

RESEARCH SCIENTIST

Profile

Core expertise in thermal sciences and fluid mechanics with specialties in advanced energy harvesting and energy storage technologies. Additional skills include automated metering technologies for the smart grid.

Skills

- Programming Languages -- C, C++, C#, Java, VBA, Python, FORTRAN, ADA 95, G-Code, Flash
- Hardware -- GPIB, VXI, RS422, RS232, Mil-STD-1553, PIC Microcontrollers, Atmel Atmega 128/256, Bluetooth, ZigBee, Chipcon Radios, Sun SPOT, Moteiv, Arduin o
- Applications -- ANSYS/FLUENT, MATLAB, PTC Mathcad, Mathematica, SPSS, Maple, Multisim, NI LabVIEW, RS Logix 5000, MS Office, MS Project, COMSOL, HyperMesh, Gmsh, ABAQUS, Strand7, R, Octave, OpenFOAM, getFEM++, eQUEST, DOE-2.2, Trace 700, HAP 3.4, Primavera Linux, Mac OS
- Machining -- CNC (mill, lathe), manual lathe and milling operations,
- Technical Drawing -- AutoCAD, Revit, Pro-E, SolidWorks, PhotoShop
- Editor Tools -- LaTeX, Vim, Emacs, Nano Data
- Visualization Tools -- SigmaPlot, ParaView, gnuplot, Tecplot Operating Systems -- Windows,

Professional Experience

Research Scientist Jan 2012 to Jan 2015

Beaumont Hospitals 1/4 Sterling Heights , MI

- Heat transfer phenomena study in macro and micro/nano-scale systems
- Laser processing of thin and thick films Design and fabrication of thermoelectric generators
- Thermoelectric-based energy harvesting systems for small modular reactors
- Multi-physics modeling of laser-metal interaction involving ablation and melting
- Femtosecond laser processing of metals and ceramics
- Laser sintering based additive manufacturing techniques for energy harvesting applications
- Developing novel 3D printing methods for functional materials.

Research Assistant Jan 2010 to Jan 2012

Marcus And Millichap 1/4 Reno , NV

- Automated meter reading (AMR) and non-intrusive appliance load monitoring (NIALM) systems for residential natural gas meters
- Developed an algorithm for the efficient discovery of recurrent routine behaviors in smart meter time series data
- Advanced high-resolution automated meter reading and load disaggregation techniques.

Mechanical Design Engineer Jan 2007 to Jan 2010

Lockheed Martin 1/4 Valencia , CA

- Mechanical system design for various commercial, institutional, educational and residential buildings
- Field survey and supervision on existing building systems and new installations
- Building energy simulation calculations for better energy management
- In-depth knowledge of International Building Code and ASHRAE 62.1-2007 standard
- Designed a co-generation power plant for a building at 120 Broadway St. that would reduce building operational costs by 35%
- Designed ISO 797 certified mechanical systems for a pharmaceuticals and hospitals
- Designed state of the art data center cooling system
- Commissioning of mechanical system installations.

Structural Engineer Intern Jan 2006 to Jan 2007

Applied Research Associates, Inc. 1/4 Baton Rouge , LA

- Drafting design projects of a wide range of building types including high-rise, schools, stadiums, etc.
- Production and coordination of drawings from concept design through schematic design, detail design and tender.

Education and Training

Ph.D , Mechanical Engineering 2015 Stony Brook University Mechanical Engineering

M.S , Mechanical Engineering 2012 Stony Brook University Mechanical Engineering

B.E , Mechanical Engineering 2008 State University of New York, Maritime College Mechanical Engineering

Affiliations

- Institute of Electrical Electronic Engineers (IEEE), 2010 - Present
- American Society of Mechanical Engineers (ASME), 2005 - Present American Society of Heating and Refrigeration Engineers (ASHARE) 2005 - Present
- National Society of Black Engineers (NSBE), 2004 - Present

- Alpha Phi Alpha Fraternity, Inc. 2004- Present

Publications

- Tewolde, M., Hwang, D., Longtin, J.P., "Laser Processing of Multi-layered Thermal Spray Coatings for Thermoelectric Generator Device Fabrication" Journal of Electronic Materials (in preparation)
- Tewolde, M., Fu, G., Hwang, D., Zuo, L., Sampath, S. Longtin, J.P., "Thermoelectric Device Fabrication using Thermal Spray and Laser Micromachining" Journal of Therm. Spray Technology, pp. 1-10, 2015/12/03 2015.
- Tewolde, M., Fritch, J.C., Longtin, J.P. Longtin, "Design of a low -cost, high-resolution retrofit module for residential natural gas meters" Applied Thermal Engineering, 75, pp. 357 -365. (2014)
- Tewolde, M., Lin, C.C., Tao, H., Chen, H., Fu, G., Liu, D., Zhang, T., Benjamin, D., Zuo, L., Hwang, D., Longtin, J. "Sensors for Small Modular Reactors powered by thermoelectric generators", ASME 2014 Small Modular Reactors Symposium, SMR 2014
- Tewolde, M. and Longtin, J.P., "High-Resolution Automated Gas Meter Reading and Load Disaggregation," Applied Energy, 108, Pages 363-372 (2013) Longtin, J.P., Zuo, L., Hwang, D., Fu, G.,
- Tewolde, M., Chen, Y., Sampath, S., "Fabrication of thermoelectric devices using thermal spray: application to vehicle exhaust systems" Journal of Therm. Spray Technology, 22, 577-587. 2013. Fu, G., Zuo, L., Longtin, J. P., Nie, C., Chen, Y,
- Tewolde, M. and Sampath, S., 2013, "Thermoelectric Properties of Magnesium Silicide Deposited using Atmospheric Plasma" Journal of Electronic Materials, April 2013.
- Longtin, J.P., and Tewolde, M., 2011, "High Resolution Automated Meter Reading System for Natural Gas Meters," Metering International, Issue 1, pp. 84-89.

Additional Information

- Research Assistantship, Stony Brook University, 2010-2015
- Best poster Award, Stony Brook University, 2012, 2014
- Best poster Award, CEWIT conference, 2013
- ASME Regional Competition Award, 2008
- Admirals List, S.U.N.Y Maritime College, 2005-2008

Skills

ADA, PhotoShop, ANSYS, art, AutoCAD, C, C++, Hardware, CNC, concept, Data Visualization, Drafting, Editor, energy management, Flash, FORTRAN, functional, Drawing, ISO, Java, LabVIEW, Laser, lathe, Linux, Machining, Mac OS, Maple, materials, Mathcad, Mathematica, MATLAB, Mechanical, C#, MS Office, MS Project, Windows, mill, modeling, natural gas, novel 3, Operating Systems, physics, Primavera, Pro-E, Programming, Python, reading, Revit, simulation, SolidWorks, SPSS, Sun, supervision, system design, tender, VBA