

Curriculum Vitae, Imad Barhumi, PhD

ADDRESS

Electrical Engineering Department-Faculty of Engineering
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RESEARCH INTERESTS

- Digital Communications, Wireless and Mobile Communications.
- Digital Signal Processing for communications
- Channel Identification and Equalization
- Space Time Processing, Multiple-Input Multiple-Output (MIMO) Systems
- Iterative processing
- Cooperative Communication
- Game theory for communication networks

ACADEMIC HISTORY

- 01/2001-09/2005** Katholieke Universiteit Leuven, Leuven-Belgium
P.h.D in Electrical Engineering September, 2005.
Thesis Adviser: Marc Moonen
Thesis Title: "**Transmission over Time- and Frequency-Selective Mobile Wireless Channels**"
- 10/1997-07/1999** University of Jordan, Amman-Jordan
M.Sc in Electrical Engineering/Telecommunications.
Mark: **3.81/4** (top 5%)
Thesis title: "**Capacity Enhancement in Cellular CDMA Systems**".
- 05/1991-06/1996** Birzeit University, Birzeit, Palestine
B.Sc. Electrical Engineering. Mark 89% (with Distinction).

WORK EXPERIENCE

- 09/2006-current** United Arab Emirates University, Al Ain, UAE, Assistant Professor, Electrical Engineering Department.

- 10/2005-08/2006** Katholieke Universiteit Leuven, Leuven-Belgium, Postdoctoral Fellowship Researcher.
- 01/2001-09/2005** Katholieke Universiteit Leuven, Leuven-Belgium, Research Assistant, SISTA.
- 09/1999-12/2000** Birzeit University, Birzeit-Palestine, Lecturer in Electrical Engineering.
- 03/1997-09/1997** Palestinian Telecommunications Company (PALTEL), Nablus-Palestine.

RESEARCH, SCHOLARLY, AND CREATIVE ACTIVITIES

a. ARTICLES IN REFEREED JOURNALS¹

- 1) **I. Barhumi**, “Turbo Equalization of Doubly Selective Channels”, *Wireless Communications and Mobile Computing (Wiley)*, 15 OCT 2012, DOI: 10.1002/wcm.2306.
- 2) **I. Barhumi**, “Soft-Output Decision Feedback Equalisation for Orthogonal Frequency Division Multiplexing over Doubly Selective Channels”, *IET Commun.* 6, 1890-1897 (2012), DOI:10.1049/iet-com.2011.0848.
- 3) MTN Qaisrani and **I. Barhumi**, “A low complexity approach to equalization for doubly selective channels” *Wireless Communications and Mobile Computing*, 2014
- 4) H. Al-Tous, and **I. Barhumi**, “Joint Power and Bandwidth Allocation for Amplify and Forward Cooperative Communications Using Stackelberg Game”, *IEEE Transactions on Vehicular Technology*, November, 2012, **accepted**.
- 5) H. Al-Tous and **I. Barhumi**, “Performance Analysis of Relay Selection in Cooperative Networks over Rayleigh Flat Fading Channels”, *EURASIP Journal on Wireless Communications and Networking*, 2012, 2012:224.
- 6) T. Qaisrani, and **I. Barhumi**, “Low-complexity equalisation of doubly selective channels for multiple-input–multiple-output transmission systems”, *IET Signal Processing*, 2013.
- 7) **I. Barhumi**, and M. Moonen, “Time-Varying FIR Equalization for MIMO Transmission over Doubly Selective Channels”, *EURASIP Advanced Signal Processing*, vol. 2010, Article ID 704350. (**Impact factor 1.015, times cited 1**)

¹ Citations and impact factor of the refereed journal papers are taken from the web of knowledge web site <http://apps.webofknowledge.com/>

