ph.D. Candidacy Examination Committee member, Department of Geomatics Engineering, The University of Calgary, 1995.
- D. Tholl, M.Sc. Examination Committee Chairman, Dept of Electrical and Computer Engineering, The University of Calgary, 1995.
- W. Tan, M.Sc. Examination Committee Chairman, Dept of Electrical and Computer Engineering, The University of Calgary, 1995.
- S. Kularatna, M.Sc. Examination Committee Chairman, Dept of Electrical and Computer Engineering, The University of Calgary, 1995.

- G. Morrison, Ph.D. Candidacy Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- S. Uz Zaman, M.Sc. Examination Committee member, Department of Electrical Engineering, University of Technology, Sydney, Australia, 1994.
- G. Funk, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- H. Sun, M.Sc. Examination Committee member, Department of Geomatics Engineering, The University of Calgary, 1994.
- R. Klukas, Ph.D. Supervisory Committee member, Department of Geomatics Engineering, The University of Calgary, 1994.
- B. Ebel, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- M. Gibbard, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- R. Karmacharya, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- L. Dumont, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- K. Lau, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1994.
- W. Qiu, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- R. Klukas, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- B. Donaldson, M.Eng. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- E. Beissenger, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- E. Patton, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- M. Yang, Ph.D. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- J. McRory, "An RF Feedback Amplifier for Low Intermodulation Distortion Performance," Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- N. Li, "Performance Analysis of Multiplexers and Token Ring Networks with Integrated Data/Voice Traffic," Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- R. Klukas, "Angle of Arrival Estimation in the Outdoor Radio Environment," Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- B.L. Hou, M.Eng. (courses only), Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- B. Donaldson, "Frequency Response Phase Estimation of the UHF Indoor Communications Channel," Department of Electrical and Computer Engineering, The University of Calgary, 1993.
- M. Douglas, "Dual Diversity Antennas for Hand-Held Radios," Department of Electrical and Computer Engineering, The University of Calgary, 1993.

- K. Chia, "An Alternative to Direct Sequence Spread Spectrum Multiple Access System Using Optimized Waveshaping," Department of Electrical and Computer Engineering, The University of Calgary, 1992.
- A. Morshed, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1992.
- G. Morrison, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- P. Goud, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- B. Olasz, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- H. Zhang, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- M. Jorgensen, M.Sc. Examination Committee Chairman, Department of Electrical and Computer Engineering, The University of Calgary, 1989.
- R. Nagalla, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- K. Scott, Ph.D. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- M. Gilany, Ph.D. Candidacy Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- D. Shaw, M.Eng. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- T. Deng, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- S. Tavathia, M.Sc. Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1991.
- J. Siu-Luen, Ph.D. Candidacy Examination Committee member, Department of Physics, The University of Calgary, 1990.
- K. Scott, Ph.D. Candidacy Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1990.
- M. Yang, Ph.D. Candidacy Examination Committee member, Department of Electrical and Computer Engineering, The University of Calgary, 1990.
- B. Davies, M.Sc. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1989.
- T. Smit, M.Sc. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1989.
- S. O'Connell, M.Eng. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1988.
- K.H. Lau, M.Sc. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1988.
- A. Soukaria, M.Sc. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1987.
- Z. Pal, M.Eng. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1987.

A. Itani, M.Sc. Examination Committee member, Department of Electrical Engineering, The University of Calgary, 1986.

**xi) Supervision of Staff:**

Donglin Wang, Post-Doctoral Fellow, Department of Electrical and Computer Engineering, July 2010 to July 2011.

Saeed Kholeissani, Post-Doctoral Fellow, Cell-Loc Location Technologies, Dec. 2007 to Dec. 2009.

Mohamed Youssef, Post-Doctoral Fellow, Department of Geomatics Engineering, The University of Calgary, Dec. 2008 to Dec. 2009.

Yubin Zhu, Post-Doctoral Fellow, Department of Electrical and Computer Engineering, The University of Calgary, 1995 to 1997.

W. Wong, Summer Student, TRILabs, Calgary, 1996.

K. Hung, Summer Student, TRILabs, Calgary, 1994.

S. Chang, Summer Student, TRILabs, Calgary, 1994.

B. Donaldson, Research Assistant, Department of Electrical and Computer Engineering, The University of Calgary, 1993.

D. Tholl, Summer Student, TRILabs, Calgary, 1991.

K. Chia, Summer Student, TRILabs, Calgary, 1990.

A. Fapojuwo, Post-Doctoral Fellow, Department of Electrical and Computer Engineering, The University of Calgary, 1989.

M. Jorgensen, Research Assistant, Department of Electrical and Computer Engineering, The University of Calgary, 1989.

M. Ghoulaïmany, Summer Student, Department of Electrical and Computer Engineering, The University of Calgary, 1987.

**xii) Supervisory Committee membership:**

Yigiter Yuksel, Ph.D., Date of defense: 2010.

