

# Mithat John Kisacikoglu

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## Education

- 2007–2013 Ph.D., Electrical Engineering, University of Tennessee  
Dissertation Title: Vehicle-to-grid reactive power operation analysis of the EV/PHEV bidirectional battery charger  
Supervisors: Leon Tolbert and Burak Ozpineci
- 2005–2007 M.Sc., Electrical Engineering, University of South Alabama  
Thesis Title: Fuzzy logic control of a fuel cell/ultracapacitor hybrid vehicular power system  
Supervisors: Mohammad S. Alam and Mehmet Uzunoglu
- 2000–2005 B.Sc., Electrical Engineering, Istanbul Technical University  
Design Project Title: A PEM fuel cell power conditioner design project for stand alone residential operation  
Supervisor: Deniz Yildirim (Ph.D. from University of Colorado Boulder)

## Professional Experience

- 2016–present Assistant Professor, Electrical and Computer Engineering, The University of Alabama, Tuscaloosa, AL.
- 2015–2016 Research Engineer, Center for Integrated Mobility Sciences, National Renewable Energy Laboratory, Golden, CO.
- 2014–2015 Assistant Professor, Electrical and Electronics Engineering, Hacettepe University, Ankara, Turkey.
- 2007–2013 Research Assistant, Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks (CURENT), University of Tennessee, Knoxville, TN.
- 2008–2013 Researcher (part-time), Power Electronics and Electric Machinery Group, Oak Ridge National Laboratory, Oak Ridge, TN.
- 2005–2007 Research Assistant, University of South Alabama, Mobile, AL.

## Professional Recognition and Honors

- IEEE PES General Meeting Prize Paper Award, 2019
- Journal of Modern Power Systems and Clean Energy (MPCE) Best Paper Award, 2018
- Outstanding Dedication Award as Associate Editor by Transportation Systems Committee, IEEE Industry Applications Society, 2017

- Received TUBITAK Career Award, Turkey, 2016
- Postdoctoral Return Fellowship Award, TUBITAK, Turkey, 2013.
- Siemens Future Professionals Fellowship, 2001 – 2005.

## Research Grants and Contracts

### Funded and In Progress:

- Aug. 2020 - ongoing, "Drone Power Electronics Security," UA Cyber Institute, \$29,899 **PI: M. Kisacikoglu** (shared credit: 70%).
- Mar. 2018 – ongoing, "CRII: CPS: Internet-Inspired Autonomous Electric Vehicle (EV) Charging" National Science Foundation, \$175,000 **PI: M. Kisacikoglu** (shared credit: 100%).

### Funded and Completed:

- Jul. 2019 - Aug. 2020, "Power America: Removing Customer Concerns to Support Industry Adoption of MV SiC Power Module," DOE Power America BP5, \$398,824 **Co-PI: M. Kisacikoglu** (shared credit: 30%)
- Feb. 2019 - Nov. 2019, "Evaluation of Energy Management Solutions for Outdoor Moultrie Mobile Camera Series," EBSCO Industries, \$30,249 **PI: M. Kisacikoglu** (shared credit: 100%).
- Jul. 2017 – Sep. 2018, "Development of a DC Fast Charging Station Model for use with EV Infrastructure Projection Tool" National Renewable Energy Laboratory, \$35,201 **PI: M. Kisacikoglu** (shared credit: 100%).
- Feb. 2015 – Jun 2016, "Impact Analysis of Distribution Grid Embedded Systems (DAGSIS)," Energy Market Regulatory Agency (EMRA) of Turkey, \$1,000,000, **PI: EnerjiSA Baskent Electric Distribution Company, Consultant: M. Kisacikoglu**  
Involved at every stage of the project from proposal planning to project implementation as the only academic consultant. A new EV charging laboratory at Hacettepe University was also funded. This was the first wide-scale project on EV charging impact analysis in Turkey. News regarding the policy implications of this project available here (in Turkish): <http://www.hurriyet.com.tr/epdkdanyerli-otomobil-ile-ilgili-cok-onemli-aciklama-40638422>.
- Oct. 2013 – Oct. 2015, "Analysis of Vehicle-to-grid (V2G) Ancillary Services Provided by Plug-in Electric Vehicles," TUBITAK, \$32,000, **PI: M. Kisacikoglu** (shared credit: 100%).