- 8) **I. Barhumi**, and M. Moonen, "MLSE and MAP Equalization of Doubly Selective Channels", *IEEE Transactions on Vehicular Technology*, Volume, Vol. 58, Issue 8, Oct. 2009, pp. 4120 - 4128. (Impact factor **1.9**, times cited **6**)
- 9) **I. Barhumi**, and M. Moonen, "IQ Compensation for OFDM in the Presence of CFO and IBI", *IEEE Transactions on Signal Processing*, VOL. 55, No.1, pp. 256-266, Jan. 2007. (Impact factor **2.83**, times cited **15**)
- 10) **I. Barhumi**, G. Leus, and M. Moonen, "Equalization for OFDM over Doubly-Selective Channels", *IEEE Transactions on Signal Processing*, VOL. 54, no. 4, Apr. 2006, pp. 1445-1458. (Impact factor **2.83**, times cited **29**)
- 11) **I. Barhumi**, and M. Moonen, "Estimation and Direct Equalization of Doubly Selective Channels", *EURASIP Journal on Applied Signal Processing*, vol. 2006, Article ID 62831, 15 pages, 2006. (Impact factor **1.015**, times cited **3**)
- 12) **I. Barhumi**, G. Leus, and M. Moonen, "Time Varying FIR Equalization of Doubly-Selective Channels", *IEEE Transactions on Wireless Communications*, vol. 4, no. 1, pp. 202-214, Jan. 2005. (Impact factor **2.678**, times cited **33**)
- 13) **I. Barhumi**, G. Leus, and M. Moonen, "Time- and Frequency-Domain Per-Tone Equalization for OFDM over Doubly-Selective Channels", *Signal Processing (Elsevier)*, vol. 84/11, pp. 2055-2066, 2004. Special Section Signal Processing in Communications. (Impact factor **1.567**, times cited **29**)
- 14) **I. Barhumi**, G. Leus, and M. Moonen, "Optimal Training Design for MIMO OFDM Systems in Mobile Wireless Channels", *IEEE Transactions on Signal Processing*, pp. 1615-1624, vol. 51, no. 6, June 2003. (Impact factor **2.83**, times cited **306**)

b. REFEREED CONFERENCE PAPERS

- 1) **I. Barhumi**, "Decision Feedback Turbo Equalization for OFDM over Doubly Selective Channels", Globecom 2012 - Signal Processing for Communications Symposium (GC12 SPC)", Anaheim, CA, USA, December, 2012, *accepted*.
- 2) H. Al-Tous and **I. Barhumi**, "Resource Allocation for AF Cooperative Communications Using Stackelberg Game", The 2012 Sixth International Conference on Signal Processing and Communication Systems (ICSPCS'2012), Gold Coast, Australia, December, 2012, *accepted*.
- 3) H. Al-Tous and **I. Barhumi**, "Joint Power and Bandwidth Allocation for Multiuser Amplify and Forward Cooperative Communications Using Particle Swarm Optimization", The IEEE 13th International Workshop on Signal Processing