Mohamed Youssef, Ph.D., Date of defense: 2009.

Mohamed Elseri, Ph.D., Date of defense: 2011.

Kia Fallahi, Ph.D., Date of defense: 2011.

Donglin Zhang, Ph.D., Date of defense: 2010.

Ahmed Zaki, Ph.D., Date of defense: 2010

**xii) Other scholastic Activities:**

- [1] Technical Program Committee member for the 3rd Annual Conference on Communication Networks and Services Research (CNSR-2005) held in May 2005 in Halifax, Nova Scotia.
- [2] Industry Meet and Greet at The University of Calgary, Several Local and International Industries were represented, UofC, The ECE Graduate Student Association, 05/07/2009.
- [3] Technical Program Committee member for VTC2008 - Vehicular Technology Conference, held in Sept. 2008 in Calgary, Alberta.
- [4] Panel Discussion, Member, for VTC2010 – Vehicular Technology Conference, held in Sept. 2010 in Ottawa, Ontario.

## TEACHING CONTRIBUTIONS:

### Teaching Awards

Awarded the 2005 "**Teaching Excellence Award**," for Electrical and Computer.

Awarded the 1996 "**Teaching Excellence Award**," for Electrical and Computer.

Nominated to the **1992 "Students Union Teaching Excellence Award."**

### Undergraduate Courses at the University of Calgary:

ENEL 583 "Team Design Project, Part A" four years: 2005-2009.

ENEL 589 "Team Design Project, Part B" four years: 2005-2009.

ENEL 571 "Digital Communications" (lecturer and Tutorial Assistant), five years, (teaching evaluation: 2.7 in 1993, 2.8 in 1994, 3.4 in 1995, 1996, 1997).

ENEL 327 "Signals and Systems" (Lecturer and Tutorial Assistant), two years, (teaching evaluation: 3.2 in 1995, 3.2 in 1996).

ENGG 303 "Electrical Circuits and Machines" (Lecturer and Tutorial Assistant), two years, (teaching evaluation: 4.1 in 1992).

ENEL 599 "Electrical and Computer Eng. Project" (Supervisor), three years, 1994: one student, 1995: One student, 1996: four students.

PHYS 259 "Electricity and Magnetism" (Tutorial Assistant), six years.

PHYS 269 "Acoustics, Optics and Radiation" (Tutorial Assistant), four years.

AMAT 309 "Mathematics for Engineers" (Tutorial Assistant), one year.

ENGG 213 "Engineering Computation" (Lab Assistant), one year.

ENEL 325 "Circuits and Systems" (Lab Assistant, Tutorial Assistant), one year.

### Graduate Courses at the University of Calgary:

ENEL 625 "Estimation Theory", five years: 2003-2009

ENEL 619.79 "Wireless Location", one year: 2009.

ENEL 619.34 "MIMO OFDM", one year: 2008.

ENEL 675 "Introduction to Data Communications" (Lecturer and Tutorial Assistant), nine years.

ENEL 677 "Advanced Data Communications" (Lecturer and Tutorial Assistant), seven years.

ENEL 671 "Adaptive Signal Processing" (Lecturer and Tutorial Assistant), one year.

ENEL 673 "Wireless Communications" (project coordinator), one year.

ENEL 619.83 "Statistical Digital Signal Processing" (reading course), one year.

ENEL 619.84 "Modeling with Higher Order Statistics" (reading course), one year.

ENEL 607 "Graduate Students Seminars" (Course Organizer), one year.

### Curriculum Development

[1] Developed a new undergraduate course: ENEL 327, "Signals and Systems," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1995.

[2] Developed a new graduate course: ENEL 675, "Introduction to Data Communications," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1987.

[3] Developed a new graduate course: ENEL 677, "Advanced Data Communications," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1987.

[4] Developed a new graduate course: ENEL 671, "Adaptive Signal Processing," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1988.

- [5] Developed a new graduate course: ENEL 619.83, "Statistical Digital Signal Processing," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1996.
- [6] Developed a new graduate course: ENEL 619.84, "Modeling with Higher Order Statistics," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1991.
- [7] Developed the projects for the graduate course: ENEL 673, "Wireless Communications," at the Department of Electrical and Computer Engineering, at the University of Calgary, 1989.

**Courses to the Telecommunications Industry:**

"Cellular CDMA", offered to Nortel, summer 1995.

"Digital Communications", offered to Northern Telecom, summer 1994.

"Adaptive Signal processing", offered to NovAtel, summer 1987.

