## Amir Shahirinia

Contact Information	Electrical and Computer Engineering University of the District of Columbia 4200 Connecticut Ave. NW Bldg. 42, Rm 109B Washington DC 20008		tel: (+1) 202 274-6917 fax: (+1) 202 274-6311 e-mail: amir.shahirinia@udc.edu web: www.shahirinia.com				
Education	• Ph.D. Electrical & Computer Engineering, University of Wisconsin–Milwaukee, Milwaukee, WI, USA, January 2010–May 2015.						
	• M.Sc., Electrical Engineering, K.N. Toosi University of Technology, Tehran, Iran, August 2003– July 2005.						
	• B.Sc., Electrical Engineering, K.N. Toosi University of Technology, Tehran, Iran, August 1998– July 2003.						
Research	Power & Energy Systems	Power Electronics & Motor Da	otor Drives				
Interests	Renewable Energy	$Electric \ Vehicles, \ V2G$	Vehicles, V2G				
	AI Applications in Smart Grids	Data Science, Bayesian Statist	yesian Statistics				
Awarded Funding	<ul> <li>Amir Shahirinia (Sole-PI), "Predictive Models for Wind-Penetrated Power Systems Using the Bayesian Approach", National Science Foundation (NSF-RIA), Award: \$275,420, Jun. 2019–May 2024.</li> <li>Amir Shahirinia (PI), Esther Ososanya (Co-PI), Jiajun Xu (Co-PI), Wagdy Mahmoud (Co-PI), "Acquisition of Advanced Robotics and Autonomous Vehicle Technology (AR-AVT) for Research in Smart Grid Systems, Teaching, and K-12 Outreach at the University of the District of Columbia", Department of Defense (DoD), Award: \$391,796, Mar. 2020–Mar. 2021.</li> <li>Wagdy Mahmoud (PI), Amir Shahirinia (Co-PI), Nian Zhang (Co-PI), "Workforce De-</li> </ul>						
	<ul> <li>Kate Klein (PI), Amir Shahirinia (Co-PI), Pradeep Behera (Co-PI), Lara Thompson (Co-PI), Zeinab Farahmandfar (Co-PI), Pawan Tyagi (Co-PI), Lei Wang (Co-PI), Sasan Haghani (Co-PI), Esther Ososanya (Co-PI), Jiajun Xu (Co-PI), "Professional Research Experience Program at the University of the District of Columbia", National Institute of Standards and Technology (NIST-PREP), Award: \$6,800,000, Aug. 2018–Jul. 2023.</li> <li>Amir Shahirinia (PI), Zeinab Farahmandfar (Co-PI), Pradeep Behera (Co-PI), "Development of Streamflow Prediction Model and Software Package for Anacostia River at Non-Gauged Locations based on Bayesian Approach", DC Water Resources Research Institute (DCWRRI), Award: \$29,965, Jun. 2019–Dec. 2020</li> </ul>						
	<ul> <li>Zeinab Farahmandfar (PI), Amir Shahirinia (Co-PI), Pradeep Behera (Co-PI), "Resilience-Based Water Infrastructure Rehabilitation Planning in the District of Columbia", DC Water Resources Research Institute (DCWRRI), Award: \$29,965, Sep. 2019–Dec. 2020.</li> </ul>						

PENDING RESEARCH • Amir Shahirinia (Sole-PI), "Novel Non-Isolated High-Gain DC-DC Converter for FUNDING Photovoltaic Applications", National Science Foundation (NSF-EPCN), Award: \$550,000, Dec. 2023-Dec. 2028.