- Advances in Wireless Communications (SPAWC 2012), Cesme, Turkey, pp. 55-59, June, 2012.
- 4) **I. Barhumi**, "Minimum Mean Square Error Turbo Equalization of Doubly Selective Channels Using the BEM", The 11th International Conference on Information Sciences, Signal Processing and their Applications (ISSPA2012), Montreal, Canada, pp. 951-955, July, 2012.
 - 5) A. Rabee and **I. Barhumi**, "ECG Signal Classification Using Support Vector Machine Based on Wavelet Multiresolution Analysis", The 11th International Conference on Information Sciences, Signal Processing and their Applications (ISSPA'12), Montreal, Canada, pp. 1319-1323, July, 2012.
 - 6) M. Hayajneh, **I. Barhumi**, and F. Awwad, "Antenna selection algorithm for down link MIMO SDMA OFDM cellular systems," Personal Indoor and Mobile Radio Communications (PIMRC), 2010 IEEE 21st International Symposium on , pp.2450-2454, 26-30 Sept. 2010.
 - 7) **I. Barhumi** and M. Moonen, "Time-Varying FIR Decision Feedback Equalization for MIMO Transmission over Doubly Selective Channels," Global Telecommunications Conference, 2009. IEEE GLOBECOM 2009, Nov. 30 2009-Dec. 4, 2009, Honolulu, Hawaii, USA.
 - 8) **I. Barhumi** and M. Moonen, "Time-Varying FIR Equalization for MIMO Transmission over Doubly Selective Channels", Global Telecommunications Conference, 2008. IEEE GLOBECOM 2008, Nov. 30 2008-Dec. 4, 2008, New Orleans, LA, USA, page(s):1 - 5.
 - 9) **I. Barhumi** and M. Moonen, "Turbo Equalization of Doubly Selective Channels", 6th European Signal Processing Conference (EUSIPCO-2008), August 25-29, 2008, Lausanne, Switzerland.
 - 10) **I. Barhumi** and M. Moonen, "On Maximum-Likelihood Equalization of Doubly Selective Channels", the International Symposium on Signal Processing and its Applications (ISSPA'07), February 12-15, Sharjah, UAE.
 - 11) **I. Barhumi** and M. Moonen, "Frequency-Domain IQ-Imbalance and Carrier Frequency Offset Compensation for OFDM over Doubly Selective Channels", the 2006 European Signal Processing Conference (EUSIPCO-2006), September 4 - 8 2006, Florence, Italy.
 - 12) **I. Barhumi**, G. Leus and M. Moonen, "MMSE Estimation of Basis Expansion Models for Rapidly Time-Varying Channels", in the 2005 European Signal Processing Conference (EUSIPCO-2005), September 4-8, 2005, Antalya, Turkey.
 - 13) **I. Barhumi**, G. Leus and M. Moonen, "Combined Channel Shortening and Equalization of OFDM over Doubly-Selective Channels", in the IEEE 2004 International Conference on Acoustics, Speech and Signal Processing (ICASSP 2004), May 17-21, Montreal, Canada. (Invited Paper)

- 14) **I. Barhumi**, G. Leus and M. Moonen, "Frequency-domain Equalization for OFDM over Doubly-Selective Channels", in the 2004 IEEE International Conference on communications (ICC 2004), 20-24 June, Paris, France .
- 15) G. Leus, **I. Barhumi**, O. Rousseaux, and M. Moonen, "Direct Semi-Blind Design of Serial Linear Equalizers for Doubly-Selective Channels", in the 2004 IEEE International Conference on Communications (ICC 2004), June 19-24, Paris, France.
- 16) **I. Barhumi**, G. Leus and M. Moonen, "Frequency-domain Equalization for OFDM over Doubly-Selective Channels", in Sixth Baiona Workshop on Signal Processing in Communications, September 8-10, 2003, Baiona, Spain.
- 17) G. Leus, **I. Barhumi**, and M. Moonen, "Low-Complexity Serial Equalization of Doubly-Selective Channels", in Sixth Baiona Workshop on Signal Processing in Communications, September 8-10, 2003, Baiona, Spain.
- 18) **I. Barhumi**, G. Leus and M. Moonen, "Time Varying FIR Decision Feedback Equalization of Doubly-Selective Channels", in IEEE 2003 Global Communications Conference (GLOBECOM'03), San Francisco, CA, December 2003.
- 19) **I. Barhumi**, G. Leus and M. Moonen, "Time-Varying FIR Equalization of Doubly-Selective Channels", in the proceedings of the IEEE 2003 International Conference on Communications (ICC'03), 11-15 May, 2003 Anchorage, AK, USA.
- 20) G. Leus, **I. Barhumi** and M. Moonen, "MMSE Time-Varying FIR Equalization of Doubly- Selective Channels", in The IEEE 2003 International Conference on Acoustics, Speech, and Signal Processing (ICASSP'03), Hong Kong, April 6-10, 2003.
- 21) G. Leus, **I. Barhumi** and M. Moonen, "Per-Tone Equalization for MIMO OFDM Systems", in the proceedings of the IEEE 2003 International Conference on Communications (ICC'03), 11-15 May, 2003 Anchorage, AK, USA.
- 22) **I. Barhumi**, G. Leus, and M. Moonen, "Optimal training sequences for channel estimation in MIMO OFDM systems in mobile wireless channels" International Zurich Seminar on Broadband Communications, Access, Transmission, Networking (IZS02), February, 2002. Page(s): 44_1 -44_6
- 23) **I. Barhumi** and M. Moonen, "Optimal Training for Channel Estimation in MIMO OFDM Systems", ProRISC, Veldhoven, the Netherlands, 27-31, November, 2001.

