

# JABER A. ABU QAHOUC

P.O.Box 677494  
ORLANDO, FL 32867

Tel: (407) 482-0873 (H)  
(407) 823-5180 (W)  
Email: jaberq@ieee.org

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## EDUCATION

- **Ph.D.**, School of Electrical Engineering and Computer Science, University of Central Florida-USA. May 2000 - December 2003. Graduated with GPA 4.0/4.0

Dissertation Title:

*High-Density High-Current Fast-Transient Low-Voltage DC-DC Converters*

- **M.S.**, Electrical Engineering, School of Electrical Engineering and Computer Science, University of Central Florida-USA, January 1999 - May 2000. Graduated with GPA 4.0/4.0

Thesis Title:

*Generalized Analysis of Soft-Switching DC-DC Converters*

- **B.Sc.**, Electronics Engineering, Princess Sumaya University (PSUT)/Royal Scientific Society (RSS), Amman-Jordan, September 1993- July 1998. Graduated with First Rank and was awarded King Hussain Ben Talal of Jordan Royal Watch.

## EXPERIENCE

Jan 04 – Present

**University of Central Florida – School of Electrical Engineering and Computer Science, Orlando, FL-USA**

- Visiting Assistant Professor. Performing research activities and teaching undergraduate/graduate courses.

Jan 02–Dec 03

**University of Central Florida – School of Electrical Engineering and Computer Science, Orlando, FL-USA**

- Adjunct Faculty (Lecturer). Teaching engineering core courses, prepared complete lecture notes on the web, and taught online sessions.

Jan 99 – Dec 03

**University of Central Florida – School of Electrical Engineering and Computer Science, Orlando, FL-USA**

- Research Assistant
- Working on several funded research projects on:

- High-Density DC-DC Converters and Low-Voltage High-Current Fast-Transient Voltage Regulator Modules (VRMs).
- Power factor correction, soft-switching converters, low-voltage dc power supplies, distributed power system, and low voltage applications.
- All of these projects are funded by Florida Space Consortium, NASA, NSF, ASTEC Power, Intel and University of Central Florida. The research projects aim at developing advanced technologies for improving conversion efficiency, dynamic performance, power density, power quality, and enhancing economic operation of power system.

**Jan 99 – Aug 02      Advanced Power Electronics Corporation (APECOR), Orlando, FL-USA**

- Research & Development Engineer. Worked on developing Soft-switching DC-DC and AC-DC Power Factor Correction (PFC) Converters, Low-Voltage High-Current DC-DC Voltage Regulator Modules, Closed Loop Controllers, and on writing company proposals and reports.

**Sep 98 – Jan 99      Royal Scientific Society (RSS) - Electronic Services and Training Center (ESTC), Amman-Jordan**

- The main job responsibility was to test electrical and electronic equipment of private industries according to IEC international standards and local standards for quality control purposes.
- Creating test procedures and developing technical reports.

**Oct 97 – Jun 98      Princess Sumaya University, Amman-Jordan**

- Designed a fiber optic tranceiver system and implemented fiber optics link.
- Developed toolbox that worked under MatLAB® Simulink for fiber optic system.

**Jul 96 – Sep 96      Czech Technical University-CVUT, Praha-Czech Republic**

- Modeling of a DC motor control system using Pascal. The program is used to check the system response according to variable changes in the system parameters before applying the changes to the physical system. The program is also used for educational purposes.

**COMPUTER KNOWLEDGE**

**Software:**

- MATLAB
- MathCAD
- Pspice/Orcad

- Layout Plus/Orcad
- Electronics Work Bench
- IsoPro and QuickCAM for PCB Layout
- Visio Technical for drawing
- Microsoft Office
- Paint Shop Pro and many others.