**SERVICE CONTRIBUTIONS:**

**University Services:**

- [1] Member, Planning Committee, July 2009, Department Level.
- [2] Member, Budget Committee, 2008/09, Department Level.
- [3] Member, Search Committee for Geomatics Dept, 2007/09, Faculty Level.
- [4] Member, Search Committee for ECE Dept, 2006/08, Faculty Level.
- [5] Member, Centre for Research, Entrepreneurship and Applied Technology Education (CREATE), 2008/09, University Level.
- [6] Co-Chair, Academic Appeals Committee, 2008/10, Faculty Level.
- [7] Member, Academic Appeals Committee, 2005/08, Faculty Level.
- [8] Member, Schulich Scholarship, 2008, Faculty Level.
- [9] Member, General Faculty Council, 2006/08, University Level.
- [10] Member, General Faculty Council, 1995/97, University Level.
- [11] Member of Board of Directors, "The University of Calgary Engineering Endowment Foundation", 1996/97
- [12] Member, Internship Committee, 1996/97, Faculty Level.
- [13] Member, Selection Advisory Committee for "The NSERC-TR Labs Industrial Chair," 1994/95, University Level.
- [14] Member, Budget Committee, July 1988-July 1996, Department Level.
- [15] Member, Graduate Studies Committee, July 1988-July 1996, Department Level.
- [16] Member, TR Labs Agreement Review, February 1992, University Level.
- [17] Member, Selection Advisory Committee for "The NSERC-TR Labs Industrial Chair," February 1992, University Level.
- [18] Member, Academic Award Committee, July 1988-July 1991, University Level.
- [19] Member, Promotion and Award Committee, July 1988-present, Faculty Level.
- [20] Member, Student-Staff Liaison, July 1988-present, Department Level.
- [21] Member, Computing Committee, July 1990-July 1991, Department Level.
- [22] Member, Curriculum Committee, July 1989-July 1990, Department Level.
- [23] Member, NSERC International Fellowships, December 1989-July 1990, University Level.
- [24] Member, Student Appeal Committee, July 1988-July 1989, Faculty Level.
- [25] Organized the department Seminars, July 1988-July 1989, Department Level.

**External Activities:**

- [1] Member, *NSERC* - Selection Committee for Strategic Grants – 2007/09.
- [2] Chair, *NSERC* - Selection Committee for Strategic Grants – 2009.
- [3] Member, ICORE internal Review Committee, 2005-2009.
- [4] Member, Alberta Ingenuity Fund - Graduate Student Scholarship Review Committee – 2008/10.
- [5] Supervised Yves Joliat (visiting student from Switzerland) under a Swiss Research Scholarship Program, July 1996 to July 1997.
- [6] Supervised Roberto Camarillo (visiting student from Mexico) under a UNESCO Program, December 1995.
- [7] Interviewed by CTV on National News as an expert on EM emissions, March 1993.
- [8] Appeared at The Development Appeal Board as an expert on EM emissions, High River, March 1993.
- [9] Member, Thrust Committee, TR Labs, January 1988-present.
- [10] Member, Organizing Committee, Wireless'93, July 1993.
- [11] Member, Organizing Committee, Wireless'92, July 1992.
- [12] Member, Organizing Committee, Wireless'91, August 1991.
- [13] Session Chair, Wireless'94, August 1994.
- [14] Session Chair, Wireless'96, August 1996.
- [15] Session Chair, Wireless'91, August 1991.
- [16] Member, Organizing Committee, Wireless'90, July 1990.
- [17] Session Chair, Wireless'90, July 1990.
- [18] Member, Organizing Committee, "The 33rd Midwest Symposium on Circuits and Systems," August 1990.
- [19] Session Chair, The 33rd Midwest Symposium on Circuits and Systems, August 1990.
- [20] Organized "The AGT/NovAtel/ATRC/U of C Open Day," Calgary, January 1990.
- [21] Member, Organizing Committee, International Conference on Communications," IASTED, April 1990.
- [22] Took part in "The Science Enrichment Program," by supervising L. Mydlarski during Fall 1987.

**Consulting Activities**

- [1] Wi-LAN Labs Inc., San Diego, 2015-2017.
- [2] AGT Mobility, Calgary, 1996.
- [3] Northern Telecom, Calgary, 1995.
- [4] Northern Telecom, Calgary, 1994.
- [5] Cantel, Calgary, 1993.
- [6] Wi-LAN Inc., Calgary, 1992-93.
- [7] AGT Ltd, Calgary, 1992-93.
- [8] TeKneKron, Berkeley, USA, 1991.
- [9] AGT Ltd, Calgary, 1989 to 1992.
- [10] Transport Canada, Ottawa, 1988.
- [11] NovAtel, Calgary, 1987.