## Publications

*Total number of citations (Google scholar): 1700+ , h-index: 16*

### Refereed Journal Articles

- [1] **M. C. Kisacikoglu**, M. Uzunoglu, M. S. Alam, "Load sharing using fuzzy logic control in a fuel cell/ultra-capacitor hybrid vehicle", Int. J. Hydrogen Energy, vol. 31, no. 3, pp. 1497–1507, Feb. 2009.
- [2] **M. C. Kisacikoglu**, B. Ozpineci, L. M. Tolbert, "EV/PHEV bidirectional charger assessment for V2G reactive power operation," IEEE Trans. Power Electr., vol. 28, no. 12, pp. 5717–5727, Dec. 2013.

- [3] M. Kesler, E. Ozdemir, **M. C. Kisacikoglu**, L. M. Tolbert, "Power converter-based three-phase non-linear load emulator for hardware test-bed system," *IEEE Trans. Power Electr.*, vol. 29, no. 11, pp. 5806–5812, Nov. 2014.
- [4] M. Kesler, **M. C. Kisacikoglu**, L. M. Tolbert, "Vehicle-to-grid reactive power operation using plug-in electric vehicle bidirectional off-board charger," *IEEE Trans. Indust. Electr.*, vol. 16, no. 12, pp. 6778–6784, Dec. 2014.
- [5] **M. C. Kisacikoglu**, M. Kesler, L. M. Tolbert, "Single-phase on-board bidirectional PEV charger for V2G reactive power operation," *IEEE Trans. Smart Grid*, vol. 6, no. 2, pp. 767–775, Mar. 2015.
- [6] B. Li, **M. C. Kisacikoglu**, C. Liu, N. Singh, M. Erol-Kantarci, "Big data analytics for electric vehicle integration in green smart cities," *IEEE Communications Mag.*, vol. 55, no. 11, pp. 19–25, Nov. 2017.
- [7] **M. C. Kisacikoglu**, F. Erden, N. Erdogan, "Distributed control of PEV charging based on energy demand forecast," *IEEE Trans. Indust. Informat.*, vol. 14, no. 1, pp. 332–341, Jan. 2018.
- [8] N. Erdogan, F. Erden, **M. C. Kisacikoglu**, "A fast and efficient coordinated vehicle-to-grid discharging control scheme for peak shaving in the power distribution system," *J. Mod. Power Syst. Clean Energy*, vol. 6, no. 3, pp. 555–566, 2018. [2018 MPCE best paper award.]
- [9] F. Erden, **M. C. Kisacikoglu**, N. Erdogan, "Adaptive V2G peak shaving and smart charging control for grid integration of plug-in electric vehicles," *Electric Power Components Syst.*, vol. 46, no. 13, pp. 1494–1508, 2018.
- [10] E. Y. Ucer, I. Koyuncu, **M. C. Kisacikoglu**, M. Yavuz, A. Meintz, C. Rames, "Modeling and analysis of a fast charging station and evaluation of service quality for electric vehicles," *IEEE Trans. Transport. Electrific.*, vol. 5, no. 1, pp. 215–225, Mar. 2019.
- [11] E. Bulut, **M. C. Kisacikoglu**, K. Akkaya, "Spatio-temporal non-intrusive V2V charge sharing coordination," *IEEE Trans. Veh. Technol.*, vol. 68, no. 10, pp. 9385–9398, Oct. 2019.
- [12] E. Y. Ucer, **M. Kisacikoglu**, M. Yuksel, A. C. Gurbuz, "An internet-inspired proportional fair EV charging control method," *IEEE Syst. J.*, vol. 13, no. 4, pp. 4292–4302, Dec. 2019.
- [13] E. Y. Ucer, **M. Kisacikoglu**, M. Yuksel, "Decentralized Additive Increase Multiplicative Decrease Based Electric Vehicle Charging," *IEEE Syst. J.*, accepted.
- [14] R. Buckreus, C. P. Smith, **M. Kisacikoglu**, "Development of a Hybrid Energy Management Solution for an Outdoor Trail Camera," *IEEE Trans. Ind. Electron.*, accepted.
- [15] E. Ucer, R. Buckreus, M. E. Haque, **M. Kisacikoglu**, Y. Sozer, S. Harasis, "Analysis, Design, and Comparison of V2V Chargers for Flexible Grid Integration," *IEEE Trans. Ind. Appl.*, under second major review.
- [16] S. Harasis, H. Abdelgaber, Y. Sozer, **M. Kisacikoglu**, "A center of mass determination for optimum placement of renewable energy sources in microgrids," *IEEE Trans. Ind. Appl.*, under review.
- [17] R. Buckreus, R. Aksu, **M. Kisacikoglu**, M. Yavuz, B. Balasubramanian, "Optimization of multi-port DC fast charging stations operating with power cap policy," *IEEE Trans. Transport. Electrific.*, under review.

