

GLADYS A. ANYENYA

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EDUCATION

Colorado School of Mines, Golden, CO Doctor of Philosophy in Mechanical Engineering Dissertation Title: Solid-Oxide Fuel Cells for Unconventional Oil and Gas Production	May 2017 GPA: 3.85/4.0
Colorado School of Mines, Golden, CO Master of Science in Mechanical Engineering	December 2015 GPA: 3.85/4.0
Hillsdale College, Hillsdale, MI Bachelor of Science in Physics and Mathematics (Magna cum laude)	May 2012 GPA: 3.73/4.0

SKILLS

Computer: AMPL, CPLEX, ANSYS Fluent, ASPEN Plus, MatLab, Wolfram Mathematica, Tec-plot 360, EES, LaTeX, Microsoft Excel, Word, PowerPoint, Access, Outlook, Adobe Illustrator, Photoshop
Laboratory: LabVIEW and data acquisition systems; Gas analyzers such as mass spectrometer, gas chromatograph; SOFC testing and characterization
Communication: Oral presentations–Technical conferences and corporate presentation; Technical writings – Peer reviewed journal publications, testing reports, cross-disciplinary partnerships

RESEARCH EXPERIENCE

Research Assistant, Colorado Fuel Cell Center January 2013 - Present
Colorado School of Mines Golden, CO

Design, experimental testing, computational modeling and techno-economic optimization of a Geothermic Fuel cell (GFC) system that seeks to utilize the combined heat and power from high temperature solid oxide fuel cells in the liberation of oil and gas from oil shale.

- Developed, calibrated and validated computational models to simulate GFC system operation and its interaction with the surrounding geology, incorporating:
 - Solid-oxide fuel cell electrochemical performance model
 - Heat transfer between components in the GFC module
 - Auto-thermal fuel reformer performance, compressor and reactant pre-heater sizing
- Acquired, processed and interpreted experimental data during prototype testing and communicated findings and recommendations for prototype improvements
- Numerically explored GFC-geology coupling over a broad range of operating windows to establish an optimum operating condition for oil shale conversion
- Developed a non-linear optimization model in AMPL that seeks to minimize the system cost and maximize system efficiency
- Authored peer-reviewed journal articles, conference papers and project reports to our industry partners

Student Researcher, Hillsdale College President's Office May 2010 – August 2012
Hillsdale College Hillsdale, MI

- Researched and compiled bibliographies for the college president's speeches, articles and books
- Managed office correspondence by scanning into the system for distribution to the appropriate departments

TEACHING EXPERIENCE

Graduate Teaching Assistant, Mechanical Engineering Department August 2012- December 2012
Colorado School of Mines Golden, CO

- Led recitations in Introductory Fluid Mechanics
- Held office hours to offer supplemental tutoring sessions to undergraduate students

Teaching Assistant, Physics Department August 2011- May 2012
Hillsdale College Hillsdale, MI

- Prepared and delivered pre-lab lectures to demonstrate use of laboratory equipment
- Prepared, administered and graded examinations, lab reports and assignments
- Assisted in class sessions and held tutoring sessions

RELEVANT COURSES

Linear Optimization, Non-linear Optimization, Fluid Mechanics, Heat Transfer, Advanced Engineering Measurements, Design and Simulation of Thermal Systems, Thermodynamics, Introduction to Computational Techniques for Fluid Dynamics and Transport Phenomena, Advanced Heat Transfer, Fuel Cell Science and Technology, Advanced Engineering Analysis, Electrochemical Systems Engineering, Combustion, Viscous Flow and Boundary Layers (Advanced Fluid Mechanics), Engineering Design Optimization