**Programming Languages and Operating Systems:**

- Assembly
- Fortran
- Pascal
- C language
- WIN 95/98/2000/XP

**HONORS AND AWARDS**

- Two ASTEC Power/Emerson Network Power Certificates of Achievements, 2003/2004.
- IEEE Outstanding Graduate Student Award, April 12, 2002.
- Who's Who 2002 and Who's Who 2003 – 100 of the Best and Brightest, Golden Knights in Central Florida Publication, Spring 2002 and Spring 2003 Editions.
- Frank Hubbard Engineering Graduate Scholarship, 2000-2001 and 2001-2002.
- Graduate travel fellowship, Spring 2000.
- King Hussain Ben Talal of Jordan Royal Watch Award by Princess Sumaya Bent El-Hassan, July 1998, Amman-Jordan.
- First Rank in undergraduate class of 1998.
- Awarded for the best senior project, 1997/1998.
- Princess Sumaya Award for Honor Distinction, 1997.
- Certificate of Achievement from the Faculty Center for Teaching and Learning-University of Central Florida.
- Tau Beta Pi Engineering Honor Society Certificate in Engineering Future Program.
- Master Degree with GPA of 4.0/4.0.
- Ph.D. GPA of 4.0/4.0.

**MEMBERSHIPS**

- The Institute of Electrical and Electronics Engineering (IEEE) membership.
- IEEE Power Electronics Society (PELS) membership.
- IEEE Circuits and Systems Society (CAS) membership.
- IEEE Electron Devices Society membership.
- Eta Kappa Nu Honor Society.
- Phi Kappa Phi Honor Society.
- Jordan Engineers Association membership.
- Member of the Florida Power Electronics Center (Florida PEC Group) at the University of Central Florida (UCF).

**PROFESSIONAL ACTIVITIES**

- Reviewer, IEEE Transactions on Power Electronics.
- Reviewer, IEEE Transactions on Aerospace and Electronic Systems.
- Reviewer, IEEE Industry Applications Society.

## RECENT PUBLICATIONS

### Journals:

- [1] **Jaber Abu-Qahouq** and Issa Batarseh, "Unified Steady-State Analysis of Soft-Switching DC-DC Converters," IEEE Transactions on Power Electronics, Vol.17, No.5, pages: 684-691, September 2002.
- [2] Mahmoud Hassan, **Jaber Abu-Qahouq**, M. AL-Shair, and I. Nabhan, "PC Based Optical Fiber Link Design and Simulation," Journal of Institute of Maths and Computer Sciences, Vol. 10, No.2, Page(s): 191 – 200, 1999.
- [3] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Multiphase Voltage-Mode Hysteretic Controlled Dc-Dc Converter with Novel Current Sharing," Accepted for publication in the IEEE Transactions on Power Electronics. Expected Publication Date is November 2004.
- [4] Hong Mao, **Jaber Abu-Qahouq**, Shiguo Luo, and Issa Batarseh, "Zero-Voltage-Switching Half-Bridge DC-DC Converter with Modified PWM Control Method," Accepted for publication in the IEEE Transactions on Power Electronics. Scheduled to appear on July 2004 issue.
- [5] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Non-Isolated Multiphase Half-Bridge-Buck Topology with Inherent Current Sharing Capability and Soft-Switching and Coupled-Inductors Current-Doubler," Accepted for publication in the Journal of Circuits, Systems, and Computers/ Power Electronics Special Issue.
- [6] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Interleaved Current Doublers with Parallel Connected Transformers," Submitted for review to the IEEE Transactions on Circuits and Systems.
- [7] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Alternated Duty Cycle Control Method for Half-Bridge DC-DC Converter," Submitted for review to the IEEE Transactions on Circuits and Systems.
- [8] **Jaber Abu-Qahouq**, Issa Batarseh, Natorn Pongratananukul, and Takis Kasparis, "Multiphase Hysteretic-Controlled VRM with Current Sharing Equalization Using a DSP Controller," Submitted for Review to the Journal of Circuits, Systems, and Computers.
- [9] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Maximum Efficiency Point Tracking (MEPT) Method and Dead Time Control," In progress and to be Submitted for Review to the IEEE Transactions on Power Electronics.
- [10] Khalid Rustom, **Jaber Abu-Qahouq**, and Issa Batarseh, "Soft-Switching Single-Stage Power Factor Correction Converter," In Progress.