- [18] E. Y. Ucer, **M. C. Kisacikoglu**, M. Yuksel, A. Gurbuz, "Data-driven, internet-inspired, and scalable EV charging for MV/LV distribution grid," IEEE Trans. Smart Grid, under review.

### Papers in Refereed Conference Proceedings

- [1] **M. C. Kisacikoglu**, M. Uzunoglu, M. S. Alam, "Fuzzy logic control of a fuel cell/ultra-capacitor hybrid vehicular power system," presented at the IEEE Vehicle Power Propulsion Conf., Sep. 2006.
- [2] **M. C. Kisacikoglu**, M. Uzunoglu, M. S. Alam, "Fuzzy logic control of a fuel cell/battery/ultra-capacitor hybrid vehicular power system," in IEEE Vehicle Power Propulsion Conf., Sep. 2007, pp. 591–596.
- [3] **M. C. Kisacikoglu**, B. Ozpineci, L. M. Tolbert, "Examination of a PHEV bidirectional charger system for V2G reactive power compensation," in IEEE Applied Power Electron. Conf. Expo. (APEC), Feb. 2010, pp. 458–465.
- [4] **M. C. Kisacikoglu**, B. Ozpineci, L. M. Tolbert, "Effects of V2G reactive power compensation on the component selection in a plug-in hybrid electric vehicle bidirectional charger," in IEEE Energy Conversion Congr. Expo. (ECCE), Sep. 2010, pp. 870–876.
- [5] **M. C. Kisacikoglu**, B. Ozpineci, L. M. Tolbert, F. Wang, "Single-phase inverter design for V2G reactive power compensation," in IEEE Applied Power Electron. Conf. Expo. (APEC), Mar. 2011, pp. 808–814.
- [6] **M. C. Kisacikoglu**, B. Ozpineci, L. M. Tolbert, "Reactive power operation analysis of a single-phase EV/PHEV bidirectional battery charger," in IEEE Int. Conf. Power Electron. ECCE Asia (ICPE&ECCE), May 2011, pp. 585–592.
- [7] T. S. Ustun, U. Cali, **M. C. Kisacikoglu**, "Energizing microgrids with electric vehicles during emergencies," presented at the IEEE INTELEC, Osaka, Japan, Oct. 2015.
- [8] F. Erden, **M. C. Kisacikoglu**, O. H. Gurec, "Examination of EV-Grid integration using real driving and transformer loading data," in ELECO, Nov. 2015, pp. 364–368.
- [9] **M. C. Kisacikoglu**, F. Erden, N. Erdogan, "A distributed smart PEV charging algorithm based on forecasted mobility energy demand," in IEEE Global Conf. Signal Informat. Process., Dec. 2016, pp. 911–915.
- [10] E. Bulut, **M. C. Kisacikoglu**, "Mitigating range anxiety via vehicle-to-vehicle social charging system," presented at the IEEE Vehicular Tech. Conf. (VTC), Jun. 2017.
- [11] B. Roberts, K. Akkaya, E. Bulut, **M. C. Kisacikoglu** "An Authentication framework for electric vehicle-to-electric vehicle charging applications," in Int. Conf. Mobile Ad Hoc Sensor Syst., Oct. 2017, pp. 565–569.
- [12] E. Y. Ucer, **M. C. Kisacikoglu**, M. Yuksel, "Analysis of an Internet-inspired EV charging network in a distribution grid," presented at the IEEE PES Transmission&Distribution Conf., Denver, CO, Mar. 2018.
- [13] **M. C. Kisacikoglu**, "A Modular Single-Phase Bidirectional EV Charger with Current Sharing Optimization," IEEE Transport. Electrific. Conf. (ITEC), Jun. 2018.

