JAESUNG JUNG

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**EDUCATION**

# Doctor of Philosophy in Electrical Engineering

Virginia Polytechnic Institute and State University, Blacksburg, Aug. 2009 ~ May. 2014 GPA: 3.78 / 4.0

# Master of Science in Electrical Engineering

North Carolina State University, Raleigh, Aug. 2007 ~ May. 2009 GPA: 3.37 / 4.0

* **Government academic scholarship supported by Korean Ministry of Commerce, Industry and Energy (Fall 2007 ~ Spring 2009)**

# Bachelor of Science in Electrical Engineering

ChungNam National University, Korea, Feb. 1998 ~ Feb. 2006 GPA: 3.85 / 4.5

# Bachelor of Science in Computer Engineering

ChungNam National University, Korea, Feb. 1998 ~ Feb. 2006 GPA: 3.85 / 4.5

**EXPERTISE AND SKILLS**

* **Power distribution system modeling and simulation**

- **7 years practical experience** of power system modeling and simulation based on utilities requirements

- Develop the several applications in **DEW software**

* **Distributed energy resource analysis (solar and wind generation, storage system, plug-in electric vehicle)**

- Develop the **DER adoption analysis** and **DER impact study** from several projects

* **Solar generation, energy storage optimal control algorithm development and analysis**

- Develop the **optimal control algorithm** for solar generation and energy storage system

* **Wind generation forecasting system**

- Study about existing forecasting system and develop the **frequency domain approach** algorithm

* **Computer language skill:** Fluency in Assembly, **C, C++, C#,** JAVA languages, etc**.**
* **Software skill:** Fluency in **MATLAB, Visual Studio, DEW, PSS/E, PSLF, PSCAD,** etc.
* Excellent written and oral communication skills and publication quality documentation using **Latex, MS office, Visio**
* Proficiency in **Korean**

**RESEARCH EXPERIENCE**

**Modeling and Analysis of the Brookhaven National Laboratory Electric Power Distribution System with DEW/ISM Distribution System Management Software** sponsored by Department of Energy (DOE) – Brookhaven National Lab, Upton

: Integrate DEW/ISM BNL model into BNL’s operation system

**Modeling and Analysis of the PSEG-LI T&D System using DEW/ISM** sponsored by Department of Energy (DOE) – Brookhaven National Lab, Upton

: Development of the PSEG-LI transmission and distribution system model using DEW/ISM

**Demonstration of a Grid-Wide Measurement and Control Platform for Microgrid** sponsored by Department of Energy (DOE) – Brookhaven National Lab, Upton

**:** Demonstrate the usefulness and benefits of deploying smart grid sensor to manage a microgrid for improved efficiency, reliability, economy

**PV Generation Time Series and Impact Analysis Algorithms** sponsored by National Renewable Energy Laboratory (NREL) – Virginia Tech, Blacksburg

: Develop the algorithms used for PV generation time series and impact analysis

**Methods for High Penetration PV Studies** sponsored by National Renewable Energy Laboratory (NREL) – Virginia Tech, Blacksburg

: The modeling methods will analyze the impacts of high penetration PV interconnection

**Model-Based Renewable Resource Risk Assessment Analysis and Simulation** sponsored by Department of Energy (DOE) – Virginia Tech, Blacksburg

: Combine and extend existing technology and expertise to develop a model-based renewable generation risk assessment analysis and visualization system

**Simulating Distributed Energy Resource Technologies Impact Potential to Residential Network** sponsored by National Renewable Energy Laboratory (NREL) – Virginia Tech, Blacksburg

: Demonstrate integrated system model applications effectiveness in evaluating a variety of projected system impacts, allowing utilities to better address capacity planning, system reliability and operating efficiencies

**Load Modeling and State Estimation Methods for Power Distribution Systems** sponsored by EnerNex Corporation – North Carolina State University, Raleigh

: This project aims at the development of two new analysis tools (state estimator and load estimator) for the effective management of distribution system

**Graphic Man-Machine Interface (MMI) Development for Power System Analysis Package** sponsored by Korea Electric Power Research Institute (KEPRI) – ChungNam National University, Korea

**Development of Power Flow Analysis Software based on Graphics** supported by the Ministry of Commerce, Industry and Energy (MOCIE) – ChungNam National University, Korea

**System Integration and User Interface Development for Power System Simulator** supported by Korea Electric Power Research Institute (KEPRI) – ChungNam National University, Korea

**Three Phase Power Flow using Object-Oriented Programming in Distribution System** sponsored by Korea Electrical Engineering & Science Research Institute (KESRI) – ChungNam National University, Korea

**WORK EXPERIENCE**

**Assistant Professor – Ajou University, Suwon (Mar. 16 ~ Present)**

**Assistant Scientist – Brookhaven National Laboratory, Upton** (Apr. 14 ~ Feb. 16)

* Grid Integration of Renewable Energy Systems
* Renewable Energy Technologies Development and Deployment
* Smart Grid Development and Demonstration

**Engineer/Software Developer – Electrical Distribution Design, Blacksburg** (Aug. 09 ~ May. 14)

* Develop the power system simulation software (DEW software)

**Graduate Research Assistant – Virginia Tech, Blacksburg** (Aug. 09 ~ Present)

**Graduate Research Assistant – North Carolina State University, Raleigh** (Jan. 08 ~ Aug.09)

**Electrical Engineer – Bosch, Korea** (Jul. 06 ~ Aug. 07)

* Responsible for the maintenance of manufacturing equipment in a common rail system