- Amir Shahirinia (Sole-PI), "Center of Excellency for Investigating State of Health and Remaining Lifetime of Power Systems", National Science Foundation (NSF-SBIR), Award: \$255,051. Nov. 2023-Aug. 2024.
- Saeid Haghbin (PI), Amir Shahirinia (Co-PI), Alireza Khaligh (Co-PI), "Modular and Reconfigurable Energy Storage System with Integrated Charging for eVTOL Applications", National Aeronautics and Space Administration (NASA-SNPIRES), Award: \$6,000,000, Dec. 2023-Nov. 2026.
- Amir Shahirinia (PI), Alireza Khaligh, Mohammad Hajiaghayi, "Advance Health Monitoring of Renewable-Penetrated Power Systems Using Artificial Intelligence and Multi-Agent Robotics System", Department of Energy (DoE–WETO), Award: \$3,000,000, (To be submitted).
- Amir Shahirinia (PI), Alireza Khaligh, "A Novel Design and Implementation of EMI Noise Reduction Technique for Onboard Isolated Chargers", National Science Foundation (NSF-EPCN), Award: \$550,000, (To be submitted).
- A.Hajizadeh, *Amir Shahirinia*, D.C.Yu, Chapter 13, "Power Control of Plug-in Electric Vehicles in Smart Grids", Autonomous Hybrid Vehicles: Intelligent Transport Systems and Automotive Technologies, NOVA Science Publishers, INC., ISBN: 978-606-560-327-1, 2014.
- REFEREED JOURNAL R. Amjadifard, M. Tavakoli Bina, H. Khaloozadeh, F. Bageroskuee, *Amir Shahirinia*, "Sug-PUBLICATIONS gesting a Non-Unity Turn Ratio Two-Winding Coupled Inductor for Filtering CM EMI Noise in an SRC", *IEEE Transaction on Consumer Electronics*, 10.1109/TCE.2023.3287982, 2023.
  - H. Jalat, S.G. Liasi, M. Tavakoli Bina, *Amir Shahirinia*, "Optimal Placement of STATCOM Using a Reduced Computational Burden by Minimum Number of Monitoring Units Based on Area of Vulnerability", *IET Generation, Transmission & Distribution*, 10.1049/gtd2.12804, 2023.
  - S. Abbasian, M. Farsijani, M. Tavakoli Bina, *Amir Shahirinia*, A. Abrishamifar, A. Hosseini, "An Interleaved Non-Isolated High Gain Soft Switching DC-DC Converter with Small Input Current Ripple", *IET Power Electronics*, 10.1049/pel2.12425, 2023.
  - S. Rezazade, *Amir Shahirinia*, R. Naghash, N. Rasekh, E. Afjei, "A Novel Efficient Hybrid Compensator for Wireless Power Transfer", *IEEE Transaction on Industrial Electronics*, 10.1109/TIE. 2022.3169840, 2022.
  - S. Abbasian, M. Farsijani, M. Tavakoli Bina, *Amir Shahirinia*, "A Nonisolated Common-Ground High Step-Up Soft-Switching DC–DC Converter With Single Active Switch", *IEEE Transaction on Industrial Electronics*, 10.1109/TIE.2022.3198262, 2022.
  - A. Saleki, M. Tavakoli Bina, *Amir Shahirinia*, "Suggesting Hybrid HB and Three-Quarter-Bridge MMC-Based HVDC Systems: Protection and Synchronous Stability Under DC Faults", *IEEE Transaction on Power Delivery*, 10.1109/TPWRD.2021.3114297, 2021.
  - S. B. Henderson, *Amir Shahirinia*, M. Tavakoli Bina, "Bayesian Estimation of Copula Parameters for Wind Speed Models of Dependence", *IET Renewable Power Generation*, 10.1049/rpg2.12297, 2021.

