BIOGRAPHICAL SKETCH

Born in Iran
B.S. 2008, Ahvaz University, Ahvaz, Iran
M.S. 2011, Tarbiat Modares University, Tehran, Iran
Ph.D. 2017, Florida Atlantic University, Boca Raton, Florida

CONCERNING PERIOD OF PREPARATION & QUALIFYING EXAMINATION

Time in Preparation: 2014—2017

Qualifying Examination Passed: Spring 2014

Selected Published Papers:

- H. Moradi, M. Esfahanian, A. Abtahi, and A. Zilouchian, "Modeling a Hybrid Microgrid Using Probabilistic Reconfiguration under System Uncertainties", *Energies*, 10(9), 1430, 2017.
- H. Moradi, A. Abtahi, and A. Zilouchian, "Optimization and energy management of a stand-alone hybrid microgrid in the presence of battery storage system", *Energy Journal*, Elsevier, 2017. (In press)
- H. Moradi, A. Abtahi, and D. D. Groff, "Optimal Energy Scheduling of a Stand-alone Multi-Sourced Microgrid Considering Environmental Aspects", *IEEE Innovative Smart Grid Technologies Conference*, Washington DC, 2017.
- H. Moradi, A. Abtahi, and R. Messenger, Annual Performance Comparison Between Two Solar Tracker and Fixed Grid-Tied Arrays, *43rd IEEE Photovoltaic Specialist Conference*, Portland, USA, June 2016.
- H. Moradi, A. Abtahi, and M. Esfahanian , Optimal Operation of a Multi-Sourced Microgrid to Achieve Cost and Emission Targets, *IEEE Power and Energy Conference at Illinois (PECI)*, pp. 1-6, Urbana, IL, 2016.

FAU

COLLEGE OF ENGINEERING & COMPUTER SCIENCE
Florida Atlantic University

FLORIDA ATLANTIC UNIVERSITY

COLLEGE OF ENGINEERING & COMPUTER SCIENCE

announces the

Ph.D. Dissertation Defense

of

HADIS MORADI

for the degree of

DOCTOR OF PHILOSOPHY (PH.D.)

Nov. 7, 2017 at 10 a.m.

in

Engineering East, Room 405

777 Glades Road

Boca Raton, FL

DEPARTMENT: Computer and Electrical Engineering and Computer Science

DISSERTATION TITLE: "Optimal Energy Scheduling of a Hybrid Microgrid Considering Environmental Aspects"

CHAIR OF THE CANDIDATE'S PH.D. COMMITTEE:
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ABSTRACT OF DISSERTATION

Optimal Energy Scheduling of a Hybrid Microgrid Considering Environmental Aspects

Lower costs of clean energy generation, the need for a more secure grid, and environmental concerns are leading to create more opportunities for integration of renewable energy resources utilization in the power systems. The recent concept of Microgrid (MG), as a part of the development of smart grid, is required to integrate the renewable sources in the utility grid. An MG is described as a small-scale distribution grid that consists of diversified Distributed Energy Resources (DERs), Battery Energy Storage Systems (BESSs), and local flexible loads that typically can either be operated in islanded or grid-connected modes. The optimal utilization control of such an MG system is a challenging task due to the complexity of coordination among the DERs, BESSs and load management possibilities. Therefore, in this thesis, optimal component sizing and micro-gas turbines, fuel cells, batteries and other dispatchable generating units.

Firstly, a methodology to perform the optimal component sizing for DERs in island/grid-tied modes is developed. The proposed optimal algorithm aims to determine the appropriate configuration among a set of components by taking into consideration the system's constraints. An Iterative optimization technique is proposed in order to minimize the annual cost of energy and cost of emissions including CO_2, SO_2, and NO_x. A case study is selected from South Florida area, and local weather data and load demand are employed in the modeling. Using the results from optimal component sizes, a day-ahead optimization problem for the operation of an MG under different scenarios is introduced. Also, the objective function is formulated as a constrained non-linear problem. The uncertainties of stochastic variables (solar radiation, wind speed, and load) are modeled using probabilistic models and renewable generations and load demand are forecasted for the next day. An advanced dynamic programming procedure is proposed to assess various operational policies. The simulation results show the efficiency of the proposed method.