- [14] E. Y. Ucer, **M. C. Kisacikoglu**, F. Erden, A. Meintz, C. Rames, "Development of a DC Fast Charging Station Model for use with EV Infrastructure Projection Tool," IEEE Transport. Electrific. Conf. (ITEC), Jun. 2018.
- [15] E. Y. Ucer, **M. C. Kisacikoglu**, A. C. Gurbuz, "Learning EV integration impact on a low voltage distribution grid," presented at the IEEE PES General Meeting, Aug. 2018.
- [16] M. A. Rahman, **M. Kisacikoglu**, K. Akkaya, B. Akin, "Emerging cyber-physical power electronics attacks in autonomous electric vehicles," IEEE PELS CyberPELS Workshop, May 2019.
- [17] E. Y. Ucer, R. Buckreus, **M. C. Kisacikoglu**, E. Bulut, M. Guven, Y. Sozer, and L. Giubbolini, "A flexible V2V charger as a new layer of vehicle-grid integration framework," presented at the IEEE Transport. Electrific. Conf. (ITEC), Jun. 2019.
- [18] S. Harasis, S. Chowdhury, M. E. Haque, **M. C. Kisacikoglu**, L. Erzen, and Y. Sozer, "Si-Carbide based Interleaved Bi-Directional DC-DC Converter Design for High Power Density Fast Charging Station," presented at the IEEE Transport. Electrific. Conf. (ITEC), Jun. 2019.
- [19] E. Y. Ucer, **M. C. Kisacikoglu**, M. Yuksel, "Analysis of AIMD algorithm for EV charging," in Proc. 10th ACM Int. Conf. Future Energy Syst., Jun. 2019, pp. 436–438.
- [20] E. Y. Ucer, **M. C. Kisacikoglu**, M. Yuksel, "Analysis of Decentralized AIMD-based EV Charging Control" presented at IEEE PES General Meeting, Aug. 2019. [**PES GM 2019 prize paper award.**]
- [21] J. Wang, E. Y. Ucer, S. Paudyal, **M. C. Kisacikoglu**, M. A. I. Khan, "Distribution grid voltage support with four quadrant control of electric vehicle chargers" presented at IEEE PES General Meeting, Aug. 2019.
- [22] E. Ucer, N. Erdogan, S. Rahman, **M. Kisacikoglu**, "Real-time simulation of EV grid integration with internet-inspired charging control," 3rd E-Mobility Power System Integration Symp., Oct. 2019.
- [23] R. Buckreus, S. Jimenez, **M. Kisacikoglu**, A. Lemmon, T. Freeborn, "Flexible over-current protection scheme for medium-voltage WBG power modules in DPT application," IEEE Transport. Electrific. Conf. (ITEC), Jun. 2020.
- [24] B. Fu, A. Shahabi, T. J. Freeborn, A. N. Lemmon, **M. Kisacikoglu**, "Experimental Validation of CT-Snubber for Multichip SiC MOSFET Power Module," IEEE Int. Midwest Symp. Circuits Syst. (MWSCAS), Aug. 2020.
- [25] M. A. Rahman, M. T. Rahman, **M. Kisacikoglu**, K. Akkaya, "Intrusion detection systems-enabled power electronics for unmanned aerial vehicles," IEEE CyberPELS Workshop, Oct. 2020.
- [26] E. Ucer, **M. Kisacikoglu**, A. Gurbuz, S. Rahman, M. Yuksel, "A machine learning approach for understanding power distribution system congestion, in IEEE Energy Conversion Congr. Expo. (ECCE), Oct. 2020.
- [27] S. Rahman E. Ucer, **M. Kisacikoglu**, "Impact of high-level controller actions on local active end-nodes in a distribution grid," accepted to be presented at IEEE Innovative Smart Grid Technol., 2021.

