

Curriculum Vitae of Fadel Lashhab

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Professional Summary

Ph.D. Electrical Controls Engineer professionally with 15 + years in teaching, research, and industrial experience seeking a full-time position as a control engineer to utilize my skills in electrical, instrumentation and controls engineering, including process control, digital signal processing and related areas such as cooperative control in multi-agent systems as applied to building efficiency control and smart grid.

Education

Colorado School of Mines, Golden, Colorado, USA

Ph.D. Electrical Engineering (GPA 3.842 of 4.00) **12/2012**

M.Sc. Electrical Engineering (GPA 3.842 of 4.00) **12/2011**

In Electrical Engineering, with focus on modeling, spectral properties, consensus, and control of large-scale interconnected complex systems such as buildings. Application: Energy Management System.

Budapest University of Technology and Economics, Budapest, Hungary

Pre-Master (Pre-M.Sc.) Electrical Engineering (GPA 4.84 of 5.00) **08/2002**

M.Sc. Electrical Engineering (GPA 5.00 of 5.00 with Honors) **06/2004**

Post-Master (Post-M.Sc.) Biomedical Engineering (GPA 4.80 of 5.00) **06/2005**

In Electrical Engineering, with focus on computer and control engineering. Application: DeltaV Control System.

Al-Jabal Al-Gharbi University, Jado, Libya

B.Sc. Electrical Engineering (GPA 73.51%) **05/1997**

In Electrical Engineering, with focus on instrumentation and control engineering.

Industry Experience

Emerson Company/Budapest University, Budapest, Hungary **09/2002 – 08/2005**

- Used the DeltaV Control System, designing, implementing/configuring different PID controllers, controlling the pressure and temperature of a real boiling system.
- Defined control system designs and documentation.
- Implemented, designed and troubleshooted system hardware, software, network and instrument bus technologies for the boiling system.

Dong Ah Company (Al Nahr Ltd. ANC), Al Brega, Libya **08/1997 – 12/2000**

Assistant Manager of the Utility and Maintenance Department

- Supervised and trained technicians with operation, testing, troubleshooting, and maintenance of control components (sensors, electromagnetic valves, motor control devices, etc.) in the utility department (water treatment, oxygen, acetylene, ice and boiler plants).

- Managed necessary testing of electrical components and interpreted test reports. Prepared cost effective operation and technical proposals. Kept up-to-date, developed and modified control system documents including drawings/diagrams, panel, etc. Specified and purchased control system hardware and electrical devices.
- Troubleshoot and modify PLC programs and other electrical and control devices.

Relevant Research Skills and Experience

Research & Training, Washington Dc Metro Area 06/2015– Present

- Involved with RT- LAB solutions for real time applications training, presented by OPAL-RT Technologies company for University of District of Columbia.
- Involved with Building Energy Management Open Source Software (BEMOSS) project activities, Virginia Tech Advanced Research Institute.
- Published IEEE peer-reviewed journal articles and manuscripts under review/preparation.
- Author of robust H_{∞} controller design for dynamic consensus networks.

Al-Jabal Al-Gharbi University, Gharian, Libya 02/2013 – 05/2015 ***Lecturer at Department of Electrical Engineering***

- Assisted in curriculum development for electrical engineering courses.
- Researched robust H_{∞} controller design for dynamic consensus networks.
- Served as academic advisor to assist with class scheduling and degree plans.
- **Courses Taught:** AC and DC Circuits Analysis; Continuous and Discrete System Theory; Signals and Systems; C++ Programming; Digital Signal Processing; Matlab/Simulink.

Colorado School of Mines, Golden, Colorado 08/2008 – 12/2012 ***Graduate Research Assistant (Ph.D. Program)***

- Researched decision and control for interconnected systems on the “Cyber-Enabled Efficient Energy Management of Structures” project (National Science Foundation, Grant CSN-0931748).
- Co-author of these papers: Dynamic consensus networks as applied to the analysis of building thermal processes; Consensus of positive real systems cascaded with a single integrator; Iteration-domain closed-loop frequency response shaping for discrete-repetitive processes.
- Participated in internal/external control group meetings, seminars and conferences.