PEER-REVIEWED PUBLICATIONS

- N. Sullivan, G. Anyenya, B. Haun, M. Daubenspeck, J. Bonadies, R. Kerr, B. Fischer, A. Wright, G. Jones, R. Li, M. Wall, A. Forbes, M. Savage, In-Ground Operation of Geothermic Fuel Cells for Unconventional Oil and Gas Recovery. *Journal of Power Sources* 302 (2016) 402–409.
- G. Anyenya, B. Haun, M. Daubenspeck, R. Braun, N. Sullivan, Experimental Testing of a Novel Kilowatt-Scale Multi-stack Solid-Oxide Fuel Cell Assembly for Combined Heat and Power. *Journal of Electrochemical Energy Conversion and Storage* 13 (2017).
- G. Anyenya, N. Sullivan, R. Braun, Modeling and Simulation of a Novel 4.5 kWe Multi-Stack Solid-Oxide Fuel Cell Prototype Assembly for Combined Heat and Power. *Energy Conversion and Management* 140 (2017) 247–259.
- G. Anyenya, R. Braun, N. Sullivan, A. Newman, Design and dispatch optimization of a Solid-Oxide Fuel Cell Assembly for Unconventional Oil and Gas Production. In preparation for submission to *Optimization and Engineering*.
- G. Anyenya, A. Newman, N. Sullivan, Solid-Oxide Fuel Cell applications in unconventional oil and gas recovery. In preparation for submission to *Journal of Petroleum Science and Engineering*.

CONFERENCE PRESENTATIONS

- G. Anyenya, R. Braun, N. Sullivan, A. Newman, Geothermic Fuel Cells: A Novel Application of Solid-Oxide Fuel Cells for Unconventional Oil and Gas Recovery. *INFORMS Annual Meeting*, Nashville, TN 2016, 15 November.
- G. Anyenya, R. Braun, N. Sullivan, A. Newman, Geothermic Fuel Cells: A Novel Application of Solid-Oxide Fuel Cells for Unconventional Oil and Gas Recovery. Minority Issues Forum Poster Session at *INFORMS Annual Meeting*, Nashville, TN 2016, 13 November.
- G. Anyenya, B. Haun, M. Daubenspeck, R. Braun, N. Sullivan, Geothermic Fuel Cells: A Novel Application of Solid-Oxide Fuel Cells for Unconventional Oil and Gas Recovery. *ASME 14th Fuel Cell Science, Engineering & Technology Conference*, Charlotte, NC 2016, 28 June.
- G. Anyenya, B. Haun, M. Daubenspeck, R. Braun, N. Sullivan, Thermo-electrical Model and SOFC System Demonstration For Geothermic Fuel Cell Heater Application. *8th Annual Energy Africa Conference*, Golden, CO 2015, 29 October.
- G. Anyenya, B. Haun, M. Daubenspeck, R. Braun, N. Sullivan, Electrochemical- and Thermal-Performance Model of a High-Temperature SOFC System for Geothermic Fuel Cell Application. *ASME 2014 12th International Conference on Fuel Cell Science, Engineering and Technology*, Boston, MA 2014, 01 July.
- G. Anyenya, B. Haun, M. Daubenspeck, N. Sullivan, R. Braun, Model of a High Temperature Solid Oxide Fuel Cell System For Geothermic Fuel Cell Application. *Conference on Earth and Energy Research*, Golden, CO 2014, 28 February.

HONORS AND PROFESSIONAL AFFILIATIONS

- Honorable Mention, Minority Issues Forum poster competition at INFORMS Annual Meeting, 2016
- Member of the Institute for Operations Research and the Management Sciences (INFORMS), 2016–present
- Member of the Society for Industrial and Applied Mathematics (SIAM), 2016–present
- Member of the American Society of Mechanical Engineering (ASME), 2013–present
- Member of the Society of Women Engineers (SWE), 2013–present
- Zawadi Africa Education Fund Scholar, 2008–present
- Graduate Student Government Continuance Fellowship, Colorado School of Mines, 2016–2017
- International Scholarship and E. Ross Adair Scholarship Awards, Hillsdale College, 2008–2012
- All-Academic Track & Field Honors, Great Lakes Intercollegiate Athletic Conference (GLIAC), 2009–2011

ACTIVITIES AND INTERESTS

The Invictus Initiative – Vice President of Programs, Africa
Graduate Student Government, Colorado School of Mines – Director of Graduate Experience Mentoring Program
Denver Alumnae Association, Kappa Kappa Gamma – Book & Author Dinner Organizing Committee
Marathon running, snowboarding, rock climbing, cycling, and traveling