- [28] R. Buckreus, **M. Kisacikoglu**, M. Yavuz, B. Balasubramanian, R. Aksu, "Analyzing quality of service and operation costs of a multi-port DC fast charging station," accepted to be presented at IEEE Innovative Smart Grid Technol., 2021.

### **Patents**

- [1] **M. C. Kisacikoglu**, A. Lemmon "Power Electronics Charge Coupler for Vehicle-to-Vehicle Fast Energy Sharing" U.S. Patent Appl. 62/592,673, Oct. 2017

### **Technical reports**

- [1] **M. C. Kisacikoglu**, A. Bedir, B. Ozpineci, L. M. Tolbert, "PHEV-EV charger technology assessment with an emphasis on V2G operation," ORNL/TM-2010/221, Oak Ridge National Laboratory, Mar. 2012.

### **Invited Presentations**

- [1] **M. C. Kisacikoglu** "Overview of Electric Energy Systems" Invited Tutorial, Electricity Markets Certificate Program, Electric Distribution Services Society (ELDER), 15-19 Dec. 2014.
- [2] **M. C. Kisacikoglu** "Electric Vehicles and Smart Grid Integration" Invited Tutorial, Chamber of Electrical Engineers (EMO), Ankara Branch, May 27, 2015.
- [3] **M. C. Kisacikoglu**, T. Markel, A. Meintz, J. Zhang, M. Jun "EV-Grid Integration (EVGI) Control and System Implementation—Research Overview" Invited Industry Presentation, IEEE Applied Power Electron. Conf. Expo. (APEC), Long Beach, CA, 2016.
- [4] **M. C. Kisacikoglu**, "EV-Grid Integration: Challenges and Solutions," Invited Presentation at Tennessee Tech University, Cookeville, TN, March 15, 2018.
- [5] **M. C. Kisacikoglu**, "EV-Grid Integration: Challenges and Solutions," Invited Presentation at University of Tennessee, Knoxville, TN, March 16, 2018.
- [6] **M. C. Kisacikoglu**, "EV-Grid Integration: Challenges and Recent Solutions," Invited Presentation at University of Central Florida, Orlando, FL, July 30, 2018.
- [7] **M. C. Kisacikoglu**, "EV-Grid Integration: Challenges and Recent Solutions," Invited Presentation at Mississippi State University, Starkville, MS, November 28, 2018.
- [8] **M. C. Kisacikoglu**, "Internet-Inspired Operation and Control for EV Grid Integration," Invited Presentation at Oak Ridge National Laboratory, Knoxville, TN, April 29, 2019.

## Teaching

<sup>†</sup> Student evaluation score. Scale: 0–5.

Semester	Course	Instit.	# of Stud.	Course Overall <sup>†</sup>	Instruct. Contrib. <sup>†</sup>	Instruct. Prepared. <sup>†</sup>
Fall 2020	ECE451/551 Power Electronics	UA	43	4.16	4.29	4.62
Spring 2020	ECE 350, Electric Power and Machines	UA	67	3.68	3.96	4.44
Fall 2019	ECE 350, Electric Power and Machines	UA	32	3.85	4.15	4.40
Spring 2019	ECE 350, Electric Power and Machines	UA	69	3.44	3.86	4.51
Fall 2018	ECE 350, Electric Power and Machines	UA	27	4.50	4.75	4.75
Spring 2018	ECE 350, Electric Power and Machines	UA	50	3.38	3.28	3.85
Fall 2017	ECE 693, Electric Drive Vehicles	UA	7	3.80	4.00	N/A
Fall 2017	ECE 350, Electric Power and Machines	UA	27	3.53	3.80	4.47
Spring 2017	ECE 350, Electric Power and Machines	UA	62	3.56	3.79	4.41