- V. Tanoe, *Amir Shahirinia*, M. Tavakoli Bina, "Bayesian and Non-Bayesian Regression Analysis Applied on Wind Speed Data", *Journal of Renewable and Sustainable Energy (JRSE)*, 10.1063/5.0056237, 2021.
- A. Naderi, K. Abbaszadeh, M. Moradzadeh, *Amir Shahirinia*, "High Gain Bidirectional Quadratic DC-DC Converter Based on Coupled Inductor with Current Ripple Reduction Capability", *IEEE Transaction on Industrial Electronics*, TIE.2020.3013551, 2020.
- M.A. Ehsan, *Amir Shahirinia*, N. Zhang, "Investigation of Data Size Variability in Wind Speed Prediction Using AI Algorithms", *Taylor & Francis, Cybernetics and Systems Journal*, 01969722.2020.1827796, 2020.
- M.M. Rana, *Amir Shahirinia*, "Distributed Dynamic State Estimation Considering Packet Losses in Interconnected Smart Grid Subsystems: Linear Matrix Inequality Approach", *IEEE Access*, 10.1109 ACCESS.2019.2949995, 2019.
- M.R. Kikhavandi, A. Hajizadeh, *Amir Shahirinia*, "Charging Coordination and Load Balancing of Plug-in Electric Vehicles in Unbalanced Low voltage Distribution Systems", *IET Generation*, *Transmission & Distribution*, 10.1049/iet-gtd.2019.0397, 2019.
- M.R. Baghayipour, A. Hajizadeh, *Amir Shahirinia*, Z.Chen, "Dynamic Placement Analysis of Wind Power Generation Units in Distribution Power Systems", *International Journal of Energies*, 11(9), 2326, 2018.
- Amir Shahirinia, E. Soofi, D.C. Yu, "Probability Distributions of Outputs of Stochastic Economic Dispatch", International Journal of Electrical Power and Energy Systems (ELSEVIER), 81 (2016) 308–316, 2016.
- A. Hajizadeh, *Amir Shahirinia*, D.C. Yu, "Self-Tuning Indirect Adaptive Control of Non-Inverting Buck-Boost Converter", *IET Power Electronics*, pp. 1–8, ISSN 1755-4535, Jul. 2015.
- A. Hajizadeh, *Amir Shahirinia*, D.C. Yu, "Fuzzy Control of Hybrid Diesel Generator/Fuel Cell/Energy Storage Power Sources for Marine Power System", *Journal of Fuel Cell Science and Technology (ASME)*, Vol. 12. N. 2, No. FC-13-1070, Jan. 2015.
- Amir Shahirinia, A. Hajizadeh, D.C. Yu, A. Feliachi, "Control of a Hybrid Wind Turbine/Battery Energy Storage Power Generation System Considering Statistical Wind Characteristics", *Journal* of Renewable and Sustainable Energy (JRSE), Vol. 4, 2012.
- P. Naderi, *Amir Shahirinia*, O.P. Malik, "Power System Stabilization Using Optimal Placement of Stabilizers and Design of Local Robust Controllers", *International Review of Automatic Control (IREACO)*, Vol. 2. n. 2, pp. 163-169- Mar. 2009.
- Amir Shahirinia, A. Radan, "Novel Carrier-Based PWM Methods for Multi-Level Inverters", Taylor & Francis, European Power Electronics & Drives (EPE), Vol. 18, No. 2, 2008.
- Amir Shahirinia, S.M.M. Tafreshi, A. Hajizadeh, A.R. Moghaddmjoo, "Genetic-Based Size Optimization of Wind Energy", International Journal of Power and Energy Systems (ACTA Press), Vol. 28, No. 1, 2008.
- Amir Shahirinia, S.M.M. Tafreshi, A. Hajizadeh, A.R. Moghaddmjoo, "Optimal Design of Wind/PV Stand-Alone Hybrid Power System Using Genetic Algorithm", Journal of Iranian Association of Electrical and Electronics Engineers (IAEEE), Vol.3, No.2, Fall and winter 2006.

Under Review Journal Publications

- Amir Shahirinia, V. Tanoe, M. Tavakoli Bina, M. Ashtary, "Multi-Site Wind Farms Dependence Structure Using Vine Copulas: Impact of Dataset Sizes and Employed Copulas", *IET Renewable Power Generation*.
- S.G. Liasi, M. Tavakoli Bina, *Amir Shahirinia*, "Optimal Placement of Electric Vehicles Charging Station Using Comprehensive Accurate Model of Electric Vehicles' Behavior in Cities", *IEEE Transaction on Power Systems*.
- S.Rezazade, *Amir Shahirinia*, R. Naghash, S. E. Afjei, M. Tavakoli Bina, "A Novel Wireless Power Transfer Systems Efficiency Calculation Using Real-Time Parameter Estimation", *IEEE Transaction on Industrial Electronics*.

