

CONTACT
INFORMATION

Iowa State University
Electrical and Computer Engineering
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OBJECTIVE

A full-time position for a power system professional with interests in Power System Operations, Power Markets, Computational Optimization, Mathematical Modeling and Power System Software Development.

EDUCATION

Iowa State University, USA

Ph.D. Student, Electrical Engineering (expected May 2015)

- Advisor: Dr. Leigh Tesfatsion (Professor of Economics, Math and Electrical and Computer Engineering)
- GPA: 3.7/4.0

Iowa State University, USA

M.S., Electrical Engineering, Dec 2012

- Advisor: Dr. Leigh Tesfatsion and Dr. Dionysios Aliprantis
- Thesis: Residential Air-Conditioning System with Smart-Grid Functionality

SSN College of Engineering, Anna University, Chennai, India

B.E. in Electrical and Electronics Engineering, May 2010

- Final year project: Modeling, Simulation and Implementation of Five Phase Induction Machines and Drives

NIIT, Chennai, India

2 yr. course (ANIIT) in Software Engineering, Jan 2010

- Courses taken in C++, Java, SQL, C#, ASP.Net and UML

WORK/RESEARCH
EXPERIENCE**Ph.D. Intern, Pacific Northwest National Lab, May 2014-Aug 2014**

1. Work in three projects with the Demand Response and Distribution Systems group:
2. Future Power Grid Initiative: Wholesale-Retail power market integration with focus on the software framework and LSE demand bid formulation
3. Transactive Market for Ancillary Services: Modify GridLAB-D to include transactive market capabilities for regulation services using residential customers
4. GAMS project: Use GAMS to analyse and extend an economic dispatch model to include special capabilities

Graduate Teaching Assistant, Iowa State University, Spring 2014 & Fall 2014

1. Physics 111 (Department of Physics and Astronomy)
2. EE 303 (Department of Electrical and Computer Engineering)

Graduate Research Assistant, Iowa State University, Aug 2010-Present

1. Integrated Retail/Wholesale Power System Operation with Smart-Grid functionality
 - Extended an agent based test bed in Java to simulate the power market structure.
 - Developed an air-conditioning system controller to provide optimal inter-temporal comfort/cost trade-offs for the resident, conditional on anticipated retail energy prices.
 - To analyze the feedback loop that is established wherein the wholesale market prices affect the retail load (through the retail price) that in turn affects the wholesale market price (through Load Serving Entity [LSE] demand bids)
 - <http://www2.econ.iastate.edu/tesfatsi/irwprojecthome.htm>

2. Improved Power System Operations Using Advanced Stochastic Optimization (ARPA-E) [Mar 2012-Feb 2013]

- Extended the agent based test bed to include a stochastic unit commitment python package developed by Sandia National Laboratories.
- <http://arpa-e.energy.gov/?q=arpa-e-projects/probability-based-software-grid-optimization>

HONORS AND AWARDS

2008-09 SSN Merit Scholarship for securing 1st rank in Department of Electrical and Electronics Engineering, SSN, Chennai, India
2013 **Session Chair:** Coordinated Operation of Retail and Wholesale Power Markets (Panel Session), IEEE Power Energy Soc. Gen. Meet., Vancouver, British Columbia, Jul. 2013.

RELEVANT SKILLS

Languages: C, C++, Python, Java and SQL
HPC: MPI and OpenMP
Others: Matlab, CPLEX and GAMS.
Operating Systems: Windows, Linux (Ubuntu, Fedora and Redhat) and MacOS.

GRADUATE COURSEWORK

- Electromechanical Wind Energy Conversion
- Power System Planning
- Power System Dynamics
- Steady State Analysis
- Statistical Theory for Research Workers
- Numerical Analysis of High Performance Computing
- Linear Systems
- Optimal Control
- Optimization in Complex Systems
- Linear Programming
- Continuous Optimization
- Stochastic Programming

PEER-REVIEWED JOURNAL PUBLICATIONS

A. G. Thomas, P. Jahangiri, D. Wu, C. Cai, H. Zhao, D. C. Aliprantis, and L. Tesfatsion, "Intelligent residential air-conditioning system with smart-grid functionality," *IEEE Trans. Smart Grid (Special Issue on Intelligent Buildings and Home Energy Management in a Smart Grid Environment)*, Vol. 3, No. 4, pp. 2240–2251, Dec. 2012

CONFERENCE PUBLICATIONS

A. G. Thomas, C. Cai, D. C. Aliprantis, and L. Tesfatsion, "Effects of price-responsive residential demand on retail and wholesale power market operations," in *Proc. IEEE Power Energy Soc. Gen. Meet.*, San Diego, CA, Jul. 2012.

H. Zhao, **A. G. Thomas**, P. Jahangiri, C. Cai, L. Tesfatsion, and D.C. Aliprantis, "Two-settlement electric power markets with dynamic-price customers," in *Proc. IEEE Power Energy Soc. Gen. Meet.*, Detroit, MI, Jul. 2011.

C. Cai, P. Jahangiri, **A. G. Thomas**, H. Zhao, D. C. Aliprantis, and L. Tesfatsion, "Agent-based simulation of distribution systems with high penetration of photovoltaic generation," in *Proc. IEEE Power Energy Soc. Gen. Meet.*, Detroit, MI, Jul. 2011.

REFERENCES

Leigh Tesfatsion

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- Associate Professor, Department of Electrical Engineering
- Purdue University
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