### Conferences:

- [1] **Jaber Abu-Qahouq**, H. Wei, W. Gu, and Issa Batarseh, "Analysis and Design of Soft-Switching Power Factor Correction Converter," Proceedings of the 2000 IEEE International Symposium on IEEE Circuits and Systems, ISCAS'00. Vol. 3, Page(s): 235 –238, 2000.

- [2] Wei Gu, **Jaber Abu-Qahouq**, Shiguo Luo and Issa Batarseh, "A ZVT-PWM Single Stage PFC Converter with an Active Snubber", IEEE Midwest Symposium on Circuits and Systems, MWSCAS'01, Vol. 2, pages: 972-975, August 2001.
- [3] **Jaber Abu-Qahouq**, H. Wei, W. Gu and I. Batarseh, "Steady-State Analysis and Design of Soft-Switching Converters with Near Unity Power Factor," International Power Electronics Conference, Tokyo, Japan, April 2000.
- [4] **Jaber Abu-Qahouq** and Issa Batarseh, "Generalized Analysis of Soft-Switching DC-DC Converters," 31st Annual IEEE Power Electronics Specialists Conference, PESC '00, Vol. 1, Page(s): 185 –192, 2000.
- [5] **Jaber Abu-Qahouq** and Issa Batarseh, "Generalized Analysis of Soft-Switching DC-DC Converters," Proceedings of the 2000 IEEE International Symposium on IEEE Circuits and Systems, ISCAS'00. Vol. 3, Page(s): 507 –510, 2000.
- [6] K. Rustom, **Jaber Abu-Qahouq**, and Issa Batarseh, "Steady-State Analysis of Zero-Voltage-Transition-PWM Converter with Power Factor Correction," 4th Jordanian International Electrical & Electronics Engineering Conference, Proceedings of the 4th JIEEEEC, pages: 121-125, April 2001.
- [7] **Jaber A. Abu-Qahouq** and Issa Batarseh, " Review of On-Board Low Voltage/High Current DC-DC Converters for the New Generation of Microprocessors". 4th Jordanian International Electrical & Electronics Engineering Conference, Proceedings of the 4th JIEEEEC, pages: 127-135, April 2001.
- [8] **Jaber A. Abu-Qahouq**, Jia Lou and Issa Batarseh, " Voltage Regulator Module with Interleaved Synchronous Buck Converters and Novel Voltage-Mode Hysteretic Control. " IEEE Midwest Symposium on Circuits and Systems, MWSCAS'2001, vol. 2, pages: 972-975, August 2001.
- [9] **Jaber A. Abu-Qahouq**, Nattorn Pongratananukul, Issa Batarseh, and Takis Kasparis, " Novel Transient Cancellation Control Method for Future Generation of Microprocessors," Applied Power Electronics Conference and Exposition Proceedings, APEC 2002, vol. 1, pages: 216 -222, 2002.
- [10] **Jaber A. Abu-Qahouq**, Nattorn Pongratananukul, Issa Batarseh, and Takis Kasparis, " Multiphase Voltage-Mode Hysteretic Controlled VRM with DSP Control and Current Sharing Solution," Applied Power Electronics Conference and Exposition Proceedings, APEC 2002, vol. 2, pages: 663 –669, 2002.
- [11] **Jaber A. Abu-Qahouq**, Hong Mao, and Issa Batarseh, Novel Control Method for Multiphase Low-Voltage High-Current Fast-Transient VRMs. 33rd IEEE Power Electronics Specialists Conference (PESC'2002), Vol. 4, pages: 1576 –1581, June 23-27, 2002.
- [12] Hong Mao, **Jaber Abu-Qahouq**, Songquan Deng, and Issa Batarseh, "A New Duty-Cycle-Shifted PWM Control Scheme for Half-Bridge DC-DC Converters to Achieve Zero-Voltage-Switching,"

Eighteenth Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2003, vol. 2, pages: 629-634, February 2003.