Conference Proceedings

- P. Farhadi, S.M.M. Tafreshi, *Amir Shahirinia*, "Multivariate Dependence Modeling of Electric Vehicle Charging Stochastic", *IEEE International Conference on Smart Energy Grid (SGC 2022)*, Kerman, Iran, 13-15 Dec. 2022.
- H. Jalalat, M. Tavakoli Bina, *Amir Shahirinia*, "Optimal Location of Voltage Sags Monitors by Determining the Vulnerable Area of Network Buses", *IEEE International Conference on Smart Grid (SGC2021)*, Tabriz, Iran, 16-18 Dec. 2021.
- M.A. Ehsan, *Amir Shahirinia*, N. Zhang, J. Gill, "Dependent Wind Speed Models: Copula Approach", *IEEE International Conference on Electric Power & Energy Conference (EPEC)*, Edmonton, Canada, 9-15 Nov. 2020.
- M.A. Ehsan, *Amir Shahirinia*, N. Zhang, T. Oladunni, "Wind Speed Prediction and Visualization Using Long Short-Term Memory Networks (LSTM)", *IEEE International Conference on Information Science and Technology (ICIST)*, Bath, London, 9-15 Sep. 2020.
- M.M. Rana, *Amir Shahirinia*, B.J. Choi, "Compute Process and Measurement Noise Covariances for Human Motion Estimation: A Kalman Filter Approach with IoT Sensors", *IEEE International Conference on Cyber Technology in Automation (CTACI)*, Suzhou, China, Jul. 29-Aug. 2, 2019.
- B. Azimian, A. Helmzadeh, *Amir Shahirinia*, "Minimization of Ohmic Losses in Power Networks by Utilization of Interphase Power Controllers", *IEEE International Conference on North American Power Symposium (NAPS)*, North Dakota, USA, 9-11 Sep. 2018.
- P. Mohammadi, B. Azimian, *Amir Shahirinia*, "A Novel Double-Loop Control Structure Based on Fuzzy-PI and Fuzzy-PR Strategies for Single-Phase Inverter in Photovoltaic Application", *IEEE International Conference on North American Power Symposium (NAPS)*, North Dakota, USA, 9-11 Sep. 2018.
- Amir Shahirinia, A. Hajizadeh, D.C. Yu, "Bayesian Predictive Models for Rayleigh Wind Speed", *IEEE International Conference on Ubiquitous Wireless Broadband (ICUWB)*, Salamanca, Spain, 12-15 Sep. 2017.
- Amir Shahirinia, A. Hajizadeh, D.C. Yu, "Bayesian Predictive Models of Economic Dispatching for Wind-Penetrated Power Systems", *IEEE International Conference on Ubiquitous Wireless Broadband (ICUWB)*, Salamanca, Spain, 12-15 Sep. 2017.
- Amir Shahirinia, A. Hajizadeh, "Model Predictive Control of Grid Connected Modular Multilevel Converter for Integration of Photovoltaic Power Systems", *IEEE International Conference* on Photovoltaic Specialists (PVSC), Washington, DC., USA, 25-30 Jun. 2017.