Google Scholar Citation Map can be found at: <http://scholar.google.com/citations?user=1g-Xg5oAAAAJ&hl=en>

C. PRESENTATIONS AT INTERNATIONAL CONFERENCES

- 1) **Imad Barhumi**, "MMSE Turbo Equalization of Doubly Selective Channels Using the BEM", in the eleventh conference on information science, signal processing and their applications ISSPA 2012, Montreal Canada, July 2012.
- 2) **Imad Barhumi**, "ECG Signal Classification Using Support Vector Machine Based on Wavelet Multiresolution Analysis", in the eleventh conferences on information

- science, signal processing and their applications ISSPA 2012, Montreal Canada, July 2012.
- 3) **Imad Barhumi** "Time-Varying FIR Decision Feedback Equalization for MIMO Transmission over Doubly Selective Channels," Global Telecommunications Conference, 2009. IEEE GLOBECOM 2009, Nov. 30 2009-Dec. 4, 2009, Honolulu, Hawaii, USA.
 - 4) **Imad Barhumi** "Time-Varying FIR Equalization for MIMO Transmission over Doubly Selective Channels", Global Telecommunications Conference, 2008. IEEE GLOBECOM 2008, Nov. 30 2008,-Dec. 4, 2008, New Orleans, LA, USA.
 - 5) **Imad Barhumi** "Turbo Equalization of Doubly Selective Channels", 16th European Signal Processing Conference (EUSIPCO-2008), August 25-29, 2008, Lausanne-Switzerland.
 - 6) **Imad Barhumi** "On Maximum-Likelihood Equalization of Doubly Selective Channels", in the International Symposium on Signal Processing and its Applications (ISSPA'07), February 12-15, Sharjah, UAE.
 - 7) **Imad Barhumi** "Per-Tone Frequency-Domain Equalization for OFDM over Doubly-Selective Channels", in the 2004 IEEE International Conference on Communications (ICC 2004), Paris, France.
 - 8) **Imad Barhumi** "Direct Semi-Blind Design of Serial Linear Equalizers for Doubly-Selective Channels", in the 2004 IEEE International Conference on Communications (ICC 2004), Paris, France.
 - 9) **Imad Barhumi** "Time Varying FIR Decision Feedback Equalization of Doubly-Selective Channels", in the IEEE Global Telecommunications Conference (GLOBECOM'03), December 2003, San Francisco, CA, USA.
 - 10) **Imad Barhumi** "Time Varying FIR Equalization of Doubly-Selective Channels" , in the proceedings of the IEEE 2003 International Conference on Communications (ICC'03), 11-15 May, 2003 Anchorage, AK, USA.
 - 11) **Imad Barhumi** "Optimal training sequences for channel estimation in MIMO OFDM systems in mobile wireless channels" International Zurich Seminar on Broadband Communications, Access, Transmission, Networking (IZS02), February, 2002, Zurich, Switzerland.
 - 12) **Imad Barhumi** "Optimal Training for Channel Estimation in MIMO OFDM Systems", ProRISC, 27-31, November, 2001, Veldhoven, the Netherlands.

d. INVITED TALKS

- 1) Optimal Training for MIMO OFDM Systems in Mobile Wireless Communication Channels.
IUAP Motion day, UCL, Belgium, June 13, 2002.
ProRISC, 27-31, November, 2001, Veldhoven, the Netherlands.
- 2) Time Varying FIR Equalization of Doubly-Selective Channels.