[13] Hong Mao, **Jaber Abu-Qahouq**, Shiguo Luo, and Issa Batarseh, "New Zero-Voltage-Switching Half-Bridge DC-DC Converter and PWM Control Method," Eighteenth Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2003, vol. 2, pages: 635-640, February 2003.

[14] Jia Luo, Nattorn Pongratananukul, **Jaber A. Abu Qahouq**, and Issa Batarseh, "Time-varying Current Observer with Parameter Estimation for Multiphase Low-Voltage High Current Voltage Regulator Modules," Eighteenth Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2003, vol. 1, pages: 444-450, February 2003.

[15] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "New Coupled-Inductors Current-Doubler Topology," 34<sup>th</sup> IEEE Power Electronics Specialists Conference and published in the conference proceedings, Vol. 2, Pages: 648 -655 June 15-19, 2003.

[16] Hong Mao, **Jaber Abu-Qahouq**, Weihong Qiu, Yangyang Wen, and Issa Batarseh, "Lossless Snubber Circuits for Current Doubler Rectifiers to Reduce Reverse-Recovery Losses," The 29<sup>th</sup> Annual Conference of the IEEE Industrial Electronics Society, Roanoke, Virginia, USA, pages: 2639-2645, November 2003.

[17] Hong Mao, Songquan Deng, **Jaber Abu-Qahouq**, Yangyang Wen, and Issa Batarseh, "An Active-Clamp Snubber for Isolated Half-Bridge DC-DC Converters," The 29<sup>th</sup> Annual Conference of the IEEE Industrial Electronics Society, Roanoke, Virginia, USA, pages: 42-48, November 2003.

[18] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Interleaved Current Doublers with Parallel Connected Transformers' Primary and Secondary Sides," Accepted for publication and presentation at the Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2004, February 2004.

[19] Hong Mao, Songquan Deng, **Jaber Abu-Qahouq**, and Issa Batarseh, "A Modified DCS Controlled Half-bridge ZVS DC-DC Converter with Grounded Auxiliary Switch" Accepted for publication and presentation at the Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2004, February 2004.

[20] Hong Mao, **Jaber Abu-Qahouq**, Shiguo Luo, and Issa Batarseh, "Zero-Voltage-Switching (ZVS) Two-Stage Approaches with Output Current Sharing for 48V Input DC-DC Converter," Accepted for publication and presentation at the Annual IEEE Applied Power Electronics Conference and Exposition, APEC'2004, February 2004.

[21] **Jaber Abu-Qahouq**, Hong Mao, and Issa Batarseh, "Alternated Duty Cycle Control Method for Half-Bridge DC-DC Converter," Accepted for publication and presentation at the Annual IEEE Power Electronics Specialists Conference and Exposition, PESC'2004, June 2004.

[22] **Jaber Abu-Qahouq**, Hong Mao, Hussam Al-Atrash, and Issa Batarseh, "Maximum Efficiency Point Tracking (MEPT) Method and Dead Time Control," Accepted for publication and presentation at the Annual IEEE Power Electronics Specialists Conference and Exposition, PESC'2004, June 2004.

[23] Songquan Deng, Hong Mao, **Jaber Abu-Qahouq**, and Issa Batarseh, "A New Peak Current Control Scheme for Half-Bridge DC-DC converters," Accepted for publication and presentation at the Annual IEEE Power Electronics Specialists Conference and Exposition, PESC'2004, June 2004.

**Others:**

[1] **Jaber Abu-Qahouq**, "Generalized Analysis of Soft-Switching DC-DC Converters," Master Thesis, University of Central Florida, 2000.