- Amir Shahirinia, R. Tallam, "Simulation Model for Multi-Winding Transformers for Switched Mode Power Supply", *IEEE International Conference on Energy Conversion Congress and Exposition (ECCE)*, Milwaukee, Wisconsin, USA, 18-22 Sep. 2016.
- Amir Shahirinia, A. Hajizadeh, S. Arabameri, D.C. Yu, "State of Charge Estimation of Battery Energy Storage for Solar Power Systems", *IEEE International Conference on Renewable Energy Research and Applications (ICRERA)*, Milwaukee, USA, 19-22 Oct. 2014.
- Amir Shahirinia, A. Hajizadeh, D.C. Yu, "Robust Control of Hybrid Wind/Energy Storage Power Generation System Considering Statistical Wind Characteristics", *IEEE International Conference on Power and Energy (PECON)*, Kota Kinabalu, Sabah, Malaysia, 2-6 Dec. 2012.
- Amir Shahirinia, A. Hajizadeh, D.C. Yu, "Power Control of Autonomous Hybrid Diesel Generator/ Fuel Cell Marine Power System Combined with Energy Storage", *IEEE International Conference on Power and Energy (PECON)*, Kota Kinabalu, Sabah, Malaysia, 2-6 Dec. 2012.
- Amir Shahirinia, A. Radan, M. Falahi, "Evaluation of carrier-Based PWM Methods for Multilevel Inverters", *IEEE International Symposium on Industrial Electronics (ISIE)*, Vigo, Spain, 4-7 Jun. 2007.
- Amir Shahirinia, A. Hajizadeh, P. Naderi, A.R. Moghaddmjoo, "The Best Size Planning of a PV/Wind, Local Remote Hybrid Power System", *IEEE International Conference on Electrical Engineering (ICEE)*, Tehran, Iran, 16-18 May 2006.
- P.Naderi, *Amir Shahirinia*, S.M.T. Bathaee, B. Labibi, "A New Approach in Decentralized Control of Multi-Machines Large Scale Power System", *IEEE International Conference on Electrical Engineering (ICEE)*, Tehran, Iran, 16-18 May 2006.
- Amir Shahirinia, S.M.M. Tafreshi, A. Hajizadeh, A.R. Moghaddmjoo, "Optimal Sizing of Wind, PV Hybrid Power System Using Genetic Algorithm", *IEEE International Conference on Future Power Systems (FPS)*, Amsterdam, Netherlands, 16-18 Nov., 2005.
- *Coordinator, IEEE UDC Student Branch*, University of the District of Columbia, Washington D.C., Sep. 2022–Present.
  - Chair, ECE Curriculum Development Committee, University of the District of Columbia, Washington D.C., May. 2022–Present.
  - *Director, ECE Undergraduate Program*, University of the District of Columbia, Washington D.C., Dec. 2021–Present.

Professional Experience

SERVICE TO

PROFESSION

- Associate Professor, University of the District of Columbia, Washington D.C., Jun. 2023– Present.
  - Assistant Professor, University of the District of Columbia, Washington D.C., Jan. 2017–Jun. 2023.
  - **Post-Doctoral Fellow**, Power Electronics Group, Rockwell Automation (Allen Bradly), Milwaukee, WI, USA, May 2015–Dec. 2016.
  - Editorial Board Member, Smart Grid Section, Frontiers in Energy Research, Dec. 2022-

Present.

•	Director, Smart Grid & Artificial Intelligence	<i>(SGAI)</i> ,	University	of the	District	of
	Columbia, Washington D.C., Nov. 2020–Present.					

• Director, Center of Excellence for Renewable Energy (CERE), University of the District of Columbia, Washington D.C., May 2017–Present.

Online Certificates

- Cybersecurity: Managing Risk in the Information Age, Harvard University, Sep. 2020 Dec. 2020.
- Artificial Intelligence: Implications for Business Strategy, Massachusetts Institute of Technology (MIT), Oct. 2019 Jan. 2020.

RESEARCH SUPERVISING

- Dr. Md Msoud Rana, Postdoc, Spring 2019–Fall 2020.
- Vincent Tanoe, Ph.D., Fall 2019–Fall 2022.
- Tewodros Mamo, Ph.D., Spring 2021–Present.
- Luis Hernandez, M.Sc., Fall 2022–Present.
- Gavin Robinson, M.Sc., Fall 2022–Present.
- Saul B. Henderson, M.Sc., Fall 2018–Fall 2020.
- Amimul Ehsan, M.Sc., Spring 2018–Spring 2020.

Professional Memberships

- IEEE Senior Member, Jan. 2022–Present.
  - IEEE Industrial Electronics Society, Jan. 2014–Present.
  - IEEE Power & Energy Society, Jan. 2010–Present.

Honors and Awards

- **Outstanding Professor**, Rating 4 out of 4.00 (Teaching 4 out of 4 with %50 weight, Research 4 out of 4 with %40 weight, administrative 4 out of 4 with %10 weight), University of the District of Columbia, Academic Year 2020-2021.
  - Chancellor Award, Academic Excellence, University of Wisconsin-Milwaukee, Fall 2014, Spring 2014, Fall 2013, Spring 2013, Fall 2012, Spring 2012, Fall 2011, Spring 2011, Fall 2010, Spring 2010.
  - Outstanding Teaching Assistant, University of Wisconsin Milwaukee, Spring 2011.
  - Best Paper Award, 7th Annual Green Energy Summit, Milwaukee, WI, USA March 24-26, 2010.
  - Outstanding Research Assistant, K. N. Toosi Univ. of Tech., Fall 2005.