Al-Jabal Al-Gharbi University, Gharian, Libya 07/2005 – 02/2008 ***Instructor at Department of Electrical Engineering***

- Planned, prepared and presented classes and relevant assignments. Maintained clear documentation and feedback on student progress. Motivated and inspired confidence in students and colleagues to overcome limitations to personal growth and success.
- **Supervisor,** Modeling, analysis, and control of boiling system, January 2006 - December 2007, Hana M. and Gazala R., Libya.
- **Courses Taught:** Control Systems; Theory and Design of Advanced Control Systems; Robotic Systems. Probability, Stochastic Processes, and Kalman Filtering.

Budapest University of Technology and Economics, Budapest, Hungary 12/2001 – 06/2005 ***Teaching and Laboratory Assistant (M.Sc. Program)***

- Worked on the modeling, analysis and control of a continuous flow boiling system project.
- Researched in biomedical engineering, including acoustical signal processing, analysis and simulation of medical signals.

- Worked on an extensive program for applying the controls in biomedical engineering, including lab experiment research dealing with physiological systems modeling and control, simulation and estimation, analysis, of acoustical signals, medical signals and images, with higher programming languages.

Al-Jabal Al-Gharbi University, Jado, Libya

01/2000 – 11/2001

Research/Teaching Assistant

- Delivered laboratory lectures and prepared undergrad students for the electrical engineering technology program. Helped with the development of proposals, reports, and publishing research.

Technical Skills and Professional Competencies

Software:

DeltaV System, SCADA, Volttron, PLC, MATLAB/Simulink, Mathematica, C, C++ Programming, LaTeX, MS Office (Word, Excel, PowerPoint, Outlook, Access, Visio), Visual Studio, EnergyPlus Energy Simulation Software.

Communication:

Public speaking, technical writing, analytical reporting.

Professional Competencies:

Creative Problem solver, organized, detail oriented, good listener, goal-getter, decision maker, conflict resolver. Experienced in writing of proposals, working in collaboration with industrial partners, and effective in working independently and collaboratively in teams.

Awards, Honors & Professional Memberships

- Received M.Sc. and Ph.D. Scholarships awards from Ministry of Higher Education and Scientific Research, Libya to complete my studies in USA.
- 2012 Graduate Achievement Award in Electrical Engineering (The Colorado School of Mines).
- “Student of the Year - Budapest University” in 2002, 2003, 2004. Earned Master’s degree with honors GPA 5.00.
- Received “Outstanding Undergraduate Teacher - Al-Jabal Al-Gharbi University” award in 2013.
- IEEE Membership
- IEEE Control Systems/ Power & Energy/Internet of Things Societies Memberships.
- Reviewer for several IEEE journals and conference proceedings.
- Academic Staff and Leadership in Al-Jabal Al-Gharbi University, Gharian, Libya.

Conferences, Webinar/Seminar and Workshop Attended

- The Dynamic consensus networks with application to the analysis of building thermal processes, Electrical Engineering and Computer Science (EECS) Poster Fair; Colorado School of Mines; Dec. 2011.
- Dynamic Consensus Networks: Spectral Properties, Consensus, and Control, Center of Automation, Robotics and Distributed Intelligence (CARDI) Research Fair; June 2012.
- Application of Microgrids and Distributed Generation; IEEE Web seminar presented by John McDonald; May 12, 2016.

