Curriculum Vitae
Assist. Prof. Dr. Ahmet ONEN

Abdullah Gul University

Electrical and Electronics Engineering

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Education

- **Ph.D.** Center for Power and Energy, Division of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University (Virginia Tech), VA, USA (Aug. 2010~May 16, 2014)
  Advisor: Prof. Robert Broadwater
  Thesis: 'Economic Evaluation of Smart Grid Technologies'

- **M.S.** Clemson University Electric Power Research Association, Division of Electrical and Computer Engineering, Clemson University, Clemson, SC, USA (Aug. 2008~Aug.2010)
  Advisor: Prof. Elham B. Makram
  Thesis Report: 'An Investigation into Renewable Energy Technologies and Storage Techniques, Technology Gaps and Acceleration for a Greener Environment'

- **(ELS)** English Language School, University of Delaware, Delaware, USA (Mar. 2007 ~ Mar. 2008)

- **M.S.** Mechatronics Engineering, Kocaeli University, Turkey (September. 2005~Marc.2007)
  Advisor: Prof. Huseyin M. Ertunc
  (Non-Completed) Thesis: 'PLC applications on Robotics'

- **B.S.** Gaziantep University, Electrical and Electronics Engineering, Gaziantep, Turkey (Sep. 2000 ~ June. 2005)
  Advisor: Prof. Vedat Karsli
  Thesis: 'Linear Induction Machine Applications for high-speed Train'

Research experience

- **'Model-Based Renewable Resource Risk Assessment Analysis and Simulation'** sponsored by Department of Energy (DOE)
  : Combine and extend existing technology and expertise to develop a model-based renewable generation risk assessment analysis and visualization system.
  - Graph Trace Analysis (GTA) models of distribution and transmission system, renewable resources, time-series customer load data, and SCADA measurements.
  - Web based solar output, variability and uncertainty analysis and information.
  - Prototype development and testing of renewable resource risk analysis and visualization research.
- **'Methods for High Penetration PV Studies'** sponsored by National Renewable Energy Laboratory (NREL)

: The modeling methods will analyze the impacts of high penetration PV interconnection in terms of
- Voltage regulation along the feeder
- Current capacity constraints
- Expected impacts due to fault current contributions from the interconnected PV
- The impacts of implemented anti-islanding functions of the PV inverters
- The increase in the number of line regulator/switched capacitor bank operations caused by the interconnection of PV
- Other analysis discovered to be important to high penetration PV interconnection studies.

- **'Model-Based DC-AC Arc Flash Analysis and Simulation'** sponsored by Detroit Edison Energy (DTE)
  : Combine and extend existing technology and expertise to develop a model-based Arc Flash analysis and visualization system in terms of.
  - Graph Trace Analysis (GTA) models of distribution system, protection coordination, bolted fault calculation, and SCADA measurements.
  - Designed based on IEEE 1584 standard for justification purposes.
  - Prototype development and testing of Arc Flash analysis and visualization research.

- **'Simulating Power Quality Problems due to system Harmonics'** sponsored by Orange and Rockland Utility (ORU)
  - Demonstrate integrated system model applications effectiveness in evaluating a variety of projected system impacts, allowing utilities to better address power quality problems.
  - Demonstrate potential Total voltage and current Harmonic Distortion (THD) and their effect on feeder level.
  - Demonstrate potential impacts from change of the loads in future and get ready system operators for potential harmonic's resonance problems.

- **'Storm Modeling and Restoration of outages for Power Distribution Systems'** sponsored by Orange and Rockland Utility (ORU)
  : This project aims at the development of three new analysis tools for the effective management of distribution system.
  - The First tool is the create a Monte Carlo Simulation that cab pick components from existing system and fail components randomly
  - The second tool is a system isolator and component reconfiguration that isolate system when faults happen, and reconfigure switch positions.
  - The third tool is a restoration of system based on historical outages of components and tries to restore system using different routing.

- **'Cost Benefit Evaluation of Smart Grid Technology'** sponsored by Brookhaven National Laboratory and Electric Power Research Institutes (BNL and EPRI)
  - Build up the Cost function for power system analysis package
  - Write the series of application that shows smart grid implementation will be more efficient, reliable and cost effective.
  - Build up power distribution system and make it ready for smart grid implementation (two projects designed for that: Phase Balanced and Capacitor Design)
  - Designed optimal smart grid by using automated switches and SCADA design
  - Build up the smart grid to provide to defer big investment on distribution substation and system compared with existing system for justifications.
  - Build up the smart grid to provide to faster restoration on distribution substation and system compared with existing system for justifications.

