Christopher Frewin

Ph.D. Candidate

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Research Interests

Construction of creative tools for automated chemical reduction and other chemical mechanism analyses to provide detailed insight into combustion processes and chemical kinetics at large, focusing especially on leveraging advanced statistical and numerical algorithms to make these tools powerful yet efficient.

Education

Cornell University, Ithaca, NY, USA. *May 2019 (Expected)*
Ph.D. in Mechanical Engineering
Minor in Computer Science
Advisor: Professor Perrine Pepiot

Cornell University, Ithaca, NY, USA. *May 2016 (Expected)*
M.S. in Mechanical Engineering
Advisor: Professor Perrine Pepiot

Clarkson University, Potsdam, NY, USA. *May 2014*
B.S. in Mechanical Engineering with Honors and Great Distinction
Advisor: Professor Suresh Dhaniyala

Clarkson University, Potsdam, NY, USA. *May 2014*
B.S. in Physics with Great Distinction
Advisors: Professor David Wick, Professor Michael Ramsdell

Professional Experience and Activities

Cornell University Graduate Fellow *October 2014 – May 2019*
The Sibley School of Mechanical and Aerospace Engineering at
Cornell University provides five years of full funding for Ph.D. students.

Graduate Research Assistant *October 2014 – May 2019*
Pepiot Research Group, Mechanical Engineering, Cornell University
Development of molecular structure tracing schemes for biofuel blends.
Optimization of emissions reduction for petroleum-biofuel blends.

Lead Technical Engineer for Right Price Managment LLC *February 2015 – Present*
Creating Airbnb and hotel databases from online APIs for a Cornell-based
startup that provides detailed pricing, analytics, and sentiment
analysis for airbnb property owners.

Member of Johnson Energy Club *September 2014 - Present*
Johnson Graduate School of Management, Cornell University
The Johnson Energy Club is comprised of highly motivated
students who are passionate about making an impact in the
energy industry. The interests of the club span both conventional
and renewable energy, and are spread across various functional
areas including but not limited to: sales and trading, managerial
finance, consulting, investment banking, marketing, and entrepreneurship.

Member of the Ithaca Chapter of the Citizen's Climate Lobby *November 2014 - Present*
Citizens Climate Lobby proposes that a fee be placed on
fossil fuels, based on the CO_2 content of those fuels. Revenue
from that fee would be returned to the public as a monthly dividend
to protect households from rising costs associated with the carbon fee.
Ithaca, NY, USA

Writer and Member of Student Energy Energy Literacy Platform *October 2014*
Wrote two articles to be used to educate students across the country.
Topics written for were "Biofuels" and "Renewable Energy".
http://www.studentenergy.org
Ithaca, NY, USA

Undergraduate Research Assistant (Thesis) *October 2012 – May 2014*
Dhaniyala Research Group, Mechanical Engineering, Clarkson University
Modeling, design, and fabrication of an electrostatic particulate filter
scaled for diesel vehicles, design to capture diesel soot exhaust.

Undergraduate Research Assistant (Payed Research Assistant) *October 2013 – May 2014*
Kheim Tran, Mechanical Engineering, Clarkson University
Developed user interface to a finite element solver of ground penetrating
radar (GPR) simulations.

Honors, Awards, and Fellowships

Spark Clean Energy Fellow *October 2014 – March 2015*
Selected as one of 16 fellows from a national pool of applications.
Three other fellows and I to created and a career accelerator
for students to gain internship positions at clean
energy companies the summer of 2015.
http://www.sparkcleanenergy.org/chris-frewin.html

Austrian Marshall Plan Scholar *February 2012 – August 2012*
Academy of Applied Sciences Upper Austria
http://www.marshallplan.at/index.php/features Wels, Austria

Recipient of a NSF Stipend through Grant #OISE-1065179 *May 2011 – August 2011*
Chinese Academy of Sciences Institute of Physics
Funded by partnership of the National Science Foundation, Corning Incorporated,
and the Center for Advanced Material Processing at Clarkson University.
http://web2.clarkson.edu/projects/reushen/ires_china Beijing, China

Sole Proprietorship

Owner and Founder of Siren Apparel *Fall 2011*
Startup clothing company that donates all profits to firefighters and police officers.
www.sirenapparel.us
Saratoga, NY

Donations:
$50 donated each to:
The Baltimore Police Department
California Department of Forestry and Fire Protection
The City of Norman Fire Department
The Utah County Fire Department
The Texas Wildfire Fund

Other Recognition:
$500 awarded as third place winner at the North Country *Winter 2013*
Regional Business Plan Competition
Potsdam, New York

$2,038 raised through Rock The Post Crowdfunding campaign. *Fall 2012*
www.rockthepost.com (now merged with www.onevest.com)

Finalist for New York State Business Plan Competition *April 2012*
Albany, New York

Finalist for Raymond Von Drann Entrepreneurship Contest *April 2012*
Syracuse, New York

A member of the www.rockthepost.com startup database *September 2014*

Publications

Conference Proceedings

Laurent, C. Frewin, C. Narayanaswamy, K., and Pepiot, P. "Numerical tracers to investigate soot formation in multi-component fuel combustion" Paper to be presented at the 9th U.S. National Combustion Meeting, Cincinnati, Ohio

Undergraduate Publications

Frewin, C. A New Electrostatic Precipitator for Filtration of Diesel Vehicle Particulate Emissions: Design, Experiments, and Modeling, Clarkson University Honors Program Thesis (2014): 1-35.