- IUAP Motion day, Gent University, Belgium, Oct. 22, 2002.
- 3) Transmission over Time- and Frequency Selective Channels.
IUAP Motion day, Gent University, Belgium, Jan. 13, 2005.
Philips Campus, Eindhoven, the Netherlands July, 2005.

e. GRADUATE STUDENTS

PhD:

2010-present: Hanan Altous (MSc. University of Jordan), PhD topic: “Cooperative Communication and Multi-user Diversity”.

f. EXTERNAL AND INTERNAL RESEARCH GRANTS

- 1) A PI in a 20k AED research grant from the United Arab Emirates University Research Affairs. The project title is “Iterative processing for transmission over time- and frequency-selective mobile wireless channels”. Finished March 2010.
- 2) A PI UAEU Research affairs Individual grant title “Automatic License Plate Identification for UAE”, amount 20,000 AED, ongoing
- 3) A Co-PI in a research seed from UAE University title “Emergency Alert and Navigation in absence of GPS Systems”, amount 26,600 AED, on-going.
- 4) A Co-PI in an NRF proposal title “CMOS Based Implantable Biosensor integrated with Nano-layers of Biomaterials for Continuous-time Glucose Monitoring”. 250,000AED, ongoing
- 5) A PI in an ICT Fund title “Narrow band interference cancellation in MIMO-OFDM systems using compressed sensing”, submitted to ICT funds December 2011. Estimated amount (~750,000 AED).

TEACHING EXPERIENCE

a. MAJOR COURSES TAUGHT AT UAE UNIVERSITY

1. Communication Theory ELEC 441: F06, S07, F07
2. Digital Telephony ELEC 544: F06
3. Signals and Systems ELEC 360: S07, S08
4. Fundamentals of Communication Systems ECOM 360: S08, S09
5. Digital Communication Systems ELEC 540, ECOM 422: F08, S09, S10
6. Digital Signal Processing ECOM 451: F09, F10, F11, F12
7. Information Theory and Coding ECOM 561: F09
8. Digital Signal Processing Laboratory ECOM 461: F09, F10, F11
9. Graduation Project ELEC585, ELEC590: S07, S08, S09, S10
10. Communication Systems Laboratory ECOM 402: S09, S10
11. Electric Circuits I Laboratory ELEC 310: F07
12. Signals and Systems II CSEB 420: F06

13. Advanced Digital Signal Processing ELEC 604: F10, F11,F12 (**graduate course in the EE-MS program**)

b. TEACHING AT OTHER UNIVERSITIES (BIRZEIT UNIVERSITY)

- Engineering Electromagnetics
- Signals and systems
- Probability and Engineering Statistics

c. DEVELOPMENT OF CURRICULA

- Update and modify the course objectives and course outcomes of ELEC360 Signals and systems
- Update and modify the course objectives and course outcomes of ECOM360 fundamentals of communication systems
- Update and modify the course objectives and course outcomes of ECOM422 digital communication systems
- Define the course objectives and course outcomes of ECOM 451 digital signal processing
- Define the course objectives and course outcomes of ECOM461 digital signal processing laboratory
- Define the course objectives and course outcomes of ELEC604 advanced signal processing

d. COURSE DEVELOPMENT

- ELEC 604: Advanced Digital Signal Processing, prepared the course material, power point slides, course assessment, course assignment, etc.
- ECOM451: digital signal processing: developed the material, slides, assignments, and course projects
- ECOM461: digital signal processing laboratory, designed the experiments and wrote the lab manual.
- ECOM422, digital communication systems, edited and modified most of the course material.
- ECOM561: information theory and coding, developed the course material.
- ECOM360 fundamentals of communication systems edited and modified most of the course material.

e. ADVISING

- Academic advisor for the EE male students AY2007-.
- Graduation project advisor for more than 15 students and 5 GPs.
- Laboratory coordinator and instructor for the digital signal processing laboratory, and communication systems laboratory.