-Build up the smart grid to provide more efficient distribution system and also reduced energy delivered to system compared with existing system for justifications.

- **'Development of new algorithm for Distributed Series Reactance (DSR) for Transmission Line Capacity and imbalance Problem** supported by Smart Grid Wire
  - The real transmission system is designed for New York Independent System Operator (NYISO) based on eleven different zones by using C#
  - Develop efficient and useful power flow software based on Graphics User Interface (GUI)
  - Develop an algorithm to be able to solve overloading problems in transmission lines by using DSR modules.
  - Develop an algorithm to be able to solve imbalance voltage problems at substation transformer by using DSR modules. This algorithm is also tool for imbalanced impedance problem occurred in transmission lines.
  - Develop a tool to calculate optimum number of DSR module implementation on the transmission system instead of building new transmission lines, also saving from capacity improvement is reported.

- **'Creating a new index for load modeling and its implementation'** supported by Electrical Distribution Design (EDD)
  : This project aims at the development of equivalent load modeling to aggregate system loadings such as constant power and constant impedance.
  - Build up user interface to be able to choose voltage dependent load options
  - Updated power Flow Program to be able to run with voltage dependent load options.
  - The new application is written based on Conservation Voltage Reduction with Coordinated Control by using switched Capacitors, Voltage Regulators and ULTC's to be able to use voltage dependency load effectively and prove its efficiency.

- **'Development of feeder performance application using Object-Oriented Programming in Distribution System'** sponsored by Orange and Rockland Utility (ORU)
  : This project established a power flow based program by using *"Managed C++"* language using three-phase models
  - Develop an interface to be able to connect webpage to get cost data online (Cost data is updated each 5 minutes, so connection webpage and get updated cost function is the most effective and accurate way)
  - Created a tool for power system planning engineer to be able to figure out whether their system cost effective and efficient.
  - Created an interface to connect feeder performance application with Phase balancing and Capacitor Design application to help planning engineer for optimal phase moves and switching actions.

Work Experience

- **Virginia Polytechnic Institute and State University, VA, USA (Aug. 10 ~ May 14)**
  Research Assistant, Center for Power and Energy, Division of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA

- **Electrical Distribution Design Inc., Blacksburg, VA (Aug. 10 ~ May 14)**
  I have been a software engineer/researcher at Electrical Distribution Design Inc, Virginia, USA, where I provide utility modeling solutions and application developments for planning and operations. My specialties include distribution system reliability, storm outage and reconfiguration, distributed generation, and smart grid optimization, control, and economic

analysis. I have been created five applications to solve real time industrial solutions to be used in the biggest electric utilities in USA.

- **Kocaeli University Mechatronics Engineering (Mar. 06 ~ Mar. 07)**
  Teaching Assistant in Mechatronic Engineering, Kocaeli University, Kocaeli, Turkey. (Anolog electronics, Electrical machines, Power electronics. Commissioned by instructor, Prof. Metin Ertunc)
  (Process Control and Automation with PLC and Scada. Commissioned by instructor Prof. Ahmet Erdil).
- **Kesir Electric, Istanbul, Turkey (Sep. 05 ~ Mar. 06)**
  Design electrical project and control for its implementation in plants. I was sponsored by Siemens for that project.
- **Tupras, Kocaeli, Turkey (Summer Internship 2003)**
  Summer intern at Tupras, Kocaeli, Turkey. To work on electrical installation, energy, electrical machines.
- **Tupras, Kocaeli, Turkey (Summer Internship 2004)**
  Summer intern at Tupras, Kocaeli, Turkey. To work on process Control with PLC and Scada.

Computer/Programming Skills

Computer language: Fluency in C, C++, C#, Managed C++.
Software: MATLAB, DEW, PowerWorld, PSLF, PSCAD, EasyPower, PSS/E, SQL.