Frewin, C., Literature Review and Implementation of Parameter Identification Methods for Multibody Systems Governed by Differential Algebraic Equations, Marshall Plan Foundation, 2013, 1-47 http://www.marshallplan.at/images/papers_scholarship/2013/Frewin.pdf.

Frewin, C., Experimental Study of the Coefficient of Restitution for Low Velocity Normal Impacts, (eds. Hayley Shen, Yongming Liu, SV Babu), International Research Experience for Students: Advanced Materials for a Sustainable Development, 2011 Report, 20-33.

Conferences

Presentations

16th Annual Spring Symposium on Undergraduate Research Experiences (SURE) *April 2014*
Poster title: "Diesel Electrostatic Particulate Filter:
Design, Experiments, and Modeling"
Awarded best presentation in environmental chemistry
Clarkson University, Potsdam, NY

Posters

Environmental Monitoring, Evaluation, and Protection (EMEP) Conference *November 2013*
Poster title: "Development of a New Electrostatic Diesel Particulate Trap"
Albany, NY

Institute for a Sustainable Environment Poster Presentation *February 2013*
Poster title: "Development of a New Electrostatic Diesel Particulate Trap"
Clarkson University, Potsdam, NY

14th Annual Spring Symposium on Undergraduate Research Experiences (SURE) *April 2012*
Poster title: "Diesel Electrostatic Particulate Filter"
Clarkson University, Potsdam, NY

Other Conferences Attended

MIT Energy Conference *February 2015*
Cambridge, MA
Attended as part of the Spark Clean Energy Fellowship.

ARPA-E Energy Innovation Summit *February 2015*
Washington, DC
Selected for 1 of 100 complimentary student tickets to the ARPA-E conference.

Berkeley Energy and Resources Collaborative Energy Summit *October 2014*
Berkeley, CA
Attended as part of the Spark Clean Energy Fellowship.

Symposium on Energy in the 21st Century *April 2014*
"Renewable Energy: What Do We Expect in the Next Ten Years?"
Syracuse, NY

Graduate Courses Taken

Cornell University
Data Science Tech Trek and Hackathon (NBA6029)
    Weekend-long course included 26 hour hackathon and panels
    from CEOs of five data science companies and startups
    with students from Cornell, MIT, Columbia, and NYU.
Chemical Kinetics & Transport (CHEME7130)
Turbulence and Turbulent Flows (MAE6310)
Unix Tools and Scripting (CS2043)
Combustion Processes (MAE5430)
Computational Fluid Dynamics (MAE6230)
Electrical Power Systems (CHEME6672)

Clarkson University
Experimental Aerosol Mechanics & Instrumentation (ME538)

Teaching

Teaching Assistant, Cornell University *Fall 2014*
ENGRD 2210 - Thermodynamics.
Generating and solving homeworks, planning test times, teaching recitation once a week and holding office hours twice a week.

Writing Tutor, Clarkson University *September 2011 – October 2013*
Clarkson University Writing Center
Assisting student of all backgrounds on all types of writing assignments.

Physics Tutor, Clarkson University *Spring 2012*
PH 132 - Physics II.
Advanced honors freshman lab course in electromagnetism.

Physics Tutor, Clarkson University *Fall 2011*
PH 131 - Physics I.
Advanced honors freshman lab course in classical mechanics.

Internships

General Electric Transportation *May 2012 – August 2012*
Locomotive Diesel Engine Manufacturing Plant
Grove City, PA

Deliverables Completed:

1. Diesel Turbo Seal Re-use Program
Developed Design Failure Mode and Effect Analysis (DFMEA) for the Six Sigma manufacturing process of diesel turbine seals.
Gave a 535 produce - GE's secondary review process in front of group of lead engineers.
Gave a 560 produce - GE's tertiary and final review process in front of group of lead engineers.

2. FDL Diesel Engine Fuel Valve Block Re-Use
Created value story and discovered savings of nearly $100 per fuel valve block.

3. In-House Thermal Spray Project and Presentation
Defined and presented validation requirements for bringing an existing process in house.

4. Turbo Light Work Scope Development
Completed detailed DFMEA for entire turbo system for the locomotive diesel engine.