- Organized a one day workshop on cRio LabVIEW Real time FPGA, and applications, January 16, 2011, UAE University, Al Ain, UAE.
- Internship Coordinator and advisor for more than 20 students.

HONORS

- Visiting Professor for six weeks at the Electrical Engineering department (ESAT) of the Katholieke Universiteit Leuven, from June 15 to August, 1, 2008.
- K.U. Leuven Bursary for Advanced Foreign Scholars 2003-2005
- Palestinian European Academic Cooperation in Education (PEACE) Grant, 2001-2004.
- DAAD Scholarship for Graduate Studies 1997-1999, University of Jordan, Amman, Jordan.
- Outstanding Student Award, Birzeit University, June 1995. Academic based award given to the top three students university wide.
- Honor Roll, Birzeit University, September 1991-July 1996.

SERVICES

a. PROFESSIONAL MEMBERSHIPS

- Jordan Engineers Association, Jordan.
- Institute of Electrical and Electronic Engineering (IEEE), USA.
- IEEE signal processing society member.
- Member of the European Association for Signal Processing (EURASIP), 2009.
- Member of the advisory board of Eummena organization: <http://www.eummena.org/>

b. DEPARTMENTAL

- Chair of the communication and signal processing focus group AY10/11-present.
- Member of the department research committee AY06/07, 10/11-11/12.
- Member of the screening committee to review applications for announced departmental positions.
- Member in the college examinations committee AY09/10-10/11.
- Department text books representative AY08/09-09/10.
- Member of the ABET assessment task force.
- Member of the EE department curriculum committee.
- Academic advisor of the year 2007 male EE students.

c. COLLEGE

- Member of the college Receiving and Technical Inspection committee AY08/09-09/10.

- Member of the college travel committee AY11/12-AY12/13.
- GP coordinator
- Member of the GP examination committees
- Member of the Internship examination committee.
- College Member

d. UNIVERSITY

- University committee for receiving and inspection of Maqam-2, Phase-2 project.
- Poster session co-chair for the International conference on Innovations in Information Technology (IIT 2009), Al Ain, UAE.
- Session chair in the IIT 2009 conference, Session D3-S1 (NET: Communication Networks) 9:30-11:30.
- Member of the organizing committee of the UAE University IT Marathon 2010. IT marathon 2010 is the 3rd national information technology for school students.
- TPC member of the 9th International Conference on Innovations in Information Technology (IIT'13) will be held in Al Ain, Abu Dhabi, United Arab Emirates, March 17 - 19

REVIEWING ACTIVITIES

a. REFEREE FOR THE FOLLOWING JOURNALS:

- IEEE transactions on Signal processing
- IEEE Signal Processing letters
- IEEE Transactions on wireless communications
- International Journal of Communication Systems
- EURASIP Journal on Wireless Communications and Networking
- IEEE Communications Letters

b. REFEREE FOR THE FOLLOWING INTERNATIONAL CONFERENCES:

- Vehicular Technology Conference, IEEE 2004
- International conference on communications, IEEE 2004.
- Global communications conference, IEEE, 2004
- Wireless communications and networking conference, IEEE, 2005
- International conference on communications, IEEE, 2005
- European signal processing conference, 2006
- International Conference on Ultra-Wideband, IEEE, 2006
- Global Communication conference, IEEE, 2006.
- Global Communication conference, IEEE, 2007.
- International conference on communications, IEEE 2008.

- International Symposium on Personal, Indoor and Mobile Radio Communications, IEEE, 2008
- Global Communications conference, IEEE, 2008
- International conference on communications, 2009
- Globecom 2012 - Wireless Communications Symposium
- IEEE International Symposium on Wireless Communication Systems 2012
- EUSIPCO 2012
- Fifth International Conference on Signal Processing and Communication Systems ICSPCS'2012

LANGUAGE KNOWLEDGE

- Arabic **Native**
- English **Excellent**
- Dutch **Fair**