Curricular Activities and Certificates:

- SMC Training Certificates (2007-2008): (Certificates received from each trainings)
  PLC Fundamentals (s7-200/300)
  PLC Advanced (s7300/400)
  Electrical Machines and Drives
  Hydraulic system maintenance and troubleshooting
  Pneumatic systems maintenance and troubleshooting
- Solar energy team, Car Race in Turkey among universities (2006) (Certificate received)

Publications - Journal

1. *Ahmet Onen*, D.Cheng, R. Arghandeh, J. Jung, J. Woyak, M. Dilek, R. Broadwater, "*Smart Model-based coordinated control based on feeder losses, energy consumption, and voltage violations*," Electric power system component and system, vol. 41, issue 16, pages 1686-1696, August, 2013.
2. *Ahmet Onen*, Jeremy Woyak, Reza Arghandeh, Jaesung Jung, Charlie Scirbona, and Robert P. Broadwater, "*Time-varying Cost of Loss Evaluation in Distribution Networks Using Market Marginal Price*," International Journal of Electrical Power and Energy Systems, Elsevier, vol. 62, pages 712-717, June, 2014.
3. *Ahmet Onen*, Danling Cheng, Robert P. Broadwater, Charlie Scirbona, George Cocks, Stephanie Hamilton, Xiaoyu Wang, Jeffrey Roark "*Economic Evaluation of Distribution System Smart Grid Investments*," Electric power system component and system, vol. 41, issue 16, pages 1686-1696, January 2015.
4. *Ahmet Onen*, Jaesung Jung, D. Cheng, and Robert P. Broadwater, "*Model-Centric Distribution Automation: Capacity, Reliability, and Efficiency*," accepted for publication in Electric power system component and system.

5. ***Ahmet Onen***, "*Novel Loss Calculation Technique for accuracy: Randomize Load Curves,*" under review in International Transactions on Electrical Energy Systems, Wiley.

6. ***Ahmet Onen***, "*Conservation Voltage Reduction Energy Saving Calculation from Available Feeder Measurements,*" under review in International Transactions on Electrical Energy Systems, Wiley.

7. Reza Arghandeh, ***Ahmet Onen***, Jaesung Jung, Danling Cheng, Robert P. Broadwater, and Virgilio Centeno, "*Harmonic Interactions of Multiple Distributed Energy Resources in Power Distribution Networks,*" Electric Power System Research, Elsevier, vol. 105, pages 124-133, December, 2013.

8. Jaesung Jung, ***Ahmet Onen,*** Reza Arghandeh, and Robert P. Broadwater, "*Coordinated Control of Automated Devices and Photovoltaic Generators for Voltage Rise Mitigation in Power Distribution Circuits*" Renewable Energy, Elsevier, vol. 66, pages 532-540, June,2014.

9. Jaesung Jung, Yongju Cho, Danling Cheng, ***Ahmet Onen,*** Reza Arghandeh, Murat Dilek, and Robert P. Broadwater, "*Monte Carlo Analysis of Plug-in Hybrid Vehicles and Distributed Energy Resource Growth with Residential Energy Storage in Michigan,*" Applied Energy, Elsevier, vol. 108, pp. 218-235, Aug. 2013.

10. D. Cheng, ***Ahmet Onen***, Dan Zhu, David Kleppinger, Reza Arghandeh, Robert P. Broadwater, Charlie Scirbona "*Automation Effects on Reliability and Operation Costs in Storm Restoration",* Electric power system component and system, vol. 43, issue 6, pages 656-664, March 2015.

11. Reza Arghandeh, Jeremy Woyak, ***Ahmet Onen***, Robert P. Broadwater, Richard Sequin, Haukur Asgeirsson, Nick Carlson "*Economic Control of Distributed Energy Storage Systems in Competitive Energy Markets*," Physics and Society, arXiv, July 2014.

12. Reza Arghandeh, ***Ahmet Onen***, Jaesung Jung, Danling Cheng, Robert P. Broadwater, and Virgilio Centeno, "*Phasor-based assessment for harmonic sources in distribution networks,*" Electric Power System Research, Elsevier, vol. 116, pages 94-105, August, 2014.

13. Jaesung Jung, ***Ahmet Onen,*** Kevin Russell, and Robert P. Broadwater, "*Local Steady-State and Quasi Steady-State Impact Studies of High Photovoltaic Generation Penetration in Power Distribution Circuits*" Renewable and Sustainable Energy Reviews, Elsevier, vol. 43, pages 569-583, March 2015.

14. Reza Arghandeh, Jeremy Woyak, ***Ahmet Onen,*** Jaesung Jung, Robert Broadwater, "Economic optimal operation of Community Energy Storage systems in competitive energy markets", Applied Energy, vol 135, pp 71-80, December 2014.