**PUBLICATIONS - JOURNAL**

* ***Jaesung Jung***, Ahmet Onen, Kevin Russell, Robert P. Broadwater, Steve Steffel, Alex Dinkel, “*Configurable, Hierarchical, Model-based, Scheduling Control with Photovoltaic Generators in Power Distribution Circuits,*” Renewable Energy, vol. 76, pp. 318-329, Apr. 2015.
* ***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, vol. 43, pp. 569-583, Mar. 2015.
* ***Jaesung Jung*** and Robert P. Broadwater, “*Current Status and Future Advances for Wind Speed and Power Forecasting,*” Renewable and Sustainable Energy Reviews, vol. 31, pp. 762-777, Mar. 2014.
* ***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, vol. 66, pp. 532-540, Jun. 2014.
* ***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, vol. 108, pp. 218-235, Aug. 2013.
* ***Jaesung Jung*** and Kwa-Sur Tam, “*A frequency domain approach to characterize and analyze wind speed patterns*,” Applied Energy, vol. 103, pp. 435-443, Mar. 2013.
* Ahmet Onen, Danling Cheng, Reza Argandeh, ***Jaesung Jung***, Jeremy Woyak, Murat Dilek, and Robert P. Broadwater, “*Smart Model Based Coordinated Control Based on Feeder Losses, Energy Consumption, and Voltage Violations*”, Electric Power Components and Systems, vol. 41, pp. 1686-1696, Oct. 2013.
* Reza Arghandeh, Ahmet Onen, ***Jaesung Jung***, Robert P. Broadwater, “*Harmonic Interactions of Multiple Distributed Energy Resources in Power Distribution Networks*,” Electric Power Systems Research, vol. 105, pp. 124-133, Dec. 2013.
* 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 Systems Research, vol. 116, pp. 94-105, Nov. 2014.
* 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, vol. 62, pp. 712-717, Nov. 2014.
* Reza Arghandeh, Jeremy Woyak, Ahmet Onen, ***Jaesung Jung***, Robert P. Broadwater, “*Economic Optimal Operation of Community Energy Storage Systems in Competitive Energy Markets*,” Applied Energy, vol. 135, pp. 71-80, Dec. 2014.
* Ahmet Onen, ***Jaesung Jung***, Murat Dilek, Danling Cheng, Robert P. Broadwater, Charlie Scirbona, George Cocks, Stephanie Hamilton , and Xiaoyu Wang, *“Model-Centric Distribution Automation: Capacity, Reliability, and Efficiency”* submitted for publication in IEEE Transactions on Smart Grid.
* Ahmet Onen, Reza Arghandeh, ***Jaesung Jung***, Danling Cheng, Robert P. Broadwater, “*Model-Based Coordinated Control Energy Savings and Load Voltage Dependency*,” submitted for publication in IEEE PES Letter.

**PUBLICATIONS - CONFERENCE**

* Danling Cheng, Ahmet Onen, Reza Arghandeh, ***Jaesung Jung***, Robert Broadwater, and Charlie Scirbona, “Model centric approach for Monte Carlo assessment of storm restoration and smart grid automation,” in Proc. ASME 2014 Power Conference, Jul. 2014.
* 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*,” in Proc. ASME 2013 Power Conference, Jul. 2013.
* Ahmet Onen, Danling Cheng, Jeremy Woyak, Reza Arghandeh, ***Jaesung Jung***, and Robert P. Broadwater, “*Comparisons of Coordinated Control with Local Control: Feeder Losses, Energy Consumption, and Voltage Violations*,” accepted for publication in 4th IEEE International Conference on Power Engineering, Energy and Electrical Drives.
* Mancheol Shin, Chulwoo Park, ***Jaesung Jung***, Kernjoong Kim, Seongmin So, and Dongwan Seo, “*Nodal Admittance Modeling of Three-phase Step-Voltage Regulators and their Applications,*” in Proc. 2013 International Conference on Electrical Machines and Systems, Oct. 2013.
* ***Jaesung Jung***, Haukur Asgeirsson, Thomas Basso, Joshua Hambrick, Murut Dilek, Richar Seguin, and Robert Broadwater, “*Evaluation of DER Adoption in the Presence of New Load Growth and Energy Storage Technologies*,” in Proc. 2011 IEEE PES General Meeting, Jul. 2011.
* Mesut E. Baran, ***Jaesung Jung***, Thomas E. McDermott, “*Topology Error Identification Using Branch Current State Estimation for Distribution Systems*,” in Proc. 2009 IEEE T&D Asia, Oct. 2009.
* Mesut E. Baran, ***Jaesung Jung***, Thomas E. McDermott, “*Including Voltage Measurements in Branch Current State Estimation for Distribution Systems*,” in Proc. 2009 IEEE PES General Meeting, Jul. 2009.

**PUBLICATIONS - REPORT**

* Richard Seguin, Jeremy Woyak, David Costyk, ***Jaesung Jung***, Kevin Russell, and Robert Broadwater, “*Methods for High Penetration PV Studies*,” National Renewable Energy Laboratory (NREL), Report NREL LAT-2-11814-01, Aug. 2012.
* Robert Broadwater, ***Jaesung Jung***, Murat Dilek, and Bill Tolley, “*PV Generation Time Series and Impact Analysis Algorithms*,” National Renewable Energy Laboratory (NREL), Report NREL AAT-1-11764-01, Jul. 2011.

**HONORS AND AWARDS**

* **Government academic scholarship supported by Korean Ministry of Commerce, Industry and Energy (Fall 2007 ~ Spring 2009)**
* BK (Brain Korea) 21 national scholarships supported by Korean Ministry of Science and Technology (Spring 2003 ~ Fall 2004).
* ChungNam National University scholarship supported by ChungNam National University (Spring 1998 ~ Fall 2005)