[2] **Jaber Abu-Qahouq** and Mohammad AL-Shair, " Digital Fiber Optics System: Design, Simulation, and Implementation," Undergraduate Thesis, Princess Sumaya University, Amman-Jordan, 1998.

[3] **Jaber Abu-Qahouq** and Others, " Sensors and Transducers-Term Projects, " Chapter author, Princess Sumaya University for Technology (PSUT)/Royal Scientific Society (RSS) – Amman-Jordan, 1997.

**PATENTS**

[1] "Control Method and Circuit to Provide Voltage and Current Regulation For Multiphase DD-DC Converters," US Patent, Inventors: Issa Batarseh, Wei Gu, **Jaber Abu Qahouq**, Wenkai Wu, and Hong Mao. US Patent Number: US 6,628,106.

[2] "Half-Bridge Zero-Voltage-Switching (ZVS) Pulse Width Modulation (PWM) DC-DC Converter," US Patent Pending, Inventors: Issa Batarseh, Hong Mao, and **Jaber Abu Qahouq**, filed Oct. 17, 2002, Serial No. 10/272719.

[3] " Zero-Voltage-Switching (ZVS) Half-Bridge DC-DC Converter Topology by Utilizing the Transformer Leakage Inductance Trapped Energy," US Patent Pending, Inventors: Issa Batarseh, Hong Mao, and **Jaber Abu Qahouq**. Filed Jan. 30, 2004, Serial No. 10/769,705.

[4] " DC-DC Converter with Coupled-Inductors Current-Doubler," US Patent Pending, Inventors: Issa Batarseh, **Jaber Abu Qahouq**, and Hong Mao. Filed April 26, 2004, Serial No. 10/832,103.

[5] " DC-DC Converter with Interleaved Current Doubler Rectification Topology," US Patent Pending, Inventors: Issa Batarseh, **Jaber Abu Qahouq**, and Hong Mao. Patent Pending.

[6] " Maximum Efficiency Point Tracking (MEPT) Method and Dead Time Control," US Patent Pending, Inventors: Issa Batarseh, **Jaber Abu Qahouq**, Hong Mao. Disclosure filed.

[7] " Alternated Duty Cycle Control Method for Half-Bridge DC-DC Converters," US Patent Pending, Inventors: Issa Batarseh, **Jaber Abu Qahouq**, Hong Mao. Disclosure filed.

**LABORATORY SKILLS**

- Troubleshoot and maintain electronic instruments and hardware
- Abilities to use oscilloscopes, logic analyzers and different measurement lab tools.
- Design and create PCB layouts and produce them using PCB machines.
- Produce technical reports, manuals and presentations.
- Abilities in using computer and many softwares.

**PERSONAL**

Enjoy reading, travelling, watching movies, listening to music, and Sports.

**REFERENCES**

- Professor Issa Batarseh, School of Electrical Engineering and Computer Science, University of Central Florida, e-mail: batarseh@mail.ucf.edu, Tel: (407) 823-0185.
- Dr. Chris Iannello, PH-J/ Ground Systems Division, Kennedy Space Center, Florida, e-mail: chris\_iannello@adelphia.net, Tel: (321) 861-3276.
- Professor Wasfy Mikhael, School of Electrical Engineering and Computer Science, University of Central Florida, e-mail: mikhael@mail.ucf.edu, Tel: (407) 823-3210.
- Dr. Takis Kasparis, Associate Professor, School of Electrical Engineering and Computer Science, University of Central Florida, e-mail: kasparis@pegasus.cc.ucf.edu, Tel: (407) 823-5913.
- Dr. Thomas Wu, Assistant Professor, School of Electrical Engineering and Computer Science, University of Central Florida, e-mail: tomwu@mail.ucf.edu, Tel: (407) 823-5957.
- Additional references are available upon request.