15. Jaesung Jung, ***Ahmet Onen,*** Danling Cheng, Kevin Russell, and Robert P. Broadwater, "*Configurable, Hierarchical, Model-based, Scheduling Control with Photovoltaic Generators in Power Distribution System*" Renewable Energy, Elsevier, vol 76, pp 318-329, April 2015.

16. Reza Arghandeh, ***Ahmet Onen,*** Jaesung Jung, Danling Cheng, Robert P. Broadwater, "Impact of harmonics from distributed energy resources on distribution networks," Energy-Tech Magazine, May 2014, pages 20-25.

Publications – other publications (non SCI), Conferences and Posters

1. Reza Arghandeh, ***Ahmet Onen***, Jaesung Jung, Danling Cheng, Robert Broadwater, and Virgilio Centeno, "*Harmonic Impact Study for Distributed Energy Resources Integrated into Power Distribution Networks*," published in ASME 2013 Power Conference.

2. M.Kilivan, H.M.Ertunc, S.Kilivan, ***A.Onen***, "3-Eksenli Robota Monte Edilmis Kamera Vasitasıyla Geometrik Cisimlerin Birbirinden Ayirt Edilmesi", Otomatik Kontrol Ulusal Toplantısı, TOK'06, 6-8 Kasım 2006, TOBB Ekonomi ve Teknoloji Üniversitesi, Ankara,Turkey (2006)

3. Reza Arghandeh, ***Ahmet Onen***, and Robert Broadwater, "*Distributed Energy Storage System*

Control for Optimal Adoption of Electric Vehicles" published in PES General meeting 2012.

4. ***Ahmet Onen***, Reza Arghandeh, Kevin Russell and Robert Broadwater, "*Model Centric Distribution Automation – ISM Based Design, Coordinated Control and Operations Management Research and Development"* published in poster section in Advanced Grid Modelling, NC 2013.
5. Reza Arghandeh, ***Ahmet Onen***, Jeremy Woyak and Robert Broadwater, "*Impact Study of Multiple Source Harmonic Interactions with Distributed Energy Resources"* published in poster section in PES General Meeting, CA 2012.
6. Reza Arghandeh, ***Ahmet Onen***, Jeremy Woyak and Robert Broadwater, "*Distributed Energy Storage System Control for Optimal Adoption of Electric Vehicles"* published in PES General meeting 2012.
7. WANG Lingyun, ***Onen Ahmet***, Woyak Jeremy, Arghandeh Reza, Broadwater Robert "*Electric Power Distribution Feeder Performance Evaluation and Distributed Computation*" El-Cezerî Journal of Science and Engineering, vol 2, issue 1, pp 59-67, January 2015.
8. ***Onen Ahmet***, Sukru Kuran "*Günümüzün ve Geleceğin Elektrik Şebekeleri*", TÜBİTAK Bilim ve Teknik Dergisi, pp 84-87, June 2015.
9. ***Onen Ahmet***, Broadwater Robert "*Is the Smart Grid a good investment"* 3. Uluslararası Istanbul akıllı şebekeler kongre ve fuarı, 29-30 April, 2015, Halic Kongre Merkezi, İstanbul.
10. ***Onen Ahmet***, "*Efficiency and Cost Evaluation of Distribution Systems based on Multiple Time Points*" MEPS2015, 6-9 July, 2015, Wroclaw, Poland.
11. D. Cheng, ***Onen Ahmet***, J Jung, R Arghandeh, R Broadwater "*Model Centric Approach for Monte Carlo Assessment of Storm Restoration and Smart Grid Automation",* ASME Power 2014 Conference, page 1-6, July 28-31, 2014, Baltimore, Maryland, USA.

Publications – Report- Short Courses, Contributions, Workshops

- Whitepaper: Brookhaven National Lab Smart Grid Team "The 21st Century grid Distribution Automation: A model-centric Approach" Brookhaven National Lab (BNL) 2012.
- "A Preliminary Estimate of the Investment Requirements and the Resultant Benefits of a Fully Functioning Smart Grid" Electric Power Research Institute (EPRI), 2014 Technical Report.

Awards and Honors

- **Gaziantep University Electrical and Electronics Engineering** awarded to distinguished student who graduated with 3rd. the highest GPA (2005)
- **Post graduate scholarships** awarded to domestic students [Grantor: Ministry of Education] (2007). Full Scholarship for masters and Phd (tuition & expenses) awarded by Turkish Government.