

Edwin Lee

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OBJECTIVE

To leverage my skills as a proficient programmer, mechanical engineer, and numerical analyst in the field of advanced building and system simulation.

EDUCATION

Doctor of Philosophy, Mechanical Engineering

Oklahoma State University, Stillwater, OK May 2013

THESIS - A Generalized Pipe Heat Transfer Model for Whole Building Simulation Applications

GPA 4.00

Master of Science, Mechanical Engineering

Oklahoma State University, Stillwater, OK May 2008

THESIS - Development, Implementation, and Verification of a Buried Pipe Model in EnergyPlus

GPA 4.00

Bachelor of Science, Mechanical Engineering

Oklahoma State University, Stillwater, OK May 2006

GPA 3.52

ENGINEERING EXPERIENCE

Research Engineer May 2013 – Present

National Renewable Energy Laboratory, Golden, CO

- Contributed to the Technology Performance Exchange (TPEX) via Data Entry Form development, dataset processing, and development of the logic and scripts to convert TPEX datasets into components on the Building Component Library
- Began leading technical development of EnergyPlus, overseeing the technical changes accompanying the translation from FORTRAN to C++, and StarTeam to GitHub

Graduate Assistant January 2006 – May 2013

Oklahoma State University, Stillwater, OK

- A complete re-write of the EnergyPlus central plant simulation, including solution algorithms, pump model re-work, and updating component model design
- Developed a generalized horizontal ground heat exchanger model that includes interaction with a basement zone, specifically for use with foundation heat exchangers
- Performed experimental measurement and modeling of transport delay phenomena in piping systems
- Worked closely with the Center for the Built Environment at University of California, Berkeley, providing simulation support for Underfloor Air Distribution System research with EnergyPlus

Engineering Consultant Fall 2007, Summer 2009

Oak Ridge National Laboratory, Oak Ridge, TN

- Utilized EnergyPlus to investigate wall constructions for residential applications
- Constructions included frame walls, solid wood walls, and phase change materials

Engineering Intern Summer 2005

Specific Systems, Tulsa, OK

- Introduced to design and manufacturing of modular HVAC equipment
- Designed and fabricated parts
- Performed various mechanical and structural analysis on designs
- Aided in the construction of a thermal test chamber

COMPUTER SKILLS

- Proficient with Windows and Linux Operating System Environments
- Scripting Languages: Batch (Windows), Bash (Linux), Python, Ruby
- Programming Languages: FORTRAN, C, C++, VB.Net, VBA, Modelica, (Including Language Interop)
- GUI Development: VB.Net (Windows), Python (Cross-platform)
- Other software tools:
 - Office suites, including LibreOffice and MS Office, Gnumeric
 - Software version control tools, including Borland Starteam, Git, Subversion, and Bazaar
 - Publication tools, including LaTeX and GnuPlot
 - Software Tools, including EES, MathCAD, R, Fluent, AutoCAD, LibreCAD and Octave (Matlab)
 - Virtual machine utilization

ENERGYPLUS DEVELOPMENT

- Generalized buried pipe heat transfer model
- Plant pressure algorithms
- Central plant solver overhaul
- Development of a new testing framework
- Overseeing technical efforts for Fortran to C++ translation and StarTeam to GitHub transition

PUBLICATIONS

- Raftery, P., E. Lee, T. Webster, T. Hoyt and F. Bauman. 2014. *Effects of furniture and contents on peak cooling load*. Energy and Buildings: 85:445-457.
- Studer, D., K. Fleming, E. Lee and W. Livingood. 2014. *Enabling Detailed Energy Analyses via the Technology Performance Exchange*. Proceedings of the ACEEE Summer Study, Pacific Grove, CA, USA.
- Lee, E., D. Fisher and J. Spitler. 2013. *Efficient Horizontal Ground Heat Exchanger Simulation with Zone Heat Balance Integration*. HVAC&R Research: 19(3):307-323.
- Lee, E. and D. Studer. 2013. *TIP 287: Reducing Technology Evaluation Costs Through a Technology Performance Exchange. Deliverable 2.5: Draft Data Entry Forms*. NREL Report No. TP-5500-60219.
- Xiong, Z., E. Lee and D. Fisher. 2013. *Development of a Horizontal Slinky Ground Heat Exchanger Model*. ASHRAE Transactions: 119(2).
- Chandrasekharan, R., E. Lee, D. Fisher and P. Deokar. 2013. *An Enhanced Simulation Model for Building Envelopes with Phase Change Materials*. ASHRAE Transactions: 119(2).
- Cullin, J., Spitler, J. and E. Lee. 2013. *Preliminary Investigation of the Effect of Horizontal Piping on the Performance of a Vertical Ground Heat Exchanger System*. ASHRAE Transactions: 119(2):302-311.
- Webster, T., T. Hoyt, E. Lee, A. Daly, D. Feng, F. Bauman, S. Schiavon, K. Ho Lee, W. Pasut and D. Fisher. 2012. *Influence of Design and Operating Conditions on Underfloor Air Distribution (UFAD) System Performance*. Proceedings of Simbuild 2012, August 1-3, Madison, Wisconsin.
- Cullin, J.R., L. Xing, E. Lee, J.D. Spitler and D.E. Fisher. 2012. *Feasibility of Foundation Heat Exchangers In Ground Source Heat Pump Systems In the United States*. ASHRAE Transactions: 118(1):1039-1048.
- Kony, J., D. Yarbrough, W. Miller, P. Childs, J. Atchley, S. Shrestha, E. Kossecka, J. B. Smith, T. Fellingner, E. Lee, and M. Bianchi. 2010. *Theoretical and Experimental Thermal Performance Analysis of Building Shell Components Containing Blown Fiberglass Insulation Enhanced with Phase Change Material (PCM)*. Proceedings of ASHRAE THERM XII, Clearwater, FL.
- Spitler, J., J. Cullin, M. Bernier, M. Kummert, P. Cui, X. Liu, E. Lee, and D. Fisher. 2009. *Preliminary inter-model comparison of ground heat exchanger simulation models*. Proceedings of 11th International Conference on Thermal Energy Storage; Effstock 2009, Stockholm, Sweden.
- Cremaschi, L., and E. Lee. 2008. *Design and Heat Transfer Analysis of a New Psychrometric Environmental Chamber for Heat Pump and Refrigeration Systems Testing*. ASHRAE Transactions 114(2):619-631.