## Professional Activities

### Important IEEE Roles

- *Associate Editor*, IEEE Transactions on Industry Applications, 2014–present
- *Associate Editor*, IEEE Transactions on Vehicular Technology, 2018–present
- *Secretary*, Transportation Systems Committee, Industrial Power Conversion Systems Department, IEEE Industry Applications Society, 2017–present

### IEEE Conferences

- Track Chair, IEEE Applied Power Electronics Conference (APEC), 2020, 2021
- Track Chair, IEEE Energy Conversion, Congress, and Expo. (ECCE), 2020, 2021
- Session Chair, DC/DC Converter Design and Control, IEEE Transportation Electrification Conference and Expo (ITEC), 2019
- Session Chair, Non-Grid Related Topics, IEEE PELS CyberPELS Workshop, Knoxville, TN, 2019
- Session Chair, Drives & Inverters: Parameter Identification, Measurement & Diagnostics, IEEE Applied Power Electronics Conference, Anaheim, CA, 2019
- Session Chair, (i) SiC Device Monitoring and Protection, (ii) Health and Condition Monitoring of Energy Storage Systems, IEEE Energy Conversion Conf. and Expo. (ECCE), Portland, OR, 2018
- Session Co-Chair, North American Power Symposium, Morgentown, VW, 2017
- Track Co-Chair, Electric Vehicles, Vehicular Electronics, and Intelligent Transportation, IEEE Vehicle Technologies Conf. Fall 2017

- Session Chair, Power Electronics for Utility Interface, IEEE Applied Power Electronics Conference, 2011.

### University Service

- Member, ECE Dept. Undergraduate Education Committee, University of Alabama, 2016 - 2018
- Member, EE Dept. ABET Committee, Hacettepe University, 2014 – 2015
- Member, EE Dept. Graduate Education Committee, Hacettepe University, 2015
- Member, EE Dept. Graduate Admissions Committee, Hacettepe University, 2015

### Public Service

- Proposal Reviewer, National Science Foundation, December 2019
- Proposal Reviewer, National Science Foundation, October 2019
- Proposal Reviewer for Oak Ridge Associated Universities, Oak Ridge, 2019
- Proposal Reviewer, National Science Foundation, March 2018
- Proposal Reviewer, The Scientific and Technological Research Council of Turkey (TUBITAK), 2014, 2015
- Proposal Reviewer, Hacettepe R&D Incubation Company, 2014, 2015
- Proposal Reviewer, Small and Medium Enterprises Development Organization, Ankara, Turkey, 2015

### Current Graduate Students - Major Advisor

Name	Degree Program	Start Date	Expected Completion Date
Aziz Ucer	Ph.D.	Aug. 2020	2025
Shahinur Rahman	Ph.D.	Aug. 2019	Dec. 2022
Emin Ucer	Ph.D.	Jan. 2017	Dec. 2021
Parker Smith	M.S.	Aug. 2019	May 2021

### Previous Graduate Students - Major Advisor

- [3] Ramona Buckreus, M.S. December 2020  
Thesis: Optimization of Multi-Port DC Fast Charging Stations Operating with Power Cap Policy
- [2] Emin Ucer, M.S. December 2019  
Thesis: Additive Increase-Multiplicative Decrease Control of Charging Rate to Enable Mass EV-Grid Integration



[1] Faik Elvan, M.S. [@ H.U.] December 2017 Thesis: Design of a Smart Grid Compatible, Bidirectional Modular Battery Charger for Plug-in Electric Vehicles

### **Graduate Student Committee Member**

<b>Name</b>	<b>Degree Program</b>	<b>Graduation Date</b>	<b>Major Advisor</b>
Marshal Olimmah	Ph.D.		A. Lemmon
Hoyun Won	Ph.D.		Y. Hong
Jin Zhao	Ph.D.		A. Lemmon
Blake Nelson	Ph.D.	Dec. 2020	A. Lemmon
Ali Shahabi	Ph.D.	Aug. 2020	A. Lemmon
Ahmetcan Uralcan	M.S. [@HU]	Dec. 2014	I. Cadirci
Cagin Baris Cengiz	M.S. [@HU]	Aug. 2014	U. Sezen