- Making Buildings and City Infrastructures Smart, The joint Northern Virginia/Washington PES Chapter IEEE, presented by Professor Saifur Rahman; IEEE Fellow and PES Distinguished Lecturer; April 27, 2016.
- Internet of Things IoT is the Body, Artificial Intelligent is the Brain, IEE IoT webinar, presented by Jay Iorio, Innovation Director, IEEE Standards Association, BC Biermann, Educational Technologist, Academic, Digital Artist, Heather Schlegel, Futurist; May 18, 2016.
- All-Star LEEPers: Success Stories from the Parking Lot, Better Buildings, a Lighting Energy Efficiency in Parking (LEEP) Campaign Organization webinar; May 24, 2016.
- Renewable Generation Studies, Lessons Learned; IEEE Smart Grid complementary webinar; Presenters: Nelson Bacalao, Hugo Bashualdo, and George Zhou - Siemens PTI.; May 26, 2016.
- Built an Internet of Things Weather Station, IEEE Northern Virginia Section, Technical Workshop Series Presents: Instructor: Karl Berger, a chair of the Northern VA/Washington joint section Vehicular Technology Society chapter and an amateur radio operator; June 4, 2016.
- The “Soft” Internet of Things, IEEE Internet of things Webinar, presented by Roberto Saracco, IEEE Future Directions Committee & EIT Digital Trento Node Director; September 29, 2016.
- Complimentary Webinar: Smart Grids in Latin America: Current State of Development and Future Perspectives; Presenters: Rafael de Sá Ferreira & Luiz Augusto Barroso- PSR; Thursday, November 3, 2016.
- The SDN in LANs: Programming the Network to Secure IoT Traffic; IEEE Webinar; Presented by Matthieu Boussard, Nicolas Le Sauze; November 09, 2016.
- Integrating the IoT and Cultural Heritage in the Smart City; IEEE Webinar; Presenter: Roberto Minerva, Chair, IEEE IoT Initiative; October 27, 2016.

Research Interest

- My research interests include the theory of cooperative control in multi-agent systems as applied to building efficiency control:
 - 1- Development of methods for the control of energy flow in buildings, as enabled by cyber infrastructure. A significant novelty of this project lies in a fundamental view of a building as a set of overlapping, interacting networks. These networks include the thermal network of the physical building, the energy distribution network, the sensing and control network, as well as the human network. This work thus seeks to develop methods for simulating, optimizing, modeling, and control of complex, heterogeneous networks, with specific application to energy efficient buildings. Developments in the areas of cyber physical and microgrid systems present an enormous opportunity to substantially increase energy efficiency and reduce energy-related emissions in the commercial building energy sector.
 - 2- Allow sensing and control (using IOT devices) of HVAC, lighting and plug load controllers in commercial buildings to improve energy efficiency, reduce energy consumption, and foster demand response (DR) implementation. Furthermore, integration of machine learning and data analytics techniques to allow agents to implement self-learning algorithms to enable user comfort and save energy.

Publications

Thesis and Dissertation

1. **Lashhab F.** "Control of Continuous Flow Boiling System using DeltaV control system." M.Sc. Thesis, Budapest University of Technology and Economics, 2005.
2. **Lashhab F.** "Dynamic Consensus Networks: Spectral Properties, Consensus, and Control." Diss. Colorado School of Mines, 2012.

Peer-Reviewed Journal Articles

3. Oh, Kwang-Kyo, **F. Lashhab**, K. L. Moore, T. L. Vincent, and H. S. Ahn. "Consensus of positive real systems cascaded with a single integrator." *International Journal of Robust and Nonlinear Control* 25.3 (2015): 418-429.
4. **Lashhab, Fadel**, Kevin Moore, Tyrone Vincent, Deyuan Meng, and Khalid Kuwairi. "Robust H_∞ Controller Design for Dynamic Consensus Networks." *International Journal of Control* just-accepted (2017): 1-20.

Peer-Reviewed Conference Papers

5. Moore, K.L., T. L. Vincent, **F. Lashhab**, and Liu, C. "Dynamic consensus networks with application to the analysis of building thermal processes." *Proceedings of the IFAC World Congress*. Vol. 18. No. 1. 2011.
6. Moore, K. L., and **F. Lashhab**. "Iteration-domain closed-loop frequency response shaping for discrete-repetitive processes." *Proceedings of the 2010 American Control Conference (ACC)*. IEEE, 2010.

Manuscripts Under Review/Preparation

7. **Lashhab F.**, and K.L. Moore. "Disturbance Attenuation in Dynamic Consensus Networks: an H_∞ Approach". Submitted to *Proceedings of the IFAC World Congress*.
8. **Lashhab F.**, and K.L. Moore. " H_2 Controller Design for Dynamic Consensus Networks." To be Submitted to the 29th Chinese Control and Decision Conference (2017 CCDC).
9. **F. Lashhab**, K. L. Moore, T. L. Vincent, and Oh, Kwang-Kyo. "Spectral Properties and Consensus of Dynamic Networks". Submitted to 2017 Automatica - Journal - Elsevier.