• Outstanding Research Assistant, K. N. Toosi Univ. of Tech., Fall 2004.

Teaching Experience

- Fundamentals of Power Electronics for Energy Systems (ENPM 809M), Graduate Level, University of Maryland College Park.
- Power Electronics (ELEC 420 & ELEC 520), Lecture/Lab, Undergraduate/Graduate Level, University of the District of Columbia.
- Power System Analysis (ELEC 469 & ELEC 473), Lecture/Lab, Undergraduate Level, University of the District of Columbia.
- Control Systems (ELEC 470 & ELEC 477), Lecture/Lab, Undergraduate Level, University of the District of Columbia.
- Electric Machinery (ELEC 461 & ELEC 462), Lecture/Lab, Undergraduate/Graduate Level, University of the District of Columbia, University of Wisconsin-Milwaukee.
- Electric Circuit I (ELEC 220 & ELEC 221), Lecture/Lab, Undergraduate Level, University of the District of Columbia, University of Wisconsin-Milwaukee.
- Electric Circuit II (ELEC 222 & ELEC 223), Lecture/Lab, Undergraduate Level, University of the District of Columbia.
- Electric Circuit I & II Combined (ELEC 225 & ELEC 226), Lecture/Lab, Undergraduate Level, University of the District of Columbia.
- **Renewable Energy Fundamentals**, Lecture, Undergraduate Level, K.N.Toosi University of Technology.
- Signals and Systems, Lecture/Lab, Undergraduate Level, K.N.Toosi University of Technology.
- Digital Circuits, Lecture/Lab, Undergraduate Level, K.N.Toosi University of Technology.
- Analytical Methods of Engineering, Lecture, Undergraduate Level, University of Wisconsin-Milwaukee.

Offered Extra Courses

- Power Electronics for Renewable Energy Systems, Lecture, Undergraduate/Graduate Level.
  - Power System Integration of Renewable Energy, Lecture, Graduate Level.
  - AI Applications in Smart Grids, Lecture, Undergraduate/Graduate Level.
  - Advanced Power Electronics, Lecture/Lab, Graduate Level.
  - Control of Distributed Generation, Lecture/Lab, Undergraduate/Graduate Level.
  - Smart Grid Optimal Planning and Operation, Lecture, Undergraduate/Graduate Level.
  - Inactive Power Harmonics Control, Lecture, Graduate Level.
  - *Electric Power Generation*, Lecture, Undergraduate/Graduate Level.

	• <i>Power Systems Economic Dispatch</i> , Lecture, Graduate Level.			
Synergistic Activities	• <i>Lab Development</i> , Smart Grids & Artificial Intelligence (SGAI), University of the District of Columbia, Fall 2020.			
	• <i>Graduate Course Development</i> , Fundamentals of Power Electronics for Energy Systems, University of Maryland, Fall 2018.			
	• Algorithm & Software Package Development, Hybrid Power Systems Designer (HPSD), UDC SGAI lab, Dec. 2020.			
	• Science of Learning Contribution, Effective Teaching Workshop, May 2020.			
	• Short Course Development, Renewable Energy & Smart Grids, Alfred University, 2016.			
	• Broadening the Participation of Groups of Underrepresented in STEM, Renewable Energy Engineering Society (REES), Alfred University, 2016.			
References	• Dr. A. Khaligh, University of Maryland College Park, USA, khaligh@ece.umd.edu.			
	• Dr. M. Hajiaghayi, University of Maryland College Park, USA, hajiagha@ece.umd.edu.			
	• Dr. R. Baldick, University of Texas at Austin, USA, baldick@ece.utexas.edu.			
	• Dr. D. Yu, University of Wisconsin-Milwaukee, USA, yu@uwm.edu.			

• Dr. M. Tavakoli Bina, K.N.Toosi University of Technology, Iran, tavakoli@eetd